



# Extracting value -Yukon mining 2011 A core opportunity

Yukon is the #1 first world jurisdiction for the likely discovery and development of multiple worldclass gold deposits.

- CEO Survey Respondent (2011)

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### Foreword

Mining exploration, development, and production activity in Yukon soared in 2011. Exploration and drilling activity, commercial production, revenue, and taxation figures all showed dramatic increases over the prior year. However, much has changed since 2009 and 2010. While the facts and figures made available for these two years show significant growth, it is important to look forward to understand how that growth is expected to continue. Yukon must be prepared to embrace its new position on the global stage as an emerging area for the identification and development of significant new mining projects. In order to advance projects on schedule, all stakeholders need to collaborate to ensure that additional sustainable infrastructure is developed, that the environment is protected for future generations and that residents clearly understand the long-term benefit associated with mining activity in Yukon.

This report highlights key statistics on Yukon mining activity for 2009 and 2010 together with survey responses of mining company CEOs (hereinafter referred to as the "CEO survey") having properties in Yukon. The CEO survey was an online questionnaire seeking to gain insight into the outlook for the industry and the biggest challenges facing Yukon exploration, development and production. Based on the CEO survey, and the key insights of Deloitte's Mining practice in Vancouver, we have attempted to identify the key strengths, opportunities, and hurdles to overcome for all stakeholders in the future of Yukon mining.



The purpose of Deloitte's 2011 Yukon Mining Report is to develop a baseline dataset, explore initial insights, strengths and opportunities for Yukon to realize its potential as a world-class mining district and to build a deeper understanding of where CEOs of Yukon's mining companies have been focusing their energy in order to further unlock shareholder value.

Through an online survey and questionnaire sent to the CEOs of companies with properties in Yukon, Deloitte received 31 responses. The survey responses have revealed key strategic and operational opportunities, and decisions, that will prove crucial to further enhancing their company's value.

Released in association with the Yukon Chamber of Mines, this report also includes Deloitte commentary and insight related to the mining sector in Yukon.

The government cannot continue to wait on the side lines while the mining industry spends significant dollars. It must be proactive, improve road access, and watch Yukon really boom.

- CEO Survey Respondent (2011)

### History repeating itself

Yukon has a rich mining history. Mining has continued to be the cornerstone of the Yukon economy from the famous Klondike gold rush of 1896 to 1898, to present day, although the territory has experienced several "boomand-bust" cycles as metal prices have risen and fallen over the years.

The first reported exploitation of metals in Yukon pre-dates European settlement in Canada. Yukon First Nations are known to have mined copper nuggets in the White River area of southwest Yukon to fashion arrowheads and to trade. Prospecting for placer gold by settlers began soon after the first reported discovery at Fortymile in 1850.

The discovery of gold on Rabbit Creek in the Klondike district by George Carmack, Tagish (Dawson) Charlie and Skookum Jim on August 16, 1896 sparked the world's biggest "gold rush." Placer gold mining remained the mainstay of Yukon's economy from the time of the gold rush, until the early 1920s. Following rises in the price of gold, placer mining was again important from the 1940s to the 1960s, as well as from 1974 to today. The total recorded fine gold production from 1885 to date is estimated at 12.5 million ounces. This is valued at US\$4.4 billion at today's prices.

High-grade silver/lead veins were first discovered in the Keno Hill area in 1906. The first mill was constructed in

1925, with intermittent development and production until 1941. The mines were reactivated in 1945 and operated more or less continuously until production was suspended in January 1989 due to low silver prices. The total recorded production from 1906 to 1989 was more than 200 million ounces of silver, making it the second largest silver producer district in Canada.

Skarn copper mineralization was first discovered in the Whitehorse area in 1897. Shipments of high-grade ore prior to 1930 totaled 153,000 tonnes. Following extensive exploration in the 1950s and 1960s, an 1,800 tonneper-day mill was constructed in 1966 and open-pit mining followed. Total production from 1967 to 1982 is estimated at 123,000 tonnes of copper, 90 tonnes of silver and 7 tonnes of gold from 10.3 metric tonnes of ore, valued at US\$1.4 billion at today's prices.

Massive sulphide zinc/lead/silver mineralization was first discovered near Vangorda Creek in the Anvil Range in 1953. The huge Faro ore body was discovered in 1965, and mine production commenced in 1970 and continued intermittently until the Faro pit and the smaller Vangorda pit were depleted in 1992.

Source: Yukon Department of Energy, Mines & Resources



Selected results of the CEO survey are as follows:

- 70% are pursuing gold targets at their most advanced Yukon project
- Asset quality and political stability are the dominant reasons for focusing on Yukon
- Power and road infrastructure improvement would significantly increase future investment
- 19% have an advanced stage project with an identified resource
- 13% have completed a feasibility study
- 8 companies anticipate having a newly producing mine by 2015; an additional 4 have planned production no later than 2018
- \$5,242,000,000 in capital expenditures, associated with mine construction, is anticipated by 2018

Source: 2011 Yukon Mining Report - CEO Survey

Yukon has a lot of upside potential left and a relatively good discovery rate ... but Yukon is severely challenged with the lack of infrastructure.

- CEO Survey Respondent (2011)

### Yukon's current mining landscape

Exploration and development companies are increasingly looking to remote regions of the globe for opportunities. Until recently, mining executives seem to have missed the value and opportunity awaiting them on a short flight to Yukon – having access to highly skilled labour, a stable political environment and a year-round deep water port (with capacity to handle mined product). Results from the CEO survey confirm that mining executives are recognizing that value creation can occur in "our own back yard" with limited country risk. Additionally, based on the CEO survey responses, companies operating in Yukon incurred more than \$330M in expenditures for 2010, 57% of which was directly incurred in Yukon with 0.8% being directed to local community initiatives (including schools, community centres, parks, consultations with community stakeholders and other indirect community development projects).









Figure 2 - Yukon project priority vs. other company projects (2011)

Figure 3 - Project advancement in Yukon (2011)





#### Exploration - proving up value

Growing demand for base metals (copper, zinc, lead, etc.) driven by the rapid economic growth of China, India and Brazil, and coupled with a supply-side shortage of these resources, has resulted in mining companies searching for new discoveries in increasingly remote regions that are largely fraught with political country risk.

Additionally, the heightened instability of other economies, government bailouts and financial crises has created a flight to safety in strong currencies and gold. Consequently, the price of gold, (and notably silver, another base currency) has experienced rapid gains, from under US\$800 per ounce in 2008 to over US\$1,800 per ounce in 2011.

Yukon's rampant exploration and development activity has resulted in a notable increase in reserves and resources (see Figures 5-7 and Appendix B). However, with the introduction of reporting guidelines in 2001 under NI 43-101, a large number of historic resource and reserve estimates are no longer valid. Thus, while the listing of Yukon mining project's reserves and resources demonstrate a large amount of identified metals, a significant number of past producing mines and previously explored projects are not quantified using the new standard but are likely to be economically viable. Regardless, the quality of NI 43-101 compliant reserve and resource estimates are not only greatly improved in comparison to some prior methods of estimation, but also serve to provide investor comfort, enabling global players to seek investment in the territory.

Over the past decade, a number of new projects received funding to advance from the exploration to the development stage as a result of favourable conditions for financing mining projects. Advanced stage projects also moved forward – notably Alexco's Bellekeno mine entering production January 2011, and continued production growth of Capstone's Minto Mine through the discovery of new deposits and expansion of throughput. Numerous other projects, meanwhile, have been getting ever closer to achieving commercial operations.



Figure 5 - Gold reserves and resources (2010)



Figure 6 - Silver reserves and resources (2010)



Figure 7 - Copper reserves and resources (2010)



Figure 8 - Gold production



Figure 9 - Silver production



Figure 10 - Copper production

#### **Production – extracting value**

Placer mining has been an ongoing and important part both of Yukon's history and, its current landscape. Predominately small-scale and family-run, there were approximately 140 placer gold mining operations in 2010 producing 51,302 crude ounces (366 crude auoz/ operator), compared with 131 mining operations in 2009 producing 54,478 crude ounces (416 crude auoz/ operator). While placer mining is an important contributor to the economy and rural employment in Yukon, the sector's production statistics are not included in this report, which is focused on hard rock mining (Source: Yukon Placer Mining Overview 2010, Yukon Geological Survey).

In Yukon, the long term trend of metals prices and demand has spawned a number of new producing mines. Figures 8, 9 and 10 summarize the current commercial production in Yukon, based on publicly available data.

In addition, zinc production in Yukon commenced in 2011 as a co-product of Alexco Resource's Bellekeno Mine, and Yukon Zinc's Wolverine Mine. It is estimated that commercial production will begin by the end of 2011.

### Our property is a high quality asset in a prospective area with strong growth potential.

- CEO Survey Respondent (2011)



#### Infrastructure

Yukon is connected with modern communications, roads and energy infrastructure for Yukon residents, including:

- Highways: more than 4,700 km of all-weather roads and a year-round highway system can accommodate loads of up to 77,000 kg. While highway access to mine sites is often an issue in a remote region such as Yukon, the highways that are in place are deemed to have capacity for significant growth. The addition of new secondary or even primary highways will become more pressing for the mining community based on the scale and location of significant new discoveries and development timelines.
- **Airports**: Whitehorse International Airport plus 10 community airports.
- Communications: every community in Yukon has cell phone and high-speed internet connectivity. However, broadband capacity requires further improvement and redundancy (i.e. if the sole fiber-optic cable is damaged, broadband traffic is re-routed through a slower, and older, micro-wave system).
- Electricity: clean, stable energy and a recently expanded electrical grid. Hydro produces more than 80% of capacity, supplemented by diesel plants and renewable power. With large potential for additional hydro and wind development.
- Ports: year-round road access to ice-free ports in the Alaskan communities of Skagway and Haines are available, where Haines can handle inbound freight, and Skagway has the capacity to handle both inbound freight and outbound mined product.

Despite Yukon having a reasonable road network for Yukon residents, the CEO survey responses strongly conclude that while Yukon government is supportive of mining, additional investment into road and power infrastructure to serve the mining sector would have a positive impact on project economics.

The need for further road and port infrastructure investment is compounded by the industry's nearly universal intention to ship mined product via Yukon's road network to the Port of Skagway.





Figure 12 - Government support for infrastructure in Yukon (2011)



Figure 13 - Impact of infrastructure upgrades to projects in Yukon (2011)



Figure 14 - Ranking of infrastructure upgrade significance in Yukon (2011)

#### Ports – key infrastructure development

Based on the overwhelming intention of mining executives to ship mined product through the Port of Skagway, port capacity and near-term expansion should be a primary area of focus for the mining community.

Port of Skagway's ore dock, and other facilities, is the closest port for almost every project currently in development or operation in Yukon. Collaboration with the Yukon government, the federal government, railways, the Alaskan government and operators of the Port of Skagway will be required to implement expansion of export

Figure 11 -Port access



Figure 15 - Shipping method for mined product from mine gate in Yukon (2011)



Figure 16 - Port requirements for mined product from Yukon (2011)

capabilities to meet the near-term supply of material coming from the previously outlined project pipeline. At the centre of the port discussion is ensuring that enough rail bed, with adequate new technology (such as rail car dumpers and mined product storage is in place to meet anticipated infrastructure demand.

In May 2011, the Alaskan government announced its intent to provide funding for expansion to the Port of Skagway. The current plan will have the Alaska Industrial Development and Export Authority undertake a US\$65M bond issuance. Skagway would provide up to US\$5M and the Alaskan state government could potentially allocate an additional US\$10M from the state's port improvement budget for the Port of Skagway improvements, totaling approximately US\$80M. Port improvements would include a new bulkhead dock and general cargo apron, a repositioned ore loader and a floating cruise ship dock that will allow existing docks to be used for industrial purposes.

#### Rail - key infrastructure development

Historically, the Faro Mine shipped mined product by truck to Whitehorse, transloaded to rail, and shipped by rail to Skagway. However, in the final years of mine operation, the Faro Mine trucked directly to the Port of Skagway. Since the Faro Mine's closure, hauling costs have escalated significantly. Re-establishing, and increasing, rail capacity throughout Yukon, terminating at the Port of Skagway, with Whitehorse serving as a hub for the storage and transloading of certain types of mined product is once again an option that should result in reduced hauling costs for mined product. Additionally, longer trains could be achieved through more mine supply and modernized locomotives, and lighter cars could be utilized for higher capacity, providing additional efficiencies (Source: Yukon News (November 2, 2011); Whitepass & Yukon Route Railroad Company).

As a possible alternative to relieve future congestion at the Port of Skagway, Alaska and Yukon have had initial discussions around moving forward with the Alaska Canada Rail Link (ACRL). This would connect Alaska to the Lower 48 United States. This would provide a railbased alternative for inbound supplies to Alaska and an additional outlet for mined product for companies operating in both Alaska and Yukon. While the ACRL Phase 1 Feasibility Study was completed in 2007, with a recommendation to move the project forward, the governments of Alaska and Yukon continue to review the study's findings (Source: Alaska Canada Rail Link, Phase 1 Feasibility Study (2007).



Figure 17 - ACRL rail map





Figure 18 - Power generation intentions in Yukon (2011)





#### Mine site power generation

Further to the need for additional road and port investment, public power infrastructure serving remote communities and the mining sector can be a significant driver for investment in remote regions. This is evidenced by the recent activity in British Columbia with the approval of the Northwest Transmission Line. Along the corridor of Highway 37 in Northern British Columbia, the proposed line – as a partnership between federal, provincial and industry stakeholders – will positively impact the project economics for companies along the corridor, such as: Fortune Minerals Ltd., Imperial Metals Corp., Hard Creek Nickel Corp., and NovaGold Resources Inc.

In Yukon, the availability of access to public power for mining projects is limited. This sentiment is further confirmed by CEO survey responses, such that:

- 35% of companies will use diesel, natural gas, or a private power solution
- More than 60% have yet to identify their power generation intention
- Only 15% have had any negotiations with the Yukon government around accessing the public power grid

However, of those that have had interactions with government officials, 100% identify the Yukon government as either very supportive or somewhat supportive of their needs.



Figure 20 - Yukon mines and power infrastructure



Figure 21 - Yukon employment at a glance (Sept. 2011)



Figure 22 - Unemployment Rate, Provinces and Territories (Sept. 2011)



**Employment** 

Yukon currently has 19,800 people available to work. Of those, 18,700 are currently employed and 800 of them are employed in the natural resources subsector (predominately mining). Also, since 2004, Yukon has registered year over year in migration and an expanding labour force, where the growth is concentrated in the 25–34 year old age group.

However, to meet the near-term needs of mining companies, Yukon will need to attract additional labour from other regions of the country and from around the world. The current global shortage of mining expertise poses a compounding problem for Yukon: attracting top talent to a remote region (posing challenges unto itself); and uncertainty as to the viability of projects due to a lack of infrastructure or perceived government support. Also, with a 5.6% unemployment level, which could be considered nearly a "natural unemployment" level, Yukon simply does not have the labour (skilled or unskilled) to meet the developing needs of the industry for the ongoing operation of abovementioned projects once they commence production.

A further challenge will be the shortage of labour (skilled and unskilled) to undertake the construction of mines, as construction phase resources will compete nationally against other projects, notably the oil sands in Alberta.

The CEO survey highlights that 8 companies anticipate having a newly producing mine by 2015 and an additional 4 have planned production no later than 2018. With Yukon having only 1,100 unemployed residents, the government and mining executives should be exploring additional strategies to attract key resources from across Canada.



Figure 23 - Labour force, unadjusted, by industry (Sept. 2011)

### Yukon is significantly under explored and has a high potential for new discoveries.

- CEO Survey Respondent (2011)

#### **Exploration activity**

There are currently 86 active mining projects in Yukon (source: Metals Economics Group). While the majority of these projects – as evidenced by responses to the CEO survey – are gold, silver, or copper projects, Yukon's diverse metallurgy includes significant development of other base and specialty metals such as tungsten, zinc, molybdenum, platinum, palladium, and others.

Regions of focus are dependent on metal types given the sweeping geological formations of the territory (see Fig. 26).

However, projects in all of these regions face development challenges due to harsh climates, environmental sensitivity, and First Nations considerations. Notable progress has been made, however, through collaboration between mining companies, Yukon and First Nation governments.



Figure 25 - Principal metal resource in Yukon (2011)



Source: Mineral Services Unit of the Yukon Geological Survey (2011)

Figure 26 - Map of Yukon mining projects

The vast number of mining claims, past producing mines and new discoveries in Yukon create a constantly evolving set of new discoveries and projects to be potentially advanced to production. The size and scope of any new discovery changes based on project economics and as knowledge of ore bodies increases through additional drilling and modeling. As a result, tracking the potential

'pipeline' of projects can be a difficult task. However, at the very least, projects with enough drilling to have a completed NI 43-101 compliant resource can be added together to get a simple understanding of overall mining project size in Yukon on a raw tonnage basis (See Table 1).

#### Table 1 - Major Yukon mining projects

Company Name	Market Cap (\$M)	Yukon Projects	Reserve Tonnage	Resource Tonnage	Resource Tonnage (M+I)	Inferred
Capstone Mining Corp. (TSX:CS)	1,150	Minto	12,870,000	52,700,000	44,300,000	8,400,000
ATAC Resources Ltd. (TSXV:ATC)	851	Rau	-	-	-	-
Yukon-Nevada Gold Corp. (TSX:YNG)	440	Ketza River	-	5,157,300	4,081,700	1,075,600
Alexco Resource Corporation (TSX:AXR)	438	Keno Hill District	-	4,042,600	3,545,500	497,100
Western Copper Corp. (TSX:WRN)	268	Casino	1,058,000,000	1,776,000,000	63,000,000	1,713,000,000
Strategic Metals Ltd. (TSXV:SMD)	267	Midas Touch	-	-	-	-
Kaminak Gold Corp. (TSXV:KAM)	259	Coffee	-	-	-	-
Victoria Gold Corp. (TSXV:VIT)	179	Eagle	66,141,000	233,984,000	156,053,000	77,931,000
Prophecy Platinum	189	Wellgreen	-	303,000,000	14,000,000	289,000,000
Ryan Gold Corp (TSXV:RYG)	165	Ida Oro	-	-	-	-
Golden Predator Corp. (TSX:GPD)	136	Brewery Creek	-	-	-	-
Selwyn Resources Ltd	79	Selwyn	-	396,209,000	180,169,000	216,040,000
North American Tungsten	57	Mactung	10,789,842	44,886,000	33,029,000	11,857,000
Silver Range Resources	36	Silver Range	-	-	-	-
Overland Resources Ltd	28	Yukon Base Metal Project	-	8,950,000	6,300,000	2,650,000
Northern Freegold Resources Ltd	25	Freegold Mountain	-	91,388,000	48,499,000	42,889,000

#### Other notable projects held by large caps/international companies

Yukon Zinc (owned by Jinduicheng Molybdenum Group)	8,364	Wolverine	5,208,346	1,690,000	-	1,690,000
HudBay Minerals Inc	2,046	Tom	-	18,530,000	4,980,000	13,550,000
Kinross Gold Corp	18,677	White and Gold Black Fox	-	19,188,000	9,797,000	9,391,000
Total		-	1,153,009,188	2,955,724,900		

Total

Source: Metals Economics Group, Corporate Presentations, Deloitte

#### Project pipeline

Figure 27 reveals first and foremost that a healthy pipeline of near-term producing projects exists. Yukon's three producing mines – Capstone's Minto copper-gold mine, Alexco's Bellekeno silver mine, and Yukon Zinc's Wolverine zinc mine – have a current reserve plus resource tonnage that equates to only 1% of the 'major' projects listed above. Excluding Western Copper's Casino project, this number increases to 6% of total tonnage (other than the fact that the size of Western Copper's project is an outlier, there is no reason this large scale copper project should not be included in the project pipeline).

Even if a fraction of the resources listed above are advanced to a reserves classification and ultimately produced, a large volume of ore will be looking for cost effective ways to find end markets when compared to current production. While the mined product leaving Yukon could be in final product vs. concentrate form, thus drastically altering the range of potential tonnage needed to be shipped, the fact remains that only a small fraction of current resources are moving out of the territory. Also, there are literally hundreds of projects not included in Figure 26. Some of these are past producers or projects with historic resources, while others are greenfield development projects that could, as is evident in any mining jurisdiction, become world-class discoveries. Two historic resources that, if converted to 43-101 compliant reserves and resources, would have a significant impact on Yukon are New Pacific Metals' Tagish Lake Gold Project and Chevron Resources' Crest iron ore deposit.

Survey respondents anticipate that a number of significant projects that advance to production in the near term will inevitably stretch the capacity of infrastructure for outbound mined product and inbound mine equipment.

Additionally, all of these projects will be competing for investor attention on a global scale, as well as competing for people, permits, and infrastructure.

#### Exploration expenditures

In spite of the global financial crisis and economic downturn, the commodity 'super-cycle' continues to drive exploration and development activity for new projects. In 2009, development expenditures more than doubled versus 2007, and exploration was down for the same year over year comparison, partly due to a focus on advancing projects in a race to production.

It is anticipated that 2011 will see a doubling of 2010 expenditures and will thereby set a new record.



Figure 27 - Estimated commercial production date and construction capital cost expenditure estimates in Yukon (2011)

Drilling activity reached record highs in 2010, slightly outpacing 2007 to signal that mining activity has resumed in full force following emergence from the global financial crisis. Drilling activity can be tied to exploration versus development expenditures in Figure 29. The rise in total expenditures seen in 2009 and 2010 versus 2007 is therefore related not only to drilling but also to dollars spent on engineering studies, permit applications and environmental assessments, as well as other development funding.





Figure 28 - Exploration expenditures

Figure 29 - Yukon drilling activity by year

Power and transportation needs a significant upgrade to allow Yukon's mineral potential to be realized.

- CEO Survey Respondent (2011)

#### Advancing projects to production

The majority of companies with activity in Yukon can be considered 'junior' mining companies, with a market capitalization less than \$500M. Typically, companies of this nature have a single flagship asset that is their core area of focus. While a number of other exploration projects may exist within these companies' project portfolio, the expectations of investors and the stock market hinges upon the successful advancement of a single project.

Advancing these projects to production entails an insurmountable hurdle without the financial assistance of a strategic partner, such as the 2010 joint venture partnership between Selwyn Resources Ltd. and China's Yunnan Chihong Zinc & Germanium Co. Ltd. The capital expenditures required to build a mine often exceed the market capitalization of a junior mining company. Raising enough equity in the capital markets is overly dilutive, and raising project finance debt in the current market environment is extremely difficult due to global scarcity of credit. As a result, large capital investment must be sourced from industrial partners such as large-cap mining companies or industrial conglomerates or state-owned entities (SOE) overseas. These types of investors act on a global scale and rank the viability and likelihood of achieving production for a Yukon project against all other global alternatives.

#### Staking

Mining activities in Yukon, including staking and the payment of royalties are governed by two Acts depending of the type of mining taking place. The Placer Mining Act governs Placer Mining activities and the Quartz Mining Act (the Act) governs hard-rock mining activities.

Part One of the Act addresses the management of mineral rights, such as requirements for securing and maintaining mining claims, inspections and enforcement. Part Two of the Act addresses land use and reclamation for mineral exploration activities, outlining specific requirements for different classes of activities in detail.

Not every part of Yukon is available to be staked under the Quartz Mining Act. The act allows staking on "vacant territorial land" and "any lands in respect of which the right to enter, prospect and mine for minerals is under the administration and control of the Commissioner" (Source: Yukon Chamber of Mines – Yukon Mineral Exploration Best Management Practices and Regulatory Guide).

Staking activity for Quartz Claims has experienced significant growth over the past five years, due in part to: the underlying economic need for resources on a global basis; and the discoveries by companies such as Underworld Resources Inc. in the White Gold district (2007), and ATAC Resources Ltd. in the Mayo area (2006 and 2010). Additionally, gold's meteoric rise has resulted in an unprecedented increase in the number of quartz claims staked in 2010.



Figure 30 - Quartz claims staked







Figure 32 - Government support for obtaining permits in Yukon (2011)

Additionally, CEO survey respondents overwhelmingly estimate that increased levels of activity through 2011 and into 2012 are anticipated.

While there are further opportunities for the Yukon government to improve the efficiency of their permitting and approval processes, such as the assessments completed by the Yukon Environmental and Socioeconomic Assessment Board (YESAB), mining executives overwhelmingly view the Yukon government as an enabler of their activities in Yukon, when compared to other jurisdictions in Canada. Yukon is the greatest place on earth ... but not without some challenges ...



Yukon is a great area to work. The market loved Yukon in 2010, but if we don't have additional positive drill results in 2011, the market will drift away to some other "new new" thing.

- CEO Survey Respondent (2011)

### Capital markets and commodity prices

The mining industry is arguably the sector most closely tied to the capital markets. Prices for major metals are traded on exchanges across the globe, and nearly all significant mining development and construction is sourced from publicly raised funds in the debt and equity markets. It is no wonder that the rise and fall of global economies and stability (or lack thereof) of the financial markets can impact the viability of even the highest quality mining projects.

#### **Capital markets**

The mixture of economic growth in some countries, and economic uncertainty in others, has wreaked havoc on global equity markets. In 2010, the TSX and TSXV exchanges raised 60% of all capital related to mining companies globally. 100% of the public companies listed in Table 1 trade on one of these exchanges.

Depending on the size and metal focus of these companies, access to capital to fund future exploration has been notably different. However, all mining companies have experienced volatility surrounding the ability to raise equity capital on a quarter over quarter basis as shown in Figure 33.



Figure 33 - Equity capital raised

#### **Commodity pricing**

Supply and demand fundamentals for commodities in the current market environment is based on the long-term demand growth of developing countries where price curves driven off short-term stockpiles can have drastic effects on commodity prices such as copper and nickel. Vast swings in prices are the norm, but those swings create valuation challenges for early-stage mining projects. For prospective regions such as Yukon, the increased risk of commodity price swings is only exacerbated by infrastructure and environmental uncertainty for project advancement. All of this results in reduced value for early stage projects, which impacts investor interest. Lofty commodity prices for extended periods of time help to mitigate this concern and is evident for most metal prices today.

**Copper concentrate** – analysts forecast that copper prices will drop closer to recessionary levels due to continued weakness in the global economy and a slumping demand in Europe and the western hemisphere. This has cooled off sky rocketing prices for copper, which has more than doubled from lows seen in 2005.

Lead and lead concentrate – prices are typically driven by auto sales. Due to shrinking disposable incomes and lower auto sales, the forecast for lead demand is that it will decrease to its historical average.

**Molybdenum** – demand follows very closely with the demand for steel as more than 73% of production is consumed in the manufacturing of both stainless and other construction-grade steel. Although historical price levels have seen significant variance, analysts forecast molybdenum prices to remain stable in the coming years.

























**Gold** – has experienced a surge in market prices, increasing from an average price of US\$974 per ounce in 2009 to a trading high of above US\$1,900 per ounce during the debt crisis in August 2011. As the global economy stabilizes, analysts predict gold prices to retreat.

**Zinc** – has long been used mainly as a galvanization product for different construction components. Zinc prices have followed the construction industry and its crash in 2008; however, those prices have stabilized in the last 12 months and are forecast to remain that way.

Silver – demand has historically been driven by industrial use, jewellery and photography. However, due to the rise in gold and other precious metals, silver prices have been driven up as investors look to other precious metals as stores of value.



Figure 39 - Silver

#### **Royalties and taxes**

As Yukon continues to emerge as a favourable mining district, key drivers at every stage of development – whether in the pre-feasibility, feasibility, or later stages – are the royalties and taxes owed to the Yukon and the Federal governments. For companies operating in Yukon, the following are key considerations:

#### *Royalties*

Under the Quartz Mining Act, a royalty is a share of profits – not a tax – from a Yukon mine, reserved for the Yukon government as owner of the mineral rights for permitting extraction of mineral resources. It is paid by a mine operator to the Yukon government (under the Umbrella Final Agreement, a portion of the royalty collected by Yukon is shared with Yukon First Nations). Yukon's royalty regime contains a number of eligible deductions on an annual basis including; development allowance, depreciation allowance, community and economic development expense allowance (CEDEA), plus other incentives for mining exploration activity including flow-through equity shares.

Yukon mining royalties are computed pursuant to the Quartz Mining Tax Act. The royalty payable is computed on the "value of the output" in a calendar year at the following graduated royalty rates:

- 0% on the value of output equal to or less than \$10,000
- 3% on the value of output in excess of \$10,000 but not exceeding \$1 million
- 5% on the value of output in excess of \$1 million but not exceeding \$5 million

The royalty rate increases by 1% for each additional \$5 million increment in the value of output and is capped at 12% for the value of output that exceeds \$35 million.

The value of the output from a mine is determined by the regulations in the Yukon Quartz Mining Act. The mine's output value is calculated by subtracting the following from the value of the minerals produced by the mine during the calendar year:

- Operating and maintenance costs for producing and processing minerals from a mining property; exploration and development costs on the mining property; certain insurance premiums; sorting, handling and transportation costs; and reclamation costs.
- 2. Development allowance for the mine as determined under the regulations.
- 3. Depreciation allowance for the mine as determined under the regulations.
- 4. Community and economic development expense allowance for the mine as determined under the regulation.
- 5. The value of the output of the mine, as determined by the regulations, will generally be equal to

the proceeds from the sale of the output to an unrelated party. Related party transactions will be valued at the fair market value of the minerals at the time the minerals are shipped from the mine. Hedging gains, losses and costs are not included in computing the value of the minerals produced by a mine.

#### Taxes

Mining operations in the Yukon Territory are subject to the following taxes:

- Federal and Yukon income taxes
- Federal Goods and Services Taxes
- Yukon Sales Taxes
- Federal and Yukon Fuel Taxes
- Yukon Property Taxes

#### Federal and Yukon income taxes

The federal income tax rate is scheduled to be reduced to 15% effective January 1, 2012. The Yukon income tax rate is 15%. The combined federal and Yukon income tax rate will, therefore, be 30% effective January 1, 2012. The calculation of Yukon taxable income is the same as the federal computation of taxable income.

Although there is a potential 30% tax rate, the federal government provides a 10% investment tax credit to taxable Canadian corporations on pre-production mining expenditures as defined in the Canadian Income Tax Act.

Pre-production mining expenditures related to a mineral deposit where the principal extracted mineral is diamonds, base metals or precious metals qualify for the 10% investment tax credit. The federal investment tax credit may be applied to reduce federal taxes payable.

The federal budget in February 2011 extended the 15% investment tax credit on the flow-through mining expenditures for individuals for flow-through share agreements entered into before April 1, 2012. The 15% flow-through mining expenditure investment tax credit may be used to further reduce the individual's federal tax payable.

#### Federal Goods and Services Tax ("GST")

The acquisition or sale of a right to explore or exploit a mineral property in Canada is not subject to GST. GST will apply on the acquisition of most mining and processing equipment and on the services provided to the mine site. This value-added tax is recoverable in the form of an Input Tax Credit. Generally, GST will apply on the sale of the mineral produced from Yukon mines to a Canadian customer. However, the sale of a precious metal by a refiner (i.e. wafer, bar, ingot, or coin that is composed of gold or platinum with purity levels of 99.5% or silver with purity levels of 99.9%) is zero-rated (i.e. taxable at 0%). Additionally, export sales of all mineral products are zero-rated from GST.

### Yukon sales taxes

Yukon does not have a sales tax.

#### Federal and Yukon fuel taxes

Federal fuel taxes ranging from 4 to 11 cents per litre apply to fuel/gasoline used in a mining operation in Canada. There are some exemptions and/or fuel tax rebates available for certain mining activities.

There is also a fuel tax imposed under the Yukon Fuel Tax Act at a rate of 6.2 cents per litre for gasoline and 7.2 cents per litre for diesel. Similar to the federal tax, there are some exemptions for mining.

#### Insurance premium tax

A 10% federal tax on insurance premiums applies when a Canadian resident enters into an insurance contract with any insurer not incorporated under the laws of Canada (i.e. non-resident). There are exceptions on some classes of insurance where this tax does not apply.

In addition, the Yukon Insurance Premium tax at a rate of 2% applies to a person who purchases insurance outside of the Yukon.

#### Yukon property taxes

Yukon property taxes do not apply to mineral exploration permits and mineral leases on Crown land or land that includes coal, minerals, gravel or other substances occurring naturally in or under the ground. Real property owned by a mining company may be subject to Yukon property taxes if they don't meet the above exemptions.

#### **Environmental assessment**

Yukon is unique in Canada by having a single assessment body, replacing the Canada Environmental Assessment Agency (CEAA) and Provincial assessment processes, conducting assessment of projects located on all Yukon lands, including First Nation's lands.

Most environmental regulations, mining permits and water licenses are covered by Territorial Acts and administered by various Territorial agencies, such as: Energy Mines and Resources, Environment, and Yukon Water Board. Under the Yukon Environmental and Socioeconomic Assessment Act (YESAA) they are identified as Decision Bodies.

The Yukon Environmental and Socio-economic Assessment Board (YESAB) is responsible for conducting the environmental and socio-economic assessment of a project, providing recommendations to the Decision Bodies.

The Decision Bodies can approve, modify or reject YESAB recommendations by issuing a Decision Document. Subsequent to the issuance of a Decision Document, the various agencies proceed with the issuance of Permits and Licenses.

For the 2010/2011 fiscal year, a total of 255 projects were submitted to YESAB. Of these, 92 were mining related, 28 pertained to transportation, and 47 were applicable to land development (which includes residential and commercial). Clearly, mining is at the forefront of well over half of all submissions made to YESAB.



Through our actions and open communication, we have a strong working relationship with the local First Nations' communities.

– CEO Survey Respondent (2011)

### First Nations – potential for true partnership



Yukon has a groundbreaking governance structure and regulatory environment compared to other jurisdictions that can help position the territory as a preferred alternative for mining investment on a global scale.

Regarding certainty, 11 of 14 Yukon First Nations have settled their land claims agreements and have entered into self-government agreements that establish each as a legal entity with powers and responsibilities similar to those of a province or territory – including the right to govern its citizens and its lands.

Three Yukon First Nations are not self-governing and do not have powers authorized by self-government agreements. However, they, too, have rights and authorities within their own traditional territories.

The willingness for mining executives to undertake early and effective engagement with Yukon First Nations and generate significant and long-term community based benefits will build a foundation for successful agreements between industry, the Yukon Government and Yukon First Nations.

#### **Opportunities**

It is imperative that mining companies approach selfgoverning Yukon First Nations as an order of government versus as a stakeholder.

Yukon First Nations' governments have development corporations that are responsible for economic development on behalf of the First Nations and its citizens. While First Nations' governments are responsible for the stewardship of the land with a priority on the long-term sustainability of natural resources, development corporations may place a priority on economic development.

Yukon First Nations' governments and mining projects need a strong reciprocal understanding of each other's values and objectives, which will result in greater project sustainability and success.

Local benefits for First Nations and communities can include training and capacity building, preferential hiring for First Nations' people and companies, joint economic ventures with companies and investment and equity acquisition opportunities.

In the face of a potential second global economic slowdown since 2008, Yukon First Nations have the opportunity to realize significant economic benefits that can support community, social, capacity-building, training and economic development.

#### Potential challenges

Some key challenges facing mining companies include First Nation capacity and/or resource limitations and a 'disconnect' that may exist between the values of First Nations and the perceived values of a mining company.

As First Nations' culture is fundamentally linked to the land and the natural environment, Yukon First Nations can help ensure that the corporate culture and vision of a company is aligned with community and First Nations' values.



### Going forward

In addition to potentially making mining projects more attractive to investors and helping mining companies secure locally based employees and suppliers and streamlining assessment and regulatory processes, early, effective engagement with Yukon First Nations and communities is good business practice that can help increase the likelihood that Yukon First Nations and communities will support the success and sustainability of a mining project.

Representative agreements in Yukon are the:

- Victoria Gold agreement (2011) with the First Nation of Na-Cho Nyak Dun
- Alexco Resource agreement (2008) with the First Nation
  of Na-Cho Nyak Dun
- Yukon Zinc agreement (2005) with the Ross River Dena Council on behalf of the Kaska bands (Liard First Nation, Dease River First Nation, Daylu Dena Council and Kwadacha First Nation)
- Capstone Mining (Sherwood Copper) agreement (1997) with the Selkirk First Nation

Other important agreements elsewhere in Canada are the:

- New Gold agreement (2008) with the Skeetchestn and Stk'emlupsemc First Nations
- Goldcorp agreement (2008) with the Cree Nation of Wemindji (James Bay Cree Nation)
- Vale (Inco Ltd.) agreement (2002) with the Inuu Nation and Nuatsiavut Government

Additionally the various associations across Canada are further attempting to help with information that leads to greater certainty, including the:

- Yukon Chamber of Mines' publication *Quick Reference Guide to Effective and Respectful Engagement Practices with Yukon First Nations and Communities* and their Best Management Practices guide
- Prospectors and Developers Association of Canada's (PDAC) framework *e3 Plus A Framework for Responsible Development*
- BC First Nations and Energy Mining Council's publication *Sharing the Wealth*

#### Certainty

There is greater certainty for mining companies in Yukon than in some other Canadian jurisdictions. Benefits to companies with properties in the territory include:

- The Umbrella Final Agreement (UFA) which was signed by the Government of Canada and Yukon, and the Council of Yukon First Nations in 1993 and provides a framework for the parties to settle land claims in the territory and has legislative chapters outlining land use planning and the development assessment process (among others)
- 11 of 14 Yukon First Nations have settled their land claims (some have over 15 years' experience as selfgoverning First Nations), an incredible strength when Yukon is competing on a global scale for risk capital.
   Also, in contrast to other Canadian jurisdictions, a single environmental and socio-economic assessment process applies in the Yukon to most projects whether they are on federal, territorial or First Nations lands

The Yukon Environmental and Socio-economic Assessment Act (YESAA) is administered by the Yukon Environmental and Socio-economic Assessment Board (YESAB) and incorporates principles that include recognizing and enhancing First Nation traditional knowledge, economies and meaningful participation for all Yukon residents.

With the increased level of exploration activity, the need for both mining companies and First Nations to meaningfully negotiate at an increasingly early stage is becoming more important. As evidenced by responses to this report's CEO survey, almost 30% of companies have yet to commence any discussions with the local First Nations having an agreement in place, or a claim over, the company's staked land. However, it is encouraging to note that 16% have had a very positive experience and a further 38% have had a somewhat positive experience negotiating with First Nations in Yukon.



Figure 40 - Experience negotiating agreements with First Nations in Yukon (2011)

Three key success factors for the mining industry in Yukon are:

- 1. The devolution of land and resource management to the territory by Canada in 2003.
- Comprehensive land and claims agreements have been settled with 11 of the 14 First Nations.
- 3. The establishment of a single assessment authority that conducts assessment on behalf of all responsible authorities (Yukon, Canada and First Nations) has greatly simplified the assessment process and provides for more certainty and transparency in the permitting process.

- Yukon Chamber of Mines (2011)

### Conclusion and outlook

As we head into the second half of what will likely be a "W-shaped" recession/recovery – caused by a realization of unrecoverable losses in the EU, a managed restructuring for several EU member countries, and a softening of demand from China, Japan and South Korea – it would be easy for mining executives, government and First Nations to simply take a wait-and-see approach to the future of mining in Yukon.

We believe this approach would be short-sighted. Yukon is one of the last remaining geographies to be fully discovered – or perhaps, as some would say, rediscovered. The level of exploration activity and the CEO survey sentiments discussed in this report confirm that Yukon's resource is world-class. It is only a matter of time before Yukon will take its place as a world-class mining region.

However, opportunity never comes without challenges. Mining executives should be considering several key risks as they advance their respective projects, including:

- · Access to both skilled and unskilled labour
- A lack of early, and meaningful, consultation with First Nations' governments and communities
- Public power and road infrastructure that can have major impacts to a project's economics
- · Guaranteed access to a port for their mined product

The mining sector cannot overcome its challenges through sheer force of will and determination. Proactive participation from all levels of government, including First Nations will be required. We believe the time has come for the federal, territorial and First Nations governments and the Yukon Chamber of Mines to work together to develop a cohesive and inclusive Yukon mining strategy.



This helmet was worn by Alan Archer at the operations of United Keno Hill Mines Ltd. in the 1960s. It is currently in the possession of his son-in-law, Neil Pogany, a Tax partner in Deloitte's Vancouver mining practice.

## Appendix A – CEO survey

- 1. What is the location of your company's most significant mineral interests? (Please select your choice based on the location of your project with the highest commercial potential.)
- 2 (A). Which of the following would best represent your current stage of development for your company's Yukon mining interests? (Please select your choice based on your most advanced Yukon project.)
- 2 (B). What are the principal metal resource(s) at your most advanced Yukon project?
- 2 (C). What is your estimated commercial production date for your most advanced Yukon mining project? If not applicable, please leave blank.
- 2 (D). What is your estimated cumulative anticipated capital expenditure on the construction phase? If not applicable, please leave blank.
- 2 (E). Currently, what is your plan to generate power at the mine site? (Based on your achievement of commercial production.)
- 2 (F). Does your project anticipate using a green power solution?

If your answer is 'yes' to 2 (F) above, what green power solution do you anticipate using?

- 2 (H). Have you had any negotiations with the Yukon government with respect to working together to obtain access to the public power grid?
- 2 (I). If yes, how would you characterize the Yukon government's ability to work with your company?
- Overall, how would you rate the importance of your company's Yukon assets to your overall exploration portfolio?
- 4. Please rank the following reasons for operating in Yukon from "least significant" (1) to "most significant" (10) ?
- 5 (A). Overall, what impact do you think infrastructure upgrades in Yukon would have on the development of your Yukon assets?
- Please rank the following infrastructure projects in order of impact on your leading Yukon assets from "least significant" (1) to "most significant" (5)?

- 7 (A). What shipping method do you currently use or anticipate using most frequently to ship mined product to market? (Please select all that apply.)
- 7 (B). If applicable, which deep water port do you use, or expect to use, most frequently? (Please specify.)
- 8 (A). Overall, how would you rate the Yukon government with respect to infrastructure support (In comparison to other provinces and/or territories in Canada)?
- 8 (B). Overall, how would you rate the Yukon government with respect to obtaining permits, in comparison to other provinces and/or territories in Canada?
- 9 (A). How would you rate your experience negotiating agreements with Yukon First Nations?
- 11. In 2010, what were your total annual expenditures for the company?
- 12. In 2010, what percentage of your total annual expenditures were spent in Yukon?
- In 2010, what percent of your annual Yukon expenditures did you spend on community development initiatives? (i.e. schools, community centres, parks, consultations with community stakeholders, and other indirect community development projects.)
- 14. In your opinion, please estimate if the amount spent by your company, its subcontractors, and its employees in Yukon communities will increase, decrease, or stay the same for 2011/2012 (e.g. accommodation, food, supplies, etc.)?

Survey questions and responses not included in Appendix A refer to questions that seek comments from the respondent and their responses that will be kept confidential.







2A - Project advancement in Yukon (2011)



2B - Principal metal resource in Yukon (2011)



2C&D - Estimated commercial production date and construction capital cost expenditure estimates in Yukon (2011)



2E - Power generation intentions in Yukon (2011)



2H - Power generation - Seeking government support in Yukon (2011)



3 - Yukon project priority vs. other company projects (2011)



Question 4 - Rationale for operating in Yukon (2011)

### Source: 2011 Yukon Mining





5A - Impact of infrastructure upgrades to projects in Yukon (2011)





6 - Ranking of infrastructure upgrade significance in Yukon (2011)







7B - Port requirements for mined product from Yukon (2011)

8B - Government support for obtaining permits in Yukon (2011)



9A - Experience negotiating agreements with First Nations in Yukon (2011)



14 - Expenditure growth expectations for 2011 and 2012 in Yukon (2011)

### Appendix B – Reserves and resources



Figure 41 - Nickel reserves and resources (2010)



Figure 42 - Lead reserves and resources

3

2

2











Figure 43 - Yttrium reserves and resources (2010)

Figure 46 - Molybdenum reserves and resources (2010)





Figure 47 - Palladium reserves and resources (2010)



Figure 48 - Cobalt reserves and resources (2010)



Figure 49 - Zinc reserves and resources (2010)

10 9 8 Thousands mt 7 6 5 4 3 2 1 Total Total Total Resources Resources Reserves Containing Inferred Source: Metals Economics Group, Deloitte Research

Figure 50 - Niobium reserves and resources (2010)



Figure 51 - Platinium reserves and resources (2010)



Figure 52 - Iron reserves and resources (2010)

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