

**ORE**

# **GOLD:**

## **The Never-Ending Quest**

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**GOLD FEVER IN SASKATCHEWAN**

**MARS**  
**VIRTUAL CLAIM-STAKING**

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**COVER PHOTO**

**ALL THAT GLITTERS**

The 2014 Sochi Olympics have given us gold fever, and we're passing it on to you. In this issue of ORE Magazine, we're featuring everything you need to know about the mineral, from its properties and history to the present day mining industry in our province. It's all here... even a special story about the making of Olympic medals. Read on to find out more about Saskatchewan's golden touch.

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## MINING: GREAT FOR SASKATCHEWAN BUSINESSES!

### A MESSAGE FROM SMA EXECUTIVE DIRECTOR – PAM SCHWANN

If you've been fortunate enough to see visible gold, ("VG") in situ, or have tried your hand at panning for a few flecks of gold, you know that the sight of the precious yellow metal can do strange things to a person. As evidenced by many a "gold rush," native gold can turn anyone into a prospector wannabe. Gold has had this effect on civilization for centuries - it is recognized as a stable global currency, is a sign of prestige and wealth, but is also functional as a component in many of today's high tech applications. Gold is in the spotlight in the 7th edition of *ORE*.

Most of the more than 250 gold occurrences in Saskatchewan are scattered throughout northern Saskatchewan's Precambrian Shield. The province has a long history of primary gold production, initially offering a glitter of promise along the northwest shore of Amisk Lake in 1915 to the more recent gold deposits of the La Ronge Gold Belt and Claude Resources', Seabee Mine. The allure and colourful history of the La Ronge Gold Belt is presented in our cover story while the challenges and opportunities of operating Saskatchewan's

most prolific primary gold producer, the Seabee Mine, is also featured. Explore how gold deposits are found and where they are located in the Ore Deposits section.

While the mining sector is a global industry, the importance of being a good neighbour to local communities remains paramount. The article on the Eastern Athabasca Regional Monitoring Program describes how this program addresses the concern of whether country foods continue to be a safe part of a community's diet when mines are developed in the region. As we "Tag Along" with Cameco Corporation's Darrel Burnouf, Manager Business Development

and Northern Affairs, you'll also see this good neighbour principal in action as he travels the north supporting northern business development.

Investors and companies all over the world have an interest in supplying, exploring and developing Saskatchewan's mineral deposits. Learn how local Saskatchewan supplier PapaBravo has innovated a new man-carrier for Saskatchewan and is now supplying this product to international markets. The technology article on MARS demonstrates the difference accessibility is making in attracting investment to the province. The economic commentary revisits the

international work underway to provide greater revenue transparency amongst the mining sector, governments and communities. While mining operates in an international arena, the Olympics represent the pinnacle of international sports competition. The *eARTh* article examines what it takes to make an Olympic medal.

Our *Beyond the Bio* features Ross McElroy, President and Chief Operating Officer, Fission Uranium Corp., whose exciting new uranium discovery on the southwest rim of the Athabasca Basin has opened up an exciting new chapter of intrigue. Please read on, but keep your gold fever in check.



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# GOLD

Provided by Sask Geological Survey, Ministry of the Economy

### Characteristics of Gold

Gold is a naturally occurring element that is highly valued due to its unique physical and chemical properties and its scarcity in the Earth's crust. It is considered a "precious metal" because of its economic value and a "noble metal" due to its resistance to oxidation and corrosion. Gold is highly malleable, has a desirable colour and lustre, and is a good electrical conductor. It is most commonly present in native form in nature but can also occur as alloys with other elements (e.g.

silver) or as more complex chemical compounds.

### Uses of Gold

Gold has been one of the most treasured natural substances in human history. For thousands of years people have used gold as currency, for creation of ornamental objects, and in jewelry. Its value persists today, as gold is held as a form of monetary reserve in many central banks and, whether recycled or newly mined, is most widely used for jewelry. Other modern uses of gold include



electronic components (e.g. smartphones and tablets), medical and dental applications, and photographic processes.

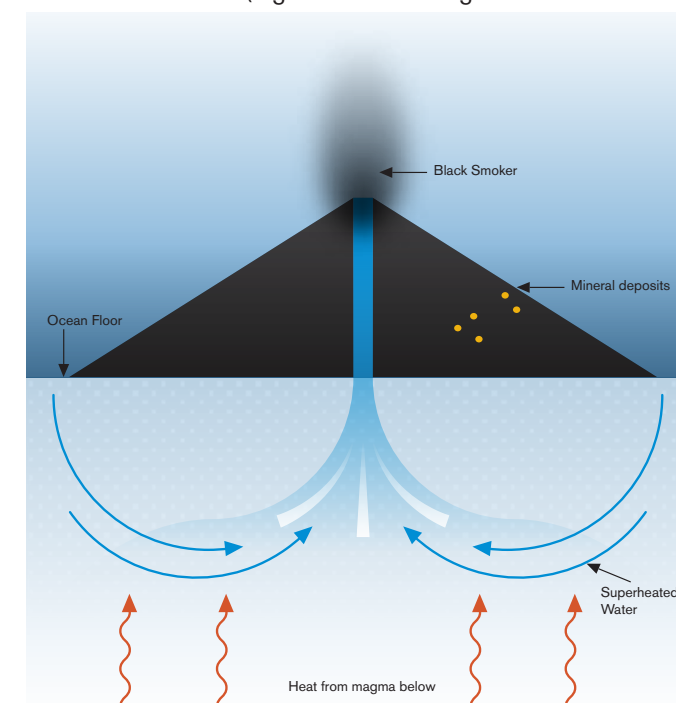
are also present in southern Saskatchewan, where erosion of older gold-bearing rocks has resulted in localized concentration of "placer" gold.

### Formation of Gold Deposits

There are many types of gold deposits in the Earth's crust; most are formed by hot aqueous fluids related to magmatism or metamorphic processes, or due to subsequent erosion and redeposition of pre-existing mineralization. In Saskatchewan, most known gold deposits are present in rocks of the northern Precambrian Shield. The majority of this gold was deposited between 1.9 to 1.8 billion years ago, either (i) by seafloor black smoker vents caused by submarine volcanism (i.e. volcanogenic massive sulphide deposits), or (ii) in quartz veins emplaced in fault zones (i.e. 'orogenic' or 'mesothermal' gold). A few small deposits

### Gold in Saskatchewan

Some significant gold discoveries have been made in northern Saskatchewan over the past century. Over 3 million ounces (oz) of by-product gold was mined from the Flin Flon Cu-Zn deposit between 1930 and 1992. The Seabee mine, 125 km northeast of La Ronge, is the largest ever gold-only mine in the province, having produced over 1 million oz since 1991. A number of small mines straddling Highway 102 between La Ronge and Reindeer Lake have cumulatively produced over 600,000 oz of gold over the past 30 years. On the north shore of Lake Athabasca, the Box and nearby Athona deposits together contain an estimated 1 million oz of gold.





# GOING FOR GOLD

## What does it take to make a wedding ring?

Using the output at Claude Resources as an example, it takes more than a tonne of ore to make a typical gold wedding ring. That means you could produce about 500 wedding rings a day from Claude's current output. According to the website of eHealth Saskatchewan, the province averages 6,000 marriages per year. If that resulted in 12,000 wedding rings, Claude would have to spend almost three weeks mining more than 15,000 tonnes of ore to fill the order. *(Note: The numbers are based on broad assumptions, and should not be used to accurately calculate the output or grade quality at Claude Resources.)*

Seabee Gold Mine Head Frame.

## GOLD IS UNIQUE. SO ARE THE CHALLENGES OF MINING IT.

For a Saskatchewan potash mine, the grade per tonne (i.e. the amount of potassium you expect from a tonne of ore) is roughly 25 per cent. Cameco Corporation's uranium mines average grades of approximately 18 per cent. At Claude Resources Inc., owners of the only currently operating gold mine in the province, the average grade is 0.0006 per cent (i.e. 6 parts per million). That's just one of many stark differences between mining gold and other minerals.

Claude, a Saskatchewan-based company, operates the Seabee Gold Operation about 125 km northeast of La Ronge. The operation consists of two mines – Seabee and Santoy 8 – employing roughly 300

workers year-round. The property was first staked by Cominco in the 1940s. Some 50 years later, Seabee Mine became an operating gold mine, pouring approximately 45,000 ounces of gold each year. In August 2012, it poured its one millionth ounce of gold. The company continues to expand its operations and produce gold, despite the difficult market conditions of the past year.

Gold spot prices plummeted 25 per cent in 2013, causing hardships for gold mining companies everywhere. Claude and other junior gold mining and exploration companies are significantly undervalued at present, and are trading well below historic norms. Spot prices on the market, which can

be volatile, are especially meaningful for companies like Claude and other junior mining and exploration companies, because that is how they usually prefer to trade. In contrast, potash and uranium are most often sold through long-term contracts that hedge against market volatility.

Nowhere were the effects of the gold downturn more evident than at Saskatchewan's only other operating gold mine, owned and operated by Golden Band Resources. The Jolu mine, located in the La Ronge Gold Belt, began commercial production in April 2011. In December 2013, the company announced it was suspending operations,







Seabee Gold Operation.



A gold brick.

citing the low price of gold and lower than anticipated ore grades. However, the company still owns 13 valuable deposits – notably Golden Heart, Komis and Bingo – within a land package of 870 km<sup>2</sup>.

Claude Resources has been able to weather the storm, as it has done consistently in the past. “We are one

of the few Canadian gold miners producing less than 100,000 ounces of gold a year that has stayed in business the last 20 years,” says Brian Skanderbeg, senior vice-president and COO. “Our employees have done a tremendous job of being efficient, and our owners and financial partners have supported us along the way.” This has

allowed Claude Resources to manage their gold business through the lows of the cycle while not sacrificing the long term strategy of growing production and improving margins. “Gold is different from many other commodities on the market,” adds Skanderbeg. “The market value of gold depends a lot on the strength of the US dollar; if the dollar is strong, gold values will generally go down. That’s why higher gold prices often occur during global economic downturns.

To generate more capital to concentrate on increased production in Saskatchewan, Claude sold most of its interest in the Madsen Gold Project in Ontario, while retaining approximately a 10 per cent interest in the company that purchased the asset. This new capital

will add to the \$80 million that Claude has already expended on extending the Seabee shaft in early 2013 to 1000m depth, upgrading its Saskatchewan camp facilities, its mining and hauling fleets, water treatment facilities as well as investing in exploration which has had a significant payback with the discovery of new deposits, such as the L62 and the Santoy Gap. These investments have allowed Claude Resources to lower its mining costs, access new ore bodies and significantly grow their reserve and resource base to outline a viable and growing production profile going forward.

Claude’s future resiliency has been strengthened further with the addition of the Santoy Gap deposit, which will increase production and

margins while decreasing the risk of mining from only two ore bodies. “With three new ore bodies going into production in the past three years,” notes Skanderbeg, “we now have roughly 1.25 million ounces of gold in resources, the largest resource in our company’s history. Our current life-of-mine plans take us into 2023.”

Still, there’s the problem of getting to it – and gold, it seems, never likes to make things easy. For most of the year, the Seabee operations are accessible only by air, with nothing but lakes, thick bush and swamp in between. The window of transportation opportunity comes when the formidable terrain sufficiently freezes over – January, February and March – so that you can build a temporary road to the mine site. In just those three months, Claude brings in its camp supplies for the entire year, between

300 and 400 semi-loads. Paying for it all is always the challenge, and being able to do so mainly comes down to ore grade, even a grade of just 0.0006 per cent. Just like the early prospectors (see story, p. 11), the operators of

today’s gold mines need to be determined and strong-willed. And just as a good prospector would make very wise use of his precious supplies, gold mining operations have to use the resources at their disposal very carefully. “That’s why

we have to concentrate so intensely on efficiencies, and make cost-saving moves wherever we can, throughout the operation,” says Skanderbeg. “Those can be tough decisions.”



Gold being poured.

## The Ice Road to Seabee

It’s a major lifeline to the Claude Resources’ Seabee gold mine – a 70 km lifeline made of ice that begins 170 km north of La Ronge, off Highway 102, adjacent to Brabant Lake. At that point, there’s a landing area where double-trailer (“super B”) trucks are typically split into single-trailer loads that comply with the 80,000 lb load limit, including the truck, trailer and payload. Usually only one truck at a time is on the ice, or else the vehicles are a minimum of one kilometre apart. Overseeing the trip is an NRT road marshal in a half-ton truck, whose job is to constantly monitor ice conditions and other safety factors.

The first leg of the trek is the 26km across Brabant Lake,

followed by a series of portages and smaller lakes to the Seabee mine site. With a maximum speed limit of just 25 km/hr, the trip takes roughly three hours. Drivers have to go very slow when driving onto the ice – for the first kilometre – and for the last kilometre of ice before reaching land; this is to prevent compromising the ice conditions through “compression waves” of water under the ice caused by the truck’s weight.

Usually, the road opens in mid-January, once the ice has reached a minimum thickness of 30 inches of clear blue ice, as regulated by Saskatchewan Highways. Claude

Resources builds and maintains the road, using skidoos to initially mark the route. They make the road approximately 100 feet wide, to help ensure that exposure to the elements keeps the ice solid. (Snow acts as an insulator which slows down the freezing process; that’s why this year, despite the cold weather, the road didn’t open until February.) NRT Limited Partnership, the trucking company, is responsible for controlling traffic, monitoring speed limits, recommending maintenance, and determining when it is safe to use the road. To monitor the ice thickness, NRT takes measurements every 250m, in the middle and either side, using a chain

saw with a four-foot measuring blade. Even if ice conditions are still good, the road closes at midnight on March 31 as per SGI regulations, with possible one-week extensions granted through special application to SGI.

By the way, you won’t see any hint of the outrageous antics on the television show, Ice Road Truckers. “We would never hire drivers like those guys,” laughs Dave McIlmoyl, President of NRT. “Safety is our number one concern, always.”





# THE LURE OF THE LA RONGE GOLD BELT

*“There are strange things done in the midnight sun  
By the men who toil for gold;”*

*The Cremation of Sam McGee*  
Robert W. Service

Even though Service (who died in 1958) never visited La Ronge, we can be certain it would have appealed to him, as did much of Western Canada and the Yukon. The determined, rugged individuals he would have met in northern Saskatchewan, in the 1930s and later, would have fit the romantic characters of his narratives who “moiled” (i.e. worked hard) for gold.

For any prospector, no other metal has the lure of gold. It is the winning lottery ticket, the “impossible dream” that has caused many individuals to have “gold fever.” It is also much more elusive than most people realize. There are signs you look for to increase your chances, but even then,

you could spend a lifetime searching for it – and be only a few hundred feet away from ever discovering it. Nuggets of gold, which have inspired the historic gold rushes in California and the Yukon, are located in “placer” deposits, such as river beds where flecks of gold can be seen. While Saskatchewan has seen minor gold recovered from placer deposits along the North Saskatchewan River, most gold production from Saskatchewan has been found in underground seams in the Precambrian Shield of northern Saskatchewan, where just the right conditions over millions of years have generated the necessary environment to concentrate the precious metal.

The La Ronge Gold Belt, a package of rocks stretching from La Ronge to Southend, has arguably generated the most interest in gold exploration from an historical perspective. While prospective geology has been a major factor in the location of gold deposits along this belt, another key factor is the proximity of Highway 102 that runs alongside much of the belt, increasing accessibility and lowering exploration and production costs.

Unanimous credit for the identification of gold deposits in the area goes to J.P. Mawdsley and his colleagues at the University of Saskatchewan, and members of the Geological Survey

of Canada. Mawdsley reported favorable rocks in the Sulphide Lakes area north of La Ronge during his reconnaissance in 1931. The next year Adolf Studer was one of the very first prospectors in the Gold Belt, inspiring many others (including, eventually, his children and grandchildren) to follow suit.

Adolf Studer brought his family into the La Ronge area in 1936. His son, Vern, was 11 years old. From then until he was 23, Vern and the family never left the homestead and saw very few other people other than the odd passerby. “We trapped and did what we could to keep going during the winter, and come the



Journey of Prospector Discoveries to Gold Mines; La Ronge Gold Belt

Showing/Mine	Prospector/ Company	Discovery	Production Years	Grade (oz/ton)	Gold Recovered (troy oz)
Decade (Mallard)	J.B. Coffyne and L. Gaski	1944	1973-1975	0.300	425
Star Lake (21 and Rush Zones)	Eugene and Mary Hird, (Rush and Pie Zones)	1961	1986-1989	0.387	76,900
	Eric Partridge (KAHN Zone)	1961			
	Starrex/SMDC	1983			
Jolu Mine (Rod & Mallard Zones)	Mahogany Mineral Resources	1984	1988-1991	0.401	203,301
Jasper	SMDC	1987	1990-1991	0.553	82,697
Komis	Eric Partridge	1958	1996-1997	0.201	26,859
Contact Lake	SMDC	1987	1995-1998	0.2	189,920



Thank you to the Saskatchewan Geological Survey, Ministry of the Economy, for their assistance.

spring we went prospecting,” Vern remembers. He has been a prospector all his life, as well as flying planes for mining companies for more than 50 years and building the family’s mining business. “Prospecting is something that’s in your blood,” he declares. “You first look for the right rock formations, then the right mineralization, then the shear zones. Sometimes if you get lucky, you actually get

a showing. But every day, you feel you’re just getting closer and closer. You just can’t quit. That’s just the way it is.” Although Adolf Studer found several high-grade showings over the next five years, there was no bonanza. In the 1940s, companies such as Cominco staked some claims, but there never was a “gold rush.”

The same was true in the 1950s, but the stories began to become more interesting as more and more prospectors came to the Belt. Their tales were collected by Beresford (“Berry”) Richards in the book *Gold and Other Stories*. As the book recounts, they were encouraged in part by the Government of Saskatchewan’s introduction of the Prospectors’ Assistance Plan, as well as its “Prospector Schools,” which introduced the uninitiated into the realities of “moiling for gold.” The school, which was originally instructed by government geologist Malcolm Norris and Mining Recorder Don Sheridan, ran from 1948-1953 with various permutations of the school being resurrected until the 1990s. Eric Partridge, a prolific prospector in the area, was, as noted in Richards’ book, one of the major employers of aboriginal prospectors, such as Mclvor Eninew and Andy Flatland, who “once trained in what to look for, had a natural instinct to hunt for mineralization.” Much like the Studer and Partridge families, the Eninew and Flatland families had an affinity for the prospecting life.

Geoscience and technology were foundational to attracting interest and focusing prospecting efforts in the La Ronge Gold Belt. Dr. A. R. Byers, with the Saskatchewan Geological Survey, mapped the major rock types and structures in the Waddy Lakes area in 1948, and the federal government issued electromagnetic maps in 1953 and 1957 which spurred interest. Still, no gold rush, and for decades gold was far from the forefront of mineral discovery in La Ronge or anywhere else in Saskatchewan.

It was the mood of investors, driven by the dramatic

increase in the value of gold, that brightened the promise of the La Ronge Gold Belt considerably in the 1980s. Drawn to the area by the initial discoveries made by prospectors such as Eric Partridge in the 1950s and 1960s, companies focused their exploration efforts on a corridor bounding highway 102, between La Ronge and Brabant. Within a short period, dozens of mining ventures were in the La Ronge Gold Belt and the area was once again a hive of exploration activity, drawing in over \$100 million in exploration investment between 1986 and 1996.

One of the leaders of this gold rush era was Ron Netolitzky with Golden Rule Resources, who ended up with an extensive land portfolio that covered a number of the gold properties in the La Ronge Gold Belt. When the (gold) dust settled, the La Ronge Gold Belt was host to a number of relatively high grade, low tonnage operations that cumulatively produced approximately half a million ounces of gold between 1985 and 1998. While the La Ronge Gold Belt has yet to produce a million ounce mine, like the Seabee Mine further to the east, the La Ronge Gold Belt continues to draw interest today, with more recent production from Golden Band Resources’ Roy Lloyd Mine and additional efforts at the enigmatic Komis deposit. (see Golden Band article in ORE Fall 2011/ Winter 2012). With the concentration of showings and deposits in the area, the lure of gold in the La Ronge Belt is sure to continue to attract gold fever for many more generations.

Prospector Claims to Fame

Eric Partridge – Born in Carnduff SK in 1915, Eric Partridge studied engineering and business in Toronto before returning to SK in the mid 1940s. Forming his own company, E.F. Partridge & Associates, Partridge focused his considerable prospecting efforts in northern Saskatchewan. Among many discoveries, in 1949 Partridge discovered uranium at Charlebois Lake near Lake Athabasca, zinc in the rocks of the Wollaston Domain and in 1958, found the Komis gold deposit near Waddy Lake in what is now referred to as the La Ronge Gold Belt. Eric’s son David was also a successful prospector, finding base metal deposits at Gow Lake, and numerous other showings.

Mclvor Eninew and his son Simon were successful prospectors who often worked independently and for E.F. Partridge and Associates. Prospects Simon discovered included a copper-bearing boulder that resulted in extensive exploration of the Janice Lake area by many companies. Gow Lake, where the Eninews’ trapped, is recognized as one of Saskatchewan’s meteorite impact structures.

Andy Flatland and his sons Samuel and George were from Sucker River north of La Ronge. They provided solid prospecting and mineral exploration support to outfits like E.F. Partridge & Associates and the Don Fisher Syndicate. George Flatland, who started prospecting as a teenager, discovered a rich zinc-lead showing , called “George Lake showing” while prospecting for Partridge. He went on to own his own exploration business, becoming a bush pilot and providing geophysical, line cutting and claim staking services to exploration companies in northern Canada until the mid 1990s.

Art Sjolander – While en route to prospect in British Columbia, Art stopped in La Ronge in 1959 to take the Prospectors School, liked what he saw in the rocks, and never left. In 1966, Art was involved in the discovery of the uranium-bearing boulder field in that led to the discovery of the Rabbit Lake uranium deposit.





# MONITORING THE EASTERN ATHABASCA

## A COLLABORATIVE STRATEGY KEEPS CLOSE WATCH ON THE REGION'S ENVIRONMENT AND TRADITIONAL FOODS.

Saskatchewan's north is pristine, valued for its beauty, wildlife, recreational opportunities and natural resources. The quality of the plants and animals harvested by local residents have long contributed to a healthy and affordable diet. When a mine is developed a concern of local communities is that the "country foods" may be contaminated and no longer safe to eat.

To ensure that mining is done in an environmentally and socially responsible manner, there are many federal and provincial regulations that mining companies must follow, including extensive amounts of environmental monitoring near each uranium mining and milling site. The Athabasca Working Group (AWG)

Environmental Monitoring Program, which started in 2000, provides additional regional sampling. Initiated in 2011, the Eastern Athabasca Regional Monitoring Program (EARMP) was designed by the provincial government, communities and the mining companies to complement the existing monitoring programs and provide long-term environmental information and monitor for potential cumulative effects downstream of uranium mining and milling operations. The EARMP is an environmental monitoring program in northern Saskatchewan consisting of both a community and technical program.

The Technical Program involves analysis of both the physical and biological components of water bodies located downstream of

converging watersheds that are exposed to mining and milling operations in the Athabasca region. Water, sediment, fish, and benthic invertebrate community (bug) samples are collected from waterbodies located far downstream of uranium operations in the region as well as from water bodies not affected by mining activity, to serve as comparative references. Samples are sent to Canada North Environmental Services (CanNorth) and the Saskatchewan Research Council (SRC) for analysis.

The Community Program was established to answer the question of whether country foods near the communities are safe to eat. Water, fish, berries, moose, and barren-ground caribou are collected by local community members as part of the community

sampling program. Seven communities participate in the community sampling program including Black Lake, Fond du Lac, and Hatchet Lake Denesuline First Nations, Wollaston Lake, Uranium City, Camsell Portage, and Stony Rapids. These communities determined what samples should be taken and from where. The Ministry conducted training and information sessions showing how to properly take samples from local foods and submit them for laboratory analysis to CanNorth and SRC.

The EARMP is administered by the Ministry of Environment, under the direction of Dr. Kevin McCullum, Chief Engineer. He is quick to share credit for the origination of the program with AREVA Resources Canada, Cameco Corporation, the medical

community and local leaders. "Everyone felt that the EARMP was a necessity," says McCullum. "It was helpful that we had already established very positive relationships through previous initiatives such as the Athabasca Working Group."

According to McCullum, the EARMP's two major benefits are, "the confidence that the involvement of the community with the other partners has brought about in the safety of the water and country food they eat; and the sharing of information that now takes place among the various interest groups. It's fostering a lot of feedback."

One of the professionals involved in the development of the EARMP and interpretations of data is Dr. James Irvine, Medical Health Officer, Population Health Unit, for the Mamawetan Churchill River, Keewatin Yatthe Health Regions & Athabasca Health Authority. Dr. Irvine has been practicing as a public health doctor in the north for more than 30 years. "I am one of many who review the report drafts," says Dr. Irvine, pointing out that the EARMP involves a wide range of specialists such

as toxicologists, chemists, biologists, as well as those who know and largely practice the traditional Métis and First Nations ways of life. "I am encouraged by the transparency and the collaboration," he says. "Monitoring is a purposeful activity. It not only assesses if any impacts have taken place and the effects of programs and policies, but also points to what needs to be done. The engagement of local people is really valuable and important."

Since the community sampling program began in 2011, 12 water, over 120 fish, 60 berry, 11 moose, and 38 barren-ground caribou samples have been tested for the program. Results to date have concluded that the country foods assessed in the Eastern Athabasca region are safe to eat and can be consumed with the same, and perhaps greater assurance, as a southerner shopping at their local grocery store. McCullum says the Ministry and its partners are pleased with the EARMP. "It has been very successful and well-received by the community, with good feedback, good participation."



The community program samples water at each community as well as berries, fish, moose, and barren-ground caribou that community members collect.







# COUNTRIES, COMPANIES AND CITIZENS BENEFIT FROM GREATER REVENUE TRANSPARENCY

Brendan Marshall

Director, Economic Affairs, Mining Association of Canada

Resource extraction is a powerful ally of international development if done responsibly. Tremendous potential exists for the sector to assist many of the world's resource-rich but poor countries in elevating their living standards. For this to occur, however, a number of conditions need to be met.

Transparency through financial disclosure enhances responsible resource development and helps address a key challenge impacting the broad social acceptance that underpins many companies' privilege to operate. But this privilege can be compromised when the consequences of mismanaged resource revenues create an atmosphere of distrust among project stakeholders and, in some instances, escalate into events that disrupt operations or delay project development.

Part of the privilege to operate lies in the project-generated benefits the host communities receive by virtue of development and continued operation. By creating jobs and business opportunities, developing infrastructure, providing skills training and building capacity, resource development can meaningfully reduce poverty through direct and indirect social and economic impacts.

In addition to the economic engine provided by employment and local procurement, governments accrue significant benefits through the collection of mining taxes and royalties. These revenues have the potential to be transformed into valuable public investments such as health and education services and infrastructure. Such investments would reinforce a company's privilege to operate while also addressing local challenges

through investment. However, in developing countries, barriers remain that at times prevent the potential benefit from such investments in the public interest from being realized.

Poor governance and mismanagement have, at times, meant that the expenditure of extractive sector revenues collected by public officials have not made their way into government coffers. Secrecy around flows of funds from the extractive sector has also contributed to mistrust between local citizens, communities, their governments and companies, at times leading to outright conflict.

These challenges are systemic and, as

they lie within the host country's jurisdiction, have historically been beyond the purview of any single company to address independently. Acknowledging this, organizations such as the Extractive Industries Transparency Initiative, Publish What You Pay (PWYP) and the Revenue Watch Institute (RWI) have promoted their vision for the transparent and accountable management of natural resources and the revenues generated there from.



Efforts have sought to equip communities with the information necessary to hold governments accountable for the expenditure of extractive sector revenues. By developing an accountability framework, the theory holds that resource revenues will be more likely to benefit the citizens and rightful proprietors of the resources.

Many countries and companies are now participating in these frameworks. Canada has announced its intention to implement a transparency framework for the mandatory disclosure of company payments to foreign governments derived from extractive activities.

Given that approximately 60 per cent of the world's mining companies are registered in Canada, and more than 800 Canadian exploration companies are active in 100 countries, Canada's

commitment to this initiative is significant. Canadian stock exchanges, the Toronto Stock Exchange and TSX Venture in particular, host the lion's share of the total global value of mining sector market capitalization, and mining equity capital raised.

In January 2014, the Mining Association of Canada, the Prospectors and Developers Association of Canada, PWYP and the RWI announced the completion of a Canadian framework for mining companies to disclose payments made to governments. The aim is to make informed policy recommendations to provincial security regulators and/or federal government policymakers for the Canadian adoption of mandatory disclosure requirements.

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# NEW ONLINE SYSTEM REPLACES A CENTURIES-OLD PROCESS

The first year of operation went well but there will still be modifications made to the system to improve its operation. According to Detharet, many of the “start-up” issues were addressed in 2013, but it probably won’t be until the end of 2014 when all the necessary adjustments will be completed. MARS is here for the long term. The system will continue to be updated and improved to meet the needs of Saskatchewan’s growing mining sector.

Another key partner was industry – members of the Saskatchewan Mining Association (SMA) – who assisted with developing and testing the program. “We have a close, long-standing relationship with industry,

“To the client, it looks like a very simple operation,





2014 Sochi Medal Count

	Country	Gold	Silver	Bronze	Total
	Russian Fed.	13	11	9	33
	Norway	11	5	10	26
	Canada	10	10	5	25
	United States	9	7	12	28
	Netherlands	8	7	9	24
	Germany	8	6	5	19
	Switzerland	6	3	2	11
	Belarus	5	0	1	6
	Austria	4	8	5	17
	France	4	4	7	15

medal – one that contains material from the meteorite that exploded over the Russian city of Chelyabinsk on February 15, 2013. (An additional 40 commemorative “Chelyabinsk medals” were distributed to various organizations.)

For those who might be wondering, gold medals haven’t been made out of gold since 1912. Gold medals are made of silver and then gold-plated with 6 grams of gold. Olympic winners are often surprised at the weight of their medals. Each gold medal weighs 460 grams – roughly one pound. From a purely metal perspective, a gold medal might be worth approximately \$600-\$700 including the value of its silver. But who in their right mind would ever melt one down?

eARTh

OLYMPIC METALS

There’s a lot that goes into winning an Olympic or a Paralympic medal. But what goes into making one?

There’s a unique story behind every Olympic and Paralympic athlete. So, too, is the story behind the medals they take home. The medals for the 2014 Winter Olympics and Paralympics in Sochi are a perfect example.

Engineers, engravers, die technicians, machinists and production experts were involved in the 25 steps to make the medals. Each medal took approximately

18 hours to manufacture, except for the Paralympic medals, which took 20 hours. Paralympic medals, following a modern tradition, have an additional Braille inscription, and are slightly heavier than the Olympic medals.

A record total of 1300 medals were produced in Russia, using three kilograms of pure gold, two tons of silver and 700 kilograms of bronze from Russian mines. The

medals are 10 millimetres thick and 100 millimetres in diameter. Each medal has a polycarbonate insert which mimics a patchwork quilt with designs that pay homage to the various regions in Russia. The overall design is intended to depict “the sun’s rays reflecting through a prism of snowy mountains and sandy beaches.” The winning design was selected from eleven entries, and had to be approved by the International

Olympic Committee (IOC). Each medal has the official name of the Games in Russian, English and French. In addition to there being more medals produced than ever before, they will also be more diverse, with additional designs to include the twelve new Olympic categories such as “ski half-pipe.”

The athletes who won gold medals on February 15 will have an even more special







# FORGING LINKS IN THE SUPPLY CHAIN

FOR PAPABRAVO, GETTING THE CALL WAS JUST THE BEGINNING.

For several years, Patric Byrns had been working on a practical, durable electric vehicle. His prototypes began to attract interest, including that of at least one Saskatchewan potash mining company. "They called me because they could see the potential," recalls Byrns. "Ventilation in underground mines is obviously a big determinant of what you can and cannot do. Our technology

allows more vehicles underground, moving more people. That results in more profits for the mine."

An expression of interest is far from a purchase order, and Byrns knew it. He immediately concentrated on creating a collaborative relationship, and the mining officials responded. "In the beginning, we asked a lot of questions, and listened carefully to the answers.

They gave us access to key people – the people who would be most directly involved with our vehicles. I'd say we spent at least three of the first six months of our discussions underground."

Byrns and his team focused on what he calls "the real world problems" of a mining operation. "We also pointed out solutions to problems that maybe they hadn't even identified. We concluded

we had to make the vehicles simple to operate and maintain, which led to our modular construction."

PapaBravo rolled out its zero-emission 1-tonne electric mining trucks in 2011. Today, all potash mines in the province use them.

PapaBravo has continued to innovate with new types of vehicles for various types of mines around the world. Last year the company moved into a new 40,000 square foot facility and hired "a mixed bag of engineers, fabricators, service personnel and R&D staff." Byrns says 28 of the 30 people now on staff were hired directly because of the mining industry. He also emphasizes the efficiencies of using the right consultants and suppliers. He hired Lester Cey of LPC Consulting Limited to help expand markets because "he had the contacts we didn't have."

Regardless of the company's success, Byrns' attitude to being a supplier is the same. "Even though we're as good as or better than anyone else in the world right now, it's still a horse race. We might be first out of the gate, but there's still a long way to go. We have to continue to focus on the things that got us to this point." His advice to entrepreneurs hoping to become part of mining's immense supply chain? "Prove your worth, then the PO will happen."



Badger-EV, 6 passenger crew cab, 1 ton 4x4 work truck at PCS Cory.



Armadillo-EV, 12 passenger personnel carrier, 1 ton 4x4 at PCS Allan.

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## BEYOND THE BIO

ROSS MCELROY, P. GEOL  
PRESIDENT & COO  
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In each edition of ORE, we go beyond the official bios to give our readers insight into the leaders of Saskatchewan's mining and exploration companies.

When Ross McElroy began his career as a geologist in 1987, a common belief in his profession was that a geologist would be lucky in his career if he participated in even one major exploration discovery. McElroy has been part of several, the most recent being the Patterson Lake South uranium deposit. While all of the current producing uranium mines are on the eastern flank of the Athabasca Basin,

the Patterson Lake South deposit is along the virgin southwest part of the Basin, opening up a prospective new area of exploration. The discovery of this deposit was one of the reasons he received The Prospectors & Developers Association of Canada's 2014 Bill Dennis Award as the prospector of the year. The award came on the heels of another prestigious honor a month earlier, when McElroy and Fission Uranium's CEO Dev

Randhawa were named The Northern Miner Magazine's 2013 Persons of the Year.

Success came early for Ross. Shortly after starting his career with Saskatchewan Mining Development Corporation (now Cameco Corporation), he was part of the team that discovered McArthur River, which



turned out to be the world's largest high-grade uranium deposit. Even that success, though, wasn't enough to quell his urge to "try new things."

"I did mental gymnastics over deciding whether or not I should resign from SMDC," Ross recalls. "When I handed in my resignation to my manager, though, he gave me the best advice I've ever heard. He told me to never look back. Make your decision and then go for it."

Ross took that advice to heart. "You don't want to burn bridges. Do your best in your current position and make the most of it. But don't be afraid to move on, to take risks." That philosophy has helped him steadily advance in his career, along with a natural ability to talk to people with diverse interests.

"Your audiences are probably more varied than in almost any other industry," Ross says. "You're talking to scientists, investors, labour groups, local communities and many others. If you're going to lead a mining and exploration company, you've got to know what drives these people, what interests them. That's especially true for a junior company, when you're essentially the chief cook and bottle-washer!"

Meeting diverse people and experiencing diverse cultures around the world is part of the reason he has retained his love for the mining industry. "I've been lucky to work with the right people and the right teams at good companies. I love the camaraderie."

For Ross, his favorite discovery is the next one. "Success breeds success," he says. "Geology is a frontier science. There's so much to see, to explore. I'm like a treasure hunter."



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# TAGGING ALONG

DARREL BURNOUF  
MANAGER, BUSINESS DEVELOPMENT  
& NORTHERN AFFAIRS  
CAMECO CORPORATION

Darrel Burnouf (at left) chats with Gary Tinker of Pinehouse, just one of many communities in northern Saskatchewan that Cameco's manager of Business Development and Northern Affairs will visit during the year.

Ask Darrel Burnouf to describe a typical day on the job and he'll tell you "it's all over the map."

As Cameco Corporation's manager of Business Development and Northern Affairs, Darrel routinely spends two days a week on the road meeting stakeholders all over northern Saskatchewan; this can be a challenge in itself considering the condition of northern roads in some seasons.

The core of Darrel's job involves meeting northern community and business leaders, suggesting ways in which they can improve their

ability "to provide high quality, cost-competitive goods and services to Cameco's northern operations."

He currently works with about 40 different northern suppliers, with the sum total of these business relationships with Cameco amounting to more than \$450 million in 2013. This is money that percolates through the northern economy through jobs for northerners and profits to communities with stakes in these companies, Darrel points out.

One recent success has been the way Cameco has worked to encourage the development of community-

owned Pinehouse Business North which has gone from a small start-up offering casual labour to now having the capacity to tackle construction, earth moving and environmental waste management.

"As someone born and raised in the north, I find great satisfaction in building capacity and opportunity, not for just northern businesses, but northern people in general," Darrel says.

In addition to business development, he now looks after numerous initiatives and issues related to northern affairs. These duties includes working

as a liaison with Cameco's northern stakeholders to bolster ongoing business development, workforce development and community investment. Darrel says it is all part of Cameco's efforts to work with northerners on a shared vision for the benefits that can accrue through collaborative efforts with Cameco and other uranium industry partners.

Darrel's own career roadmap reflects the capacity building he now stresses within his present position. He started as a lab technician at Cameco's Key Lake mill, commuting from his home town of Beauval. During this time he took

distance education classes in business administration, which led to a position with the Northern Enterprise Fund and later election to the Beauval town council.

His interest in the both public and private sectors made him the ideal candidate to become the community's economic developer for seven years. His interest in business later inspired him to start a construction company which he ran until returning to Cameco in 2008 as manager of business development. The northern affairs portfolio was added to his responsibilities last year.



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*An airline pilot was once asked to describe the most dangerous part of his job. He answered, "The drive to the airport."*

Ask a Saskatchewan mining employee what the top priority is at their company, and they will answer "safety." Working together, governments and the industry have developed comprehensive programs, policies and procedures to safeguard employees. More and more, those measures are extending beyond the job site.

"One of my greatest safety concerns is the two-hour commute for our employees between Saskatoon and our Jansen Project," notes Ewan Alexander, vice-president of Health, Safety and Environment at BHP Billiton Canada Inc. To mitigate the risk, all of BHP Billiton's vehicles in the province are five-star rated for safety, are highly visible on the road, carry a complete emergency kit, and are fitted with an In-Vehicle Monitoring System

(IVMS). The IVMS monitors the operation of the vehicle and will sound an alarm if the driver is not following the speed limit. The IVMS also allows the company to quickly locate the vehicle if a driver were stranded on the highway in a blizzard and out of cell phone range, or in some other form of difficulty. Furthermore, the company uses a system of journey management where employees phone BHP Billiton's security before embarking on a road trip, indicating where they are going, the number of passengers, and the expected time of arrival. If the driver does not phone again at the ETA, security personnel will try to contact them, and if necessary, find out why the employee did not arrive. "Fortunately, most incidents are simply the driver forgetting to call in when he or she arrives, but the system demonstrates our care and concern for our people," says Alexander. "We look out for each other."

Going beyond their individual safety programs, mining companies are working together with other industries and government to promote safety for everyone. The most recent outcome is a Distracted Driving television commercial and related

billboards produced by the Saskatchewan Workers' Compensation Board of Saskatchewan (WCB) through their partnership in WorkSafe Saskatchewan. Key to the campaign's development was input from the Mission: Zero Highway Safety Committee. Formed just over a year ago, the Committee includes representatives from the mining industry including the Saskatchewan Mining Association; the oil and gas industry; heavy construction; the trucking industry; and Safe Saskatchewan, the non-profit organization mandated to promote safety on and off the job.

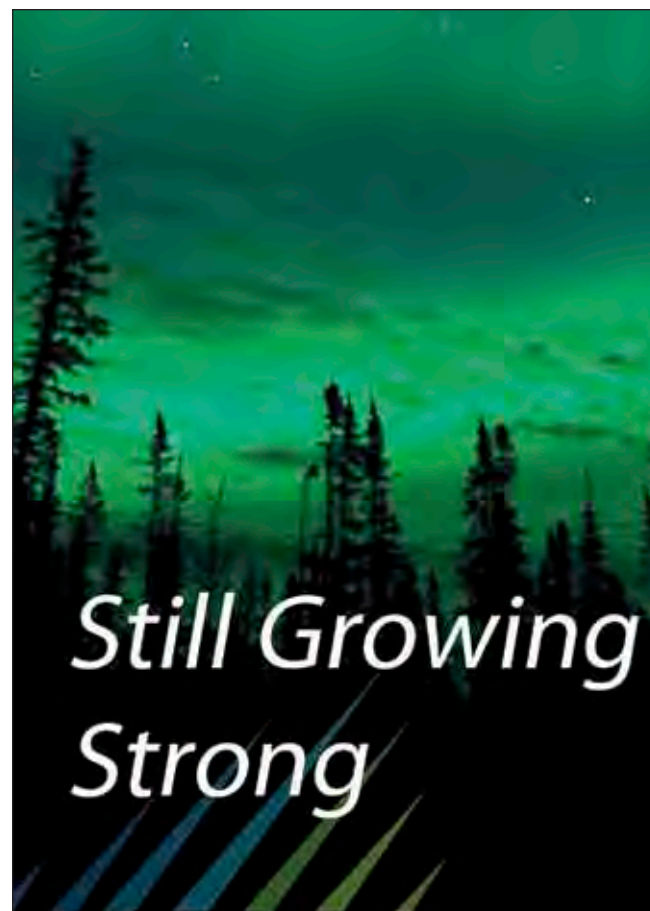
"Distracted driving has surpassed impaired driving as the number one cause of highway collisions," explains Annette Goski, manager, Prevention Services at WCB. "The ad campaign was developed by WorkSafe Saskatchewan with input from all members of the committee and began airing in the province in September of 2013. Committee members provided research for the creation of the ad including collision information about common situations, time of day, road conditions, work environments, vehicles, driver ages and habits."

Goski explains the correlation between a public safety awareness campaign and involvement of the mining industry and others on a committee. "In 2012, Saskatchewan had the highest number of highway fatalities in over twenty years. It was also experiencing unprecedented growth in the mining and oil and gas sectors, which was increasing traffic in specific areas of the province, particularly highways in the southeast and northwest." The Mission: Zero Highway Safety Committee is yet another example of how mining companies who are otherwise competitive work together when it comes to safety. Through the Committee, they can share their information, support each other's efforts, and avoid unnecessary duplication in their effort to prevent motor vehicle and other highway collisions.

It is also an example of how emphasizing safety, be it at the workplace or wherever, ultimately promotes safety for everyone. "We are all drivers, parents and grandparents," says Goski. "Everyone wants safer travels on the highways in Saskatchewan."







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## ORE BITS

Sources: Facts & Figures 2013 (Mining Association of Canada), and Natural Resources Canada.

*Thanks to its rich geology, Canada is one of the largest mining nations in the world, producing more than 60 minerals and metals.*

### Mining Facts

Minerals and metals are the building blocks of the computers and smartphones we rely on, of the vehicles and public transit that get us places, of the buildings where we live and work, and of green technologies that help make the world a more sustainable place.

Just as we as individuals depend on mining to support our daily lives, Canada relies on the industry to keep the economy humming. Mining is one of Canada's most important economic sectors and a major job creator.

### Did you Know?



Those who work in mining enjoy the highest wages and salaries of all industrial sectors in Canada with an average weekly pay of \$1,559, surpassing the earnings of workers in finance, manufacturing, construction and forestry.



Mining is the largest private sector employer of Aboriginal peoples in Canada on a proportional basis, and employment is poised to increase.



More than 418,000 people across Canada work in the mining and mineral processing industries.



Canada has one of the largest mining supply sectors globally with more than 3,200 companies supplying engineering, geotechnical, environmental, financial and other services to mining operations.

### An Economic Engine



- Mining contributed \$52.6 billion to Canada's Gross Domestic Product (GDP) in 2012.
- The mining industry's payments to Canadian federal and provincial governments total \$71 billion in taxes and royalties over the last decade (2003-2012).

- The industry accounted for 20.4% of the value of Canadian goods exports in 2012.
- Canada's value of mineral production was nearly \$47 billion in 2012.





## A Global Leader

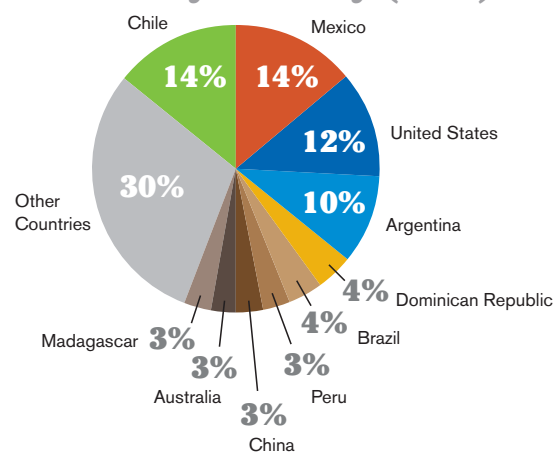
- Canada ranks in the top five countries in the global production of potash, uranium, aluminum, cobalt, titanium, tungsten, cadmium, diamonds, platinum, sulphur and nickel.
- Almost 60% of the world's public mining companies are listed on the TSX and TSX-Venture Exchanges, and 70% of the equity capital raised globally for mining companies is raised on these exchanges.
- Canadian-headquartered mining companies accounted for nearly 37% of budgeted worldwide exploration expenditures in 2012, and Canada has been the recipient of the largest share of global exploration spending since 2004.
- Globally, Canada is recognized for its leadership in safety and sustainability. Mining companies in Canada were the first in the world to develop an externally-verified performance system for sustainable mining practices with the creation of MAC's Towards Sustainable Mining initiative in 2004.

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### The top commodities carried by Canadian Rail in 2011 (by volume)

- Minerals and metals (52%)
- Grain (13%)
- Forest products (11%)
- Chemicals (5%)

## Canadian Mining Assets Abroad by Country (2012)



## Mineral Exploration in Canada – source Natural Resources Canada

- Mineral exploration in Canada in 2014 is projected to be \$2.1 Billion.
- 2013 mineral exploration expenditures of \$2.3 Billion in Canada contrasted sharply with initially planned expenditures of \$3.3 Billion and actual 2012 expenditures of over \$3.7 Billion. The rapid meltdown of optimism is explained by 3 factors:
  - The price of gold losing its glitter through the course of 2013.
  - Senior companies reduced exploration expenditures to improve their balance sheets.
  - A very unreceptive market for financing the activities of junior mining companies.

- Ontario, British Columbia and Quebec are the top Canadian destinations for exploration and deposit appraisal capital.

- Gold is the leading target for exploration, accounting for roughly 40% (\$868 million) of proposed expenditures in 2014, followed by base metals and uranium.

- Senior companies will account for most of the exploration and deposit appraisal spending in Canada in 2014, investing \$1.4 Billion compared to junior companies spending intentions of \$777 million.



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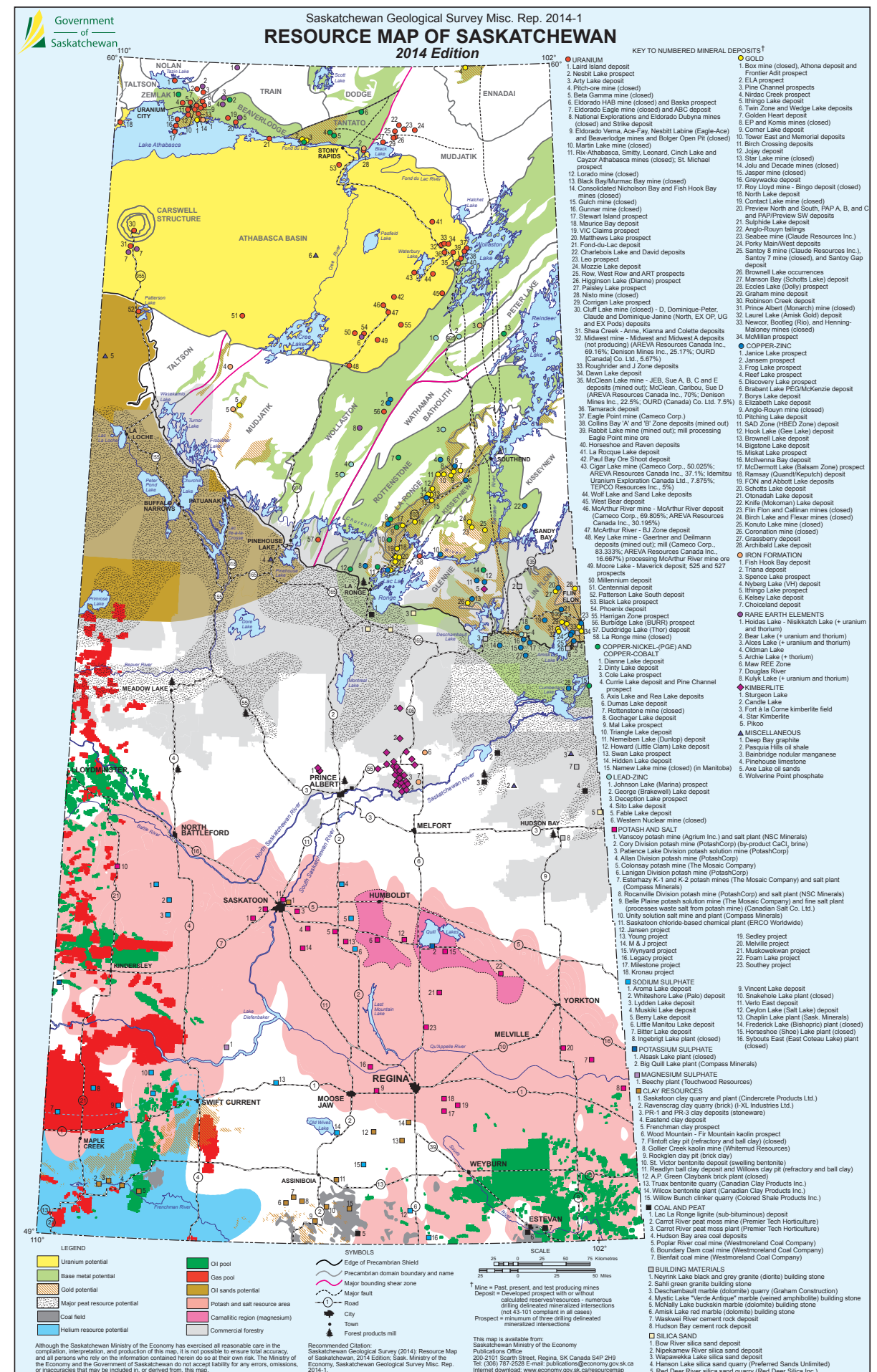
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