



# **THE PROSPECTOR**

RESOURCE INVESTMENT NEWS

March/April 2016

A RESURGENT  
**ECUADOR IS FRONT-AND-CENTER**  
ONCE AGAIN **AT PDAC 2016!**

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# A RESURGENT ECUADOR IS FRONT-AND-CENTER ONCE AGAIN AT PDAC 2016!

By Chris Temple

**T**he South American country of Ecuador is again this year one of the country sponsors of PDAC. Ecuador Day –at which government ministers and private companies alike will be informing attendees about the recent events and the vast opportunities in this beautiful country–will be on Monday, March 7.

And it's more appropriate than ever that Ecuador has a key presence at the largest mining-related symposium in North America. It's my view that it arguably represents the best "country story" in this hemisphere going forward where both copper and precious metals exploration are concerned. Yet it's a story that is still largely either misunderstood, or entirely unknown.

When you mention Ecuador to many an investor and even some analysts who have not kept up with recent developments there, you'll often get a negative response. The average person only remembers "news" that is in fact going on a decade old: that being the country's Mining Mandate of April, 2008 which, for a short time, essentially put a hold on exploration activity in the country and further caused concessions which had been granted under previous law to be effectively canceled.

The motivation of President Rafael Correa, newly elected at the time, and the country's legislature was legitimate. Ecuador, which had up until then been a "hot" destination for exploration (anchored by the discovery of the world class Fruta del Norte gold project by the former junior miner Aurelian Resources, which led to a staggering hundredfold increase in its share price at one point) was in some eyes being abused. By one account, foreign

companies and even some local geologists were getting concessions from the previous government on the cheap, spending little money locally for exploration and attempting to "flip" them–cash out quickly–without ever having engaged in much legitimate work that would eventually lead to development, or benefit Ecuador and its people. Fair enough to try to solve this problem.

***But in retrospect, the government initially used a sledge hammer where a scalpel might have been more appropriate.*** To their credit, Correa and his administration quickly realized that Ecuador needed to craft new, fair laws and regulations which would correct the past problems while at the same time

making it conducive for foreign companies to want to invest in the country. By 2011, an effective moratorium on activity caused by the 2008 mandate was lifted.

Most important, the government over two years ago hired the international consulting firm Wood Mackenzie to help it craft streamlined, fair and understandable regulations that would resurrect Ecuador once and for all as a reliable, stable and even favored destination for foreign mining companies. That process has been furthered nicely, as the recent announcement of a long-awaited deal between Lundin Gold (TSX-LUG; OTC-FTMNF) and Ecuador over the terms of

***And it's more appropriate than ever that Ecuador has a key presence at the largest mining-related symposium in North America***



In the above photo, Chris Temple of The National Investor (left) confers with Ecuador's Minister of Mining, Javier Cordova (center) and Cornerstone Ecuador S.A.'s Yvan Crepeau (right) in Minister Cordova's Quito office.

the development agreement for the Fruta del Norte deposit indicates.

One of the many press reports of this can be read at <http://www.canadianminingjournal.com/news/gold-lundin-secures-mining-licence-for-fruta-del-norte/>. And in short, the terms on royalties, tax structure and more were very favorable; better than those of us who have followed the country's overall evolving regimen had expected. President Correa, praising the deal with Lundin in one of his weekly addresses to the nation, reiterated his support for the responsible and soon further development of his country's resources. You can read of that at [http://www.ecuadorinmediato.com/index.php?module=Noticias&func=news\\_user\\_view&id=2818794762&umt=presidente\\_correa\\_considera\\_a\\_mineria\\_como\\_una\\_claves\\_para\\_superar\\_pobreza\\_en\\_ecuador](http://www.ecuadorinmediato.com/index.php?module=Noticias&func=news_user_view&id=2818794762&umt=presidente_correa_considera_a_mineria_como_una_claves_para_superar_pobreza_en_ecuador). (You can click on the "translate" function if necessary as the story is, of course, in Spanish.)

During my recent trip to the country, I had the opportunity to visit with numerous ministers who directly oversee the renewed development of Ecuador's largely untapped mineral resources. I go into considerable detail on my various conferences with them and excursions in a far broader special issue of The National Investor dedicated to Ecuador and several company-specific opportunities there.\*

For now, suffice it to say that I saw first-hand an incredible situation that should get any investor's heart pumping faster. In short, in Ecuador, we have a country with:

- \* among the most advanced communications, transportation and other infrastructure of any country in South America.
- \* abundant fresh water needed for exploration and development of any industry, including mining.
- \* with the commission of the country's several new big hydroelectric projects, some of the cheapest electric utility rates in South America

- \* a renewed, pro-active effort to re-engage with foreign mining companies AND...
- \* the LEAST explored and developed mineral assets of any country in South America.

More good news is coming as the country looks to unlock additional concessions for new exploration. A letter of intent announced last April between ENAMI EP, Ecuador's state mining corporation and project generator Cornerstone Capital Resources, Inc. (TSXV:CGP; OTC:CTNXF) is likely to have been formalized by the time you read this. The deal sets up Cornerstone as initial project generator and a "gatekeeper" of sorts; the company has already identified, by virtue of its long exploration history in Ecuador, several prospective areas it will ultimately seek to J.V. with ENAMI and other companies.

Indicative of how the environment for exploration since the lifting of the moratorium in January, 2011 has been better than advertised, we have the example of the Cascabel concession in the northwest part of the country. This concession cost Cornerstone in 2011 the princely sum of about CS80,000; CS20,000 to buy the shares of the local company which held it and another CS60,000 to do the legal and environmental due diligence necessary. In under two years, Cornerstone took these concessions, which had until then only exhibited some stream sediment anomalies, to a fully permitted and drill-ready advanced exploration project.

Australia's SolGold plc (AIM-SOLG) joined Cornerstone as a senior earn-in partner (with now an 85% interest in the project; Cornerstone's 15% remains a carried interest through to the completion of a feasibility study) and has further advanced but one of nearly a dozen potential copper/gold porphyry targets at Cascabel to a point where 2016 will likely see an initial inferred resource estimate for the Alpala target there. Drill results to date have identified an extremely large (and still growing) area which one particular world-renowned expert on such porphyries believes could be perhaps THE biggest new such discovery in the world, let alone in the Andes.

I strongly encourage you to check out a great video overview put out by SolGold of the Cascabel project; you can view it at <http://www.brrmedia.com/event/141121/solgold-team?platform=hootsuite>



Here, Cornerstone's Crepeau (left) and Temple (right) visit with Arsecio Tobar (center), the President of the local community of Santa Cecelia, located within the Cascabel concession area.

Beyond the fairly widely-held belief of both government and private sector people I spoke with that Cascabel may well prove to contain the next world-class, development-ready metals deposit in Ecuador (following up Fruta del Norte), Cascabel is a microcosm of the broader story that Ecuador is retelling the global mining and investment community.

Already, there are quantifiable benefits for the local people due to the exploration activities and expenditures thus far by Cornerstone and SolGold. The quaint hillside village of Santa Cecelia, located within the concession area, has had a boost in employment. The companies have funded new buildings, repairs, a community greenhouse and nursery, and much more. The government has been very eager to cooperate and further things along; while I was there, construction was being completed on a newer road that will join the community directly to the most active drill sites on the concession. When I had the opportunity to visit with the village's "president," Arsecio Tobar, I found a local leader beyond excited at the further benefits expected to come, which will help his economy and people.

In summary--and contrary to some lingering, misinformed reports--Ecuador seems to be putting the finishing touches on crafting what I believe to be an effective and wise balance that recognizes each necessary component of mineral development; one that is sufficiently inviting and rewarding to foreign investors while at the same time making sure an equitable portion of the eventual rewards and income devolve to people in local communities.

\* Chris Temple has authored a more comprehensive report on Ecuador beyond this brief overview. If you'd like a copy, e-mail him at [chris@nationalinvestor.com](mailto:chris@nationalinvestor.com).



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# GOLD HUNTING IN THE AMERICAS

**Goldsource Mines, Inc. Proves Benefits of Thinking Globally, Hiring Locally**

By Christian Vakenti

**G**uyana, a country on South America's North Atlantic coast, is defined by its dense rainforest. English-speaking, with strong traditions of cricket and calypso music, it's culturally connected to the Caribbean region. Its capital, Georgetown, is known for its British colonial architecture. And for mining companies on the hunt for gold, it's gaining favoured status as a hidden gem.

"Their system of law is based on the British," Goldsource Mines, Inc. (TSX.V: GXS) President Yannis Tsitos told *The Prospector*. "Their government is very supportive of us, very helpful and their bureaucracy is straight-forward and easy to navigate. It's a wonderful place to do business – it's the perfect place to look for gold in the Americas."

Goldsource has begun the commissioning phase on its Eagle Mountain Gold project, located 230 km southwest of the capital. From there, secondary transportation is easily accessed by Yannis and his crew – the project lies just 10km from a sizable town of 3,500 people, which features a commercial air strip. It is from this town, called Mahdia, and the surrounding areas, that Yannis recruits his miners.

"We have an excellent management team, sure," says Yannis, "and I can go on about how amazing these guys are, the years of experience they bring to the table, the myriad successes they've had – and that's worth talking about. But we temper that, rather we augment that, with local talent on the ground, guys who really know the lay of the land and are equally awesome at what they do."

During the initial phases of struggling to get Eagle Mountain up and running, Yannis says they've employed about 50% of their crew from the local community, with 36 people working full time to bring the project online, "Plus three ex-pats," says Yannis.

"Back here in Vancouver, we've got Scott Drever at the helm, as CEO," says Yannis. "He brings 45 years of geological expertise. And Eric Fier as COO, there's another 30 years of proven track record. And a well-rounded team of other associates that drive the management end of things. But we're very reliant on our Guyanese experts in the field – the miners who took part in the initial discoveries and have helped to bring the operation along."

The blend of thinking globally and hiring locally has allowed Goldsource to bring the Eagle Mountain project to completion both on time and under budget.

***The blend of thinking globally and hiring locally has allowed Goldsource to bring the Eagle Mountain project to completion both on time and under budget.***

"We budgeted USD\$5.9 million to get us this far," says Yannis. "But we actually did it for less than \$5. About 18% less than what we'd set aside. And all on schedule." The project has an existing NI 43-101 resource of 188,000 indicated and 792,000 inferred gold ounces. It is fully financed for phase 1 construction, owing to a non-brokered private placement from December 2014, which garnered a total of \$7,070,725 through the sale of 47,138,166 units at a price of \$0.15 per unit. The company is debt free as of December 31, 2015.





“We completed a PEA (Preliminary Economic Assessment) back around September of 2104,” says Yannis, “based on that, phase 1, where we are now, consists of initially a 1,000 tonnes per day open pit - gravity plant ramping up to 3,000 to 4,000 tonnes per day in roughly 4 years, maybe faster. Starting off, we’ve got one 10 hour shift we’ll be running, but we plan on adding another.”

More local hires – and fatter bottom lines for Goldsource.

“Estimate for an 8 year mine life, or putting it another way, 168,700 ounces of gold,” says Yannis, “with estimated preproduction capital costs of US\$5.9 million and cash operating costs of \$480 to \$600 per ounce of gold.”

“This is something we have stated before: in 2016 we are excited by the prospect of becoming a low cost producing gold company.”

Profits from phase one will not only fund successive phases, but other ventures as well.

“We’ve got plans for gravity tailing inventory – to increase recovery and production,” says Yannis. “But the real expansions will come when we acquire similar projects within the Guyana Belt – and then we apply the same development model to them. The system builds, self-funds and feeds itself. Growth is deliberate, organic and carefully staged so that momentum accrues naturally, while project is derisked”

Yannis credits a confluence of factors coming together at just the right time to make Eagle Mountain a success.

“The timing is really, it’s really great,” he says. “The ease of construction, even improving the road and the necessary infrastructure improvements, everything couldn’t have gone better. Working with the Guyanese government and its people has been tremendously advantageous for us. With all these factors in play, we knew it was not a matter of if we’re going to make it a mine, but when.”



Original Discovery Crew



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## WHY GOLDSOURCE MINES?

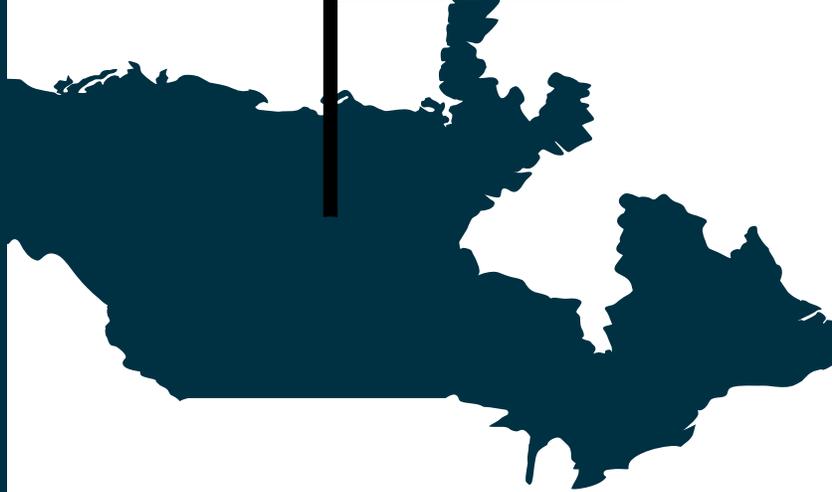
- **Eagle Mountain Gold Mine now in commissioning phase** – production imminent
- **Mine construction on-time & under budget** – completed January 2016
- **Low Opex expected** (\$600 – \$700 all-in sustain. cash cost) \*
- **Compelling economics** (63% aft-tax IRR) \*
- **Guyana, South America** – attractive mining regime

\* Financial parameters based on independent NI-43-101 Compliant PEA, filed July 2014

# A CRUDE CORRELATION WITH CANADA'S CURRENCY

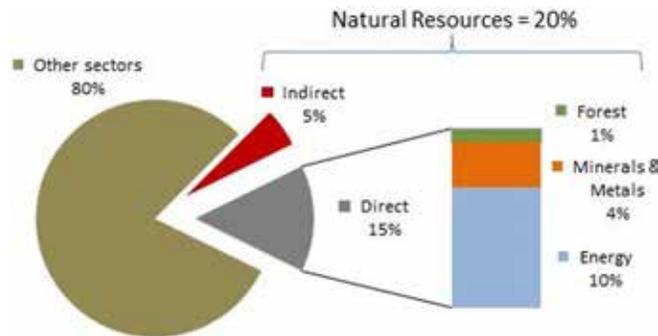
By Mickey Fulp

Canada is the world's fifth largest oil and gas producer

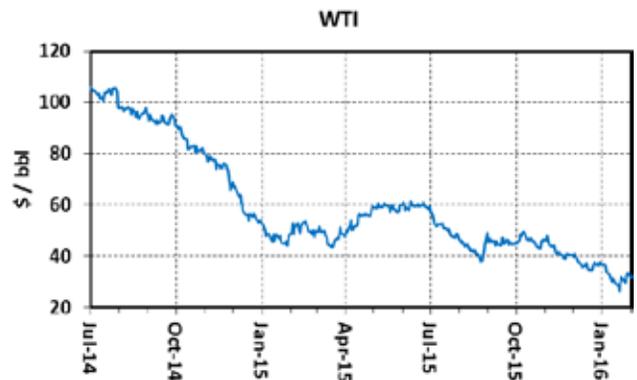


Canada is the world's fifth largest oil and gas producer and its energy export revenues are a significant part of the economy. In 2014, energy contributed 10% to Canada's GDP, 28% of its export revenues were from energy products, and 97% of those energy exports were destined for US markets:

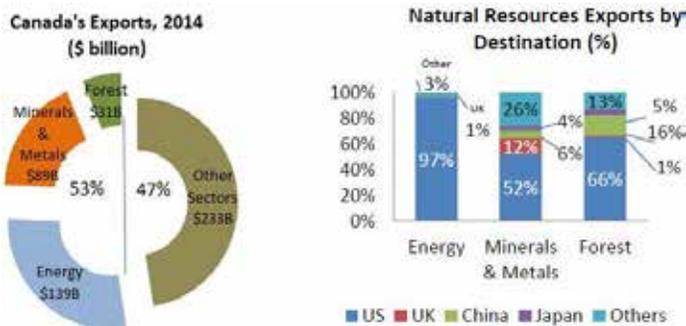
## Contribution to 2014 Nominal GDP



At that juncture, WTI was still around trading at \$90 a barrel. However, it has continued to spiral downward with few respites over the past 19 months:



## Sources and Destination of Export Revenues



(Source: Natural Resources Canada)

In early July 2014, the North American benchmark for oil, West Texas Intermediate Crude (WTI), traded at \$106 a barrel. Once the US dollar index (DXY) started its big run above 80, the price of oil began to drop and by the beginning of Q4 2014, a worldwide bear market was in full force.

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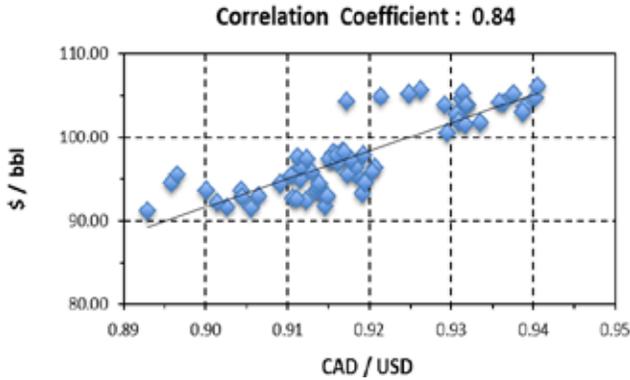
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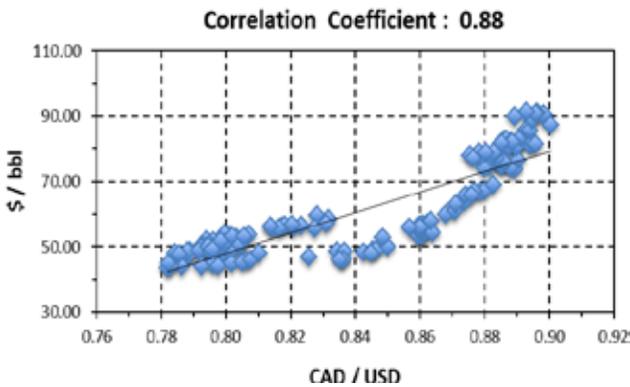


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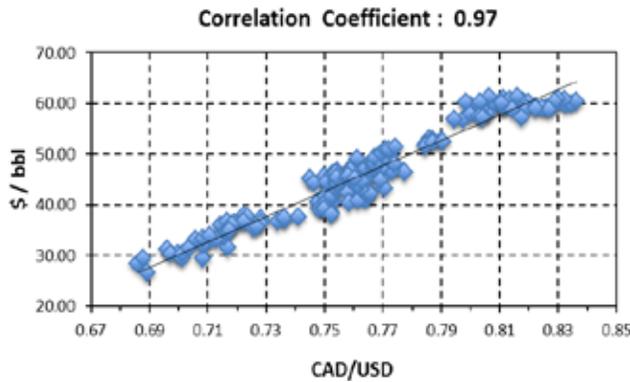
Given Canada's reliance on energy exports, it is not surprising there has been a strong positive correlation between the price of West Texas Intermediate Crude and the value of the Canadian dollar since oil began to fall. Here is the correlation chart from July 1 to September 30, 2014:



Once the bear market for oil hit hard in Q4 2014, this correlation became even stronger. This is the chart for October 1, 2014 to April 30, 2015:



Moreover, as the price of North American oil has continued to decline, the loonie has marched even more in lockstep. Here is the correlation chart from May 1, 2015 to February 4, 2016:



The increasingly positive correlation of crude and the Canuck currency likely reflects the decline in oil's contribution to Canadian GDP and export revenues for 2015.

This relationship between crude oil and the Canadian dollar reminds us of the strong dependence of that country's economic health on natural resources extraction and in particular, its petroleum production.

Simply put: As goes oil, so goes the loonie, and so goes the Canadian economy. Until the worldwide glut of crude oil is remedied, its fiat currency will undoubtedly remain weak.

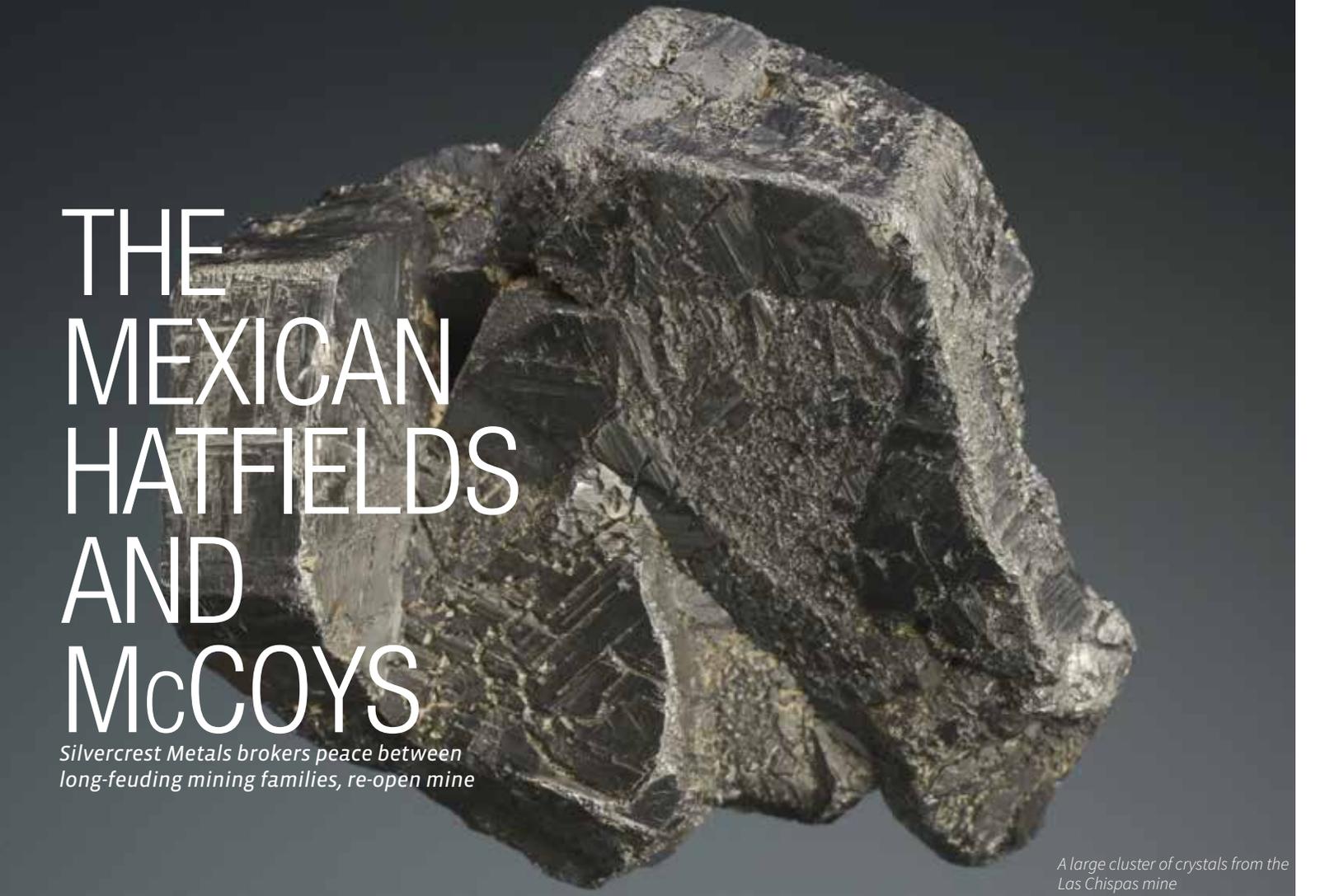
And while that's bad for most Canadians, it is good for Americans who like to go shopping on Robson Street.

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# THE MEXICAN HATFIELDS AND McCOYS

*Silvercrest Metals brokers peace between long-feuding mining families, re-open mine*

*A large cluster of crystals from the Las Chispas mine*

*By Christian Vakenti*

**“W**ell, we spent a lot of time on porches, drinking tea and lemonade,” recalls Silvercrest Metals, Inc. (TSX.V: SIL) (OTC: SVCMF) CEO Eric Fier in a phone interview with *The Prospector*.

The Las Chispas property in Sonora, Mexico had been the subject of a protracted and virulent legal battle which exhausted both the funds and the will of two local families. Said families had come to loggerheads over the mine, after a pair of grandfathers - the original founders - had passed away.

The surviving children didn't exactly see eye to eye on how to proceed (“That's putting it lightly,” says Fier), and consequently the property lay fallow for many years.

Until, that is, Silvercrest Metals began the delicate operation of unweaving decades worth of mistrust and navigating the legal channels necessary to bring the property back online.

Silvercrest was formed following the acquisition of SilverCrest Mines Inc. (notice the distinction, Silvercrest Metals vs Silvercrest Mines) by First Majestic Silver Corp, which remains a shareholder in SilverCrest Metals.

Their combination of highly experienced management team with a proven track record for picking winners is what they're banking on to steer Silvercrest in the search for new discoveries. Las Chispas, in addition to their five other projects, looks like it might be the repeat of their previous success that the well funded team (approx. \$6.7 million CDN in the bank) has been trying for.

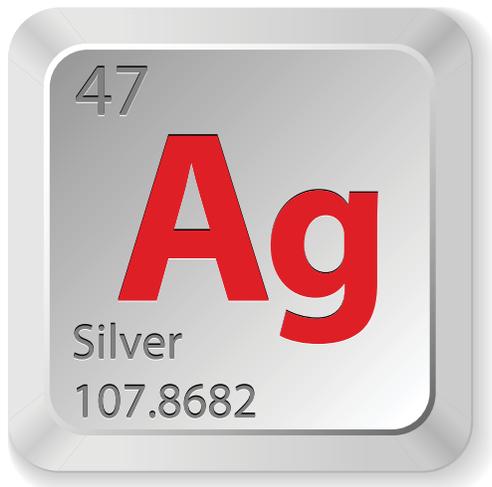
***[...] approximately 120 million ounces of silver and 200,000 ounces of gold were cumulatively produced from the property. Since 1930, no significant work has been completed on the property.***

Located approximately 180 kilometres northeast of Hermosillo, Mexico, the Las Chispas property consists of 17 concessions totalling to 1326.78 hectares.

In the year 1640, rich silver veins were discovered near Arizpe (a small community 12 km to the north) by soldiers under the command of Pedro de Perra. However, the property did not receive any notable exploration or production until the late 1800s. From 1880 to 1930, several mines on the property had intermittent production. According to publicly filed documents, approximately 120 million ounces of silver and 200,000 ounces of gold were cumulatively produced from the property. Since 1930, no significant work has been completed on the property.

During the early 1980s, a local Mexican company reprocessed old waste and tailings dumps from Las Chispas. Processing was done by vat leaching but there are no production records available.

The Las Chispas Mine is known for its world-class silver mineral specimens including polybasite, stephanite, native silver and pyrrargyrite. In fact, specimens are on display in private collections and museums worldwide.



Mineralization occurs in 0.5 to 5 metre wide veins with adjacent stockwork and breccias trending northwest-southeast for 1 to 1.5 kilometres. Depth from surface of known mineralization is estimated at 300 metres. Fourteen epithermal veins have been previously defined on the

property of which 3 have had notable production. From public information, the Las Chispas mill production between 1908 through 1911 was approximately 25,000 tonnes grading 35 gpt gold and 4,500 gpt silver totaling an estimated 25,000 ounces of gold and 3.2 million ounces of silver. Several kilometres of underground workings exist on the property and are partially accessible.

“It took a lot of patience,” says Fier, “but we were confident that if we could bring these parties to the table, clean up the old legal documents and forge a new partnership, that it could be hugely lucrative and successful.

We’ve done all that. Now we’re on to the part where we prove the discovery and begin extracting the resource.”

Targets for modern exploration include drilling of near-surface (0 to 100 metres) vein extensions, depth (200 to 400 metres) extensions of historical producing areas, potential open pitable stockwork and breccia zones, and possibly reprocessing remaining waste and old tailings dumps.

SilverCrest’s activities at the tail end of 2015 include conducting general exploration, mapping, sampling and geochemical analysis. A news release detailing those results is expected soon, but was unavailable at the time of this writing.

Based on results of the general exploration, the next phase in the plan is to conduct a drill program in Q1 of 2016 to test known targets in the Las Chispas area.

“The obvious targets, what I’d call the low hanging fruit, have been plucked,” says Fier. “Now we get down to the business of really extracting the resource. This is the area that our team excels in. This is why we came here to Sonora. And this is where we’ll either repeat the successes of Silvercrest’s past – or greatly exceed them.”

**SILVERCREST**  
Metals Inc.

### Why SilverCrest Metals?

- Management proven track record in all aspects of the precious metal industry (including development of junior exploration companies)
- Strong cash position
- Good exploration potential in historic mining districts
- Significant database from previous due diligence work for potential acquisitions
- Drilling has been completed on the Huasabas Project and is scheduled to start on the Las Chispas Project in Q1 2016

*Las Chispas Area (aerial view of the project location)*

*Huasabas Project*

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# THE CHANGING WORLD OF URANIUM MINING

*A Monday Morning Musing from Mickey the Mercenary Geologist*

By Mickey Fulp

In last week's offering, Brien Lundin and I posted a comprehensive report on uranium and listed a variety of North American-focused exploration, development, and mining companies that stand to prosper as the price of uranium increases (Mercenary Musing January 18, 2016). Today, I document significant changes over the past ten years in both where and how primary supplies of uranium have been mined.

Many of these changes can be directly attributed to the wild swings in the price of uranium from 2004-2014.

The uranium spot price soared from \$10/lb U<sub>3</sub>O<sub>8</sub> in 2004 to a peak of \$135 in the spring of 2007 and then collapsed back to \$40. The exponential rise and fall was driven by hedge funds, utilities, and traders competing in a speculative frenzy for physical supplies of yellowcake over nearly two years. Uranium price volatility foreshadowed the parabolic rise and fall of oil, copper, gold, and all other world-traded hard commodities that culminated late in the global economic crisis of 2008-2009.

The spot price began moving up from \$40/lb in the summer of 2010 and briefly reached \$73 in February of 2011 immediately prior to the Fukushima incident. It fell to as low as \$28/lb in the summer of 2014 before settling in the \$35-\$38 range for most of 2015.

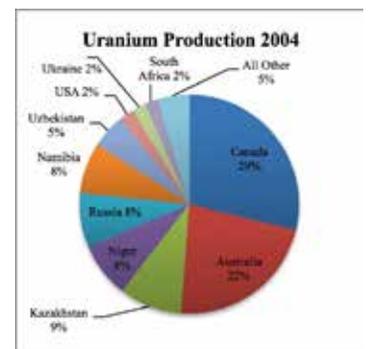
In the series of tables and charts below, I present the top ten uranium producing countries and ten largest mines in 2004, 2009, and 2014, document significant changes, and offer factors contributing to the

rapidly changing world of uranium mining. Data sources are the World Nuclear Association and the International Atomic Energy Association.

First up are the top ten producing countries and the nine largest mines for 2004. Note that production figures for individual mines in Kazakhstan and Uzbekistan were not available until the late 2000s. Given Kazakhstan's position as the world's third largest producer in 2004, it is likely that one Kazak mine would make the list. Therefore, I only list nine large mines for the year.

Also note that only three mines made the list over the entire ten-year period; they are highlighted in the charts below:

Top 10 Producing Countries 2004		
Country	Output (tU)	% of World
Canada	11,597	29%
Australia	8982	22%
Kazakhstan	3719	9%
Niger	3282	8%
Russia	3200	8%
Namibia	3038	8%
Uzbekistan	2016	5%
USA	878	2%
Ukraine	800	2%
South Africa	755	2%
All Other		5%
<b>Top 10 Total</b>	<b>38,267</b>	<b>95%</b>



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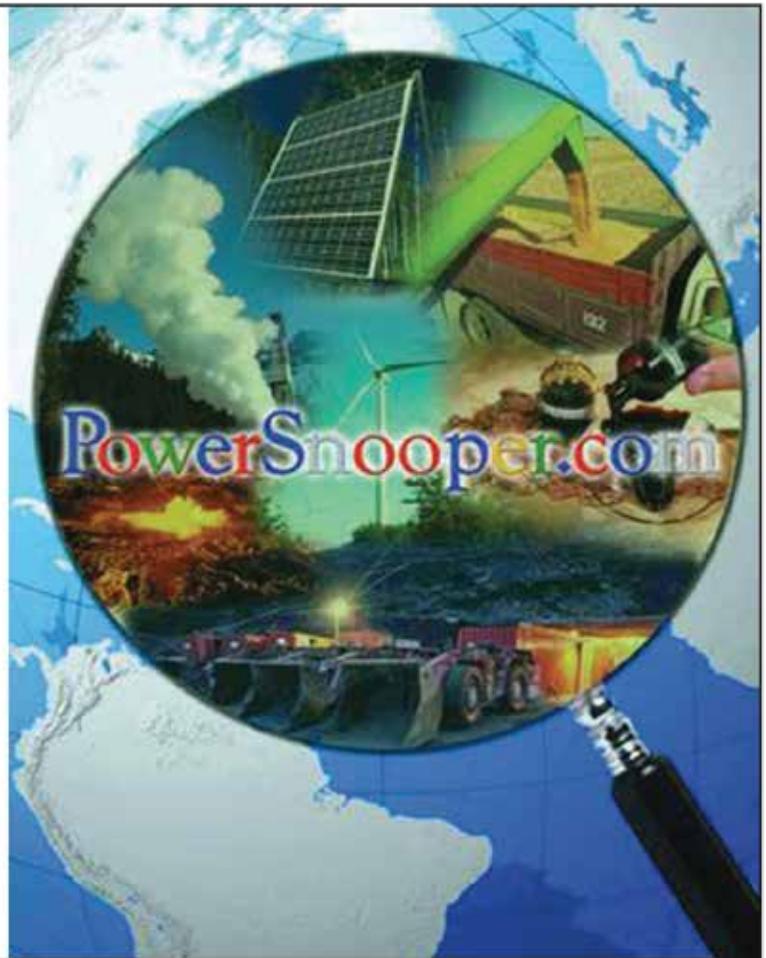
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In 2004, Canada and Australia dominated world production with a combined 51% and five of its ten largest mines; Kazakhstan, Russia, Niger, and Namibia were also significant producers.

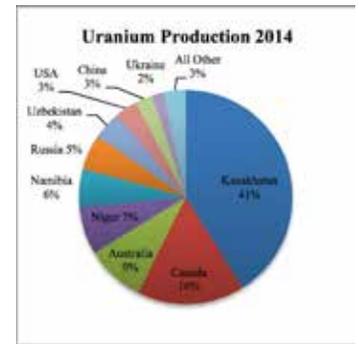
Lastly, here are the top ten lists from 2014. The changes over just five years are astounding:

Top 9 Uranium Mines 2004				
Mine	Country	Owner	Output (tU)	% of World
McArthur River	Canada	Cameco	5965	15%
Ranger	Australia	Energy Resources Aus	3695	9%
Olympic Dam	Australia	BHP-Billiton	3143	8%
Rossing	Namibia	Rio Tinto	2577	6%
Krasnokamensk	Russia	ARMZ	2442	6%
Rabbit Lake	Canada	Cameco	1770	4%
Akouta	Niger	Areva	1683	4%
Somair	Niger	Areva	1068	3%
Beverley	Australia	General Atomics	780	2%
N/A	Kazak & Uzbek			

<b>Top 9 Mines</b>	<b>23,123</b>	<b>58%</b>
<b>World Total</b>	<b>40,178</b>	

Top 10 Producing Countries 2014		
Country	Output (tU)	% of World
Kazakhstan	23,127	41%
Canada	9134	16%
Australia	5001	9%
Niger	4057	7%
Namibia	3255	6%
Russia	2990	5%
Uzbekistan	2400	4%
USA	1919	3%
China	1500	3%
Ukraine	962	2%
All Other		3%
<b>Top 10 Total</b>	<b>54,345</b>	<b>97%</b>

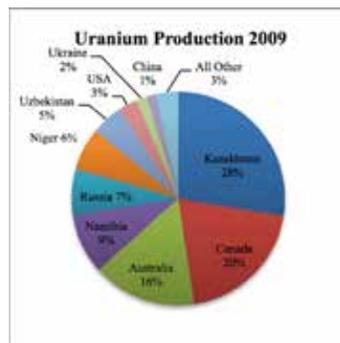


Canada's Athabasca Basin had two of the world's largest mines, Australia had three mines of diverse geological types, and Niger had two giant sandstone uranium mines. If I were to include a tenth largest mine, they would account for about 60% of world production.

Three years after the Fukushima incident in 2014, world uranium production still increased another 11%. Driving factors include the continuing nuclear build-out continued and the end of secondary supply from Russian weapons conversion. Production was increasingly dominated by ISR operations in Kazakhstan at 41% of world total and five of the ten largest mines.

Next let's look at the top ten lists from 2009:

Top 10 Producing Countries 2009		
Country	Output (tU)	% of World
Kazakhstan	14,020	28%
Canada	10,173	20%
Australia	7982	16%
Namibia	4626	9%
Russia	3564	7%
Niger	3243	6%
Uzbekistan	2429	5%
USA	1453	3%
Ukraine	840	2%
China	750	1%
All Other		3%
<b>Top 10 Total</b>	<b>49,080</b>	<b>97%</b>



By 2009, world output had increased by a whopping 26% as the nuclear energy revival was in full swing with several hundred new reactors commissioned, under construction, planned, or proposed in many countries.

Canada's production decreased 11% with most of its uranium coming from the world's largest and highest-grade mine at McArthur River, Australian production was down 37%, and US production increased by another 32% to reach its highest level since the late 1980s.

Kazakhstan had taken over as the leader in world production while Canada and Australia dropped to a combined 36%. US production was up 65% with most of that coming from small ISR operations.

Top 10 Uranium Mines 2014				
Mine	Country	Owner	Output (tU)	% of World
McArthur River	Canada	Cameco	7335	13%
Katco	Kazakhstan	Areva / Kazatomprom	4322	8%
Olympic Dam	Australia	BHP Billiton	3351	6%
Somair	Niger	Areva / Kazat	2331	4%
Karatau	Kazakhstan	Kazatomprom / ARMZ	2084	4%
South Inkai	Kazakhstan	ARMZ / Kazatomprom	2001	4%
Priargunsky	Russia	ARMZ	1971	4%
Langer Heinrich	Namibia	Paladin Energy	1948	3%
Inkai	Kazakhstan	Cameco / Kazat	1908	3%
Central Mynkuduk	Kazakhstan	Ken Data JSC / Kazat	1790	3%

<b>Top 10 Mines</b>	<b>29,041</b>	<b>52%</b>
<b>World Total</b>	<b>56,252</b>	

High operating costs and low prices combined with weather issues, industrial accidents, and/or environmental opposition and permitting difficulties resulted in the world's second and third largest mines, Rossing in Namibia and Ranger in Australia, dropping completely off the top ten list. One large mine in the Athabasca and another in Niger are also missing. The other in Niger had recurring problems with terrorism and resource nationalism. As a result, the world's large mine production dropped a bit but still contributed more than half of primary supply.

Top 10 Uranium Mines 2009				
Mine	Country	Owner	Output (tU)	% of World
McArthur River	Canada	Cameco	7377	15%
Ranger	Australia	Energy Resources Aus	4443	9%
Rossing	Namibia	Rio Tinto	3520	7%
Krasnokamensk	Russia	ARMZ	3003	6%
Olympic Dam	Australia	BHP Billiton	2981	6%
Tortkuduk	Kazakhstan	Areva / Kazatomprom	2272	4%
Somair	Niger	Areva	1807	4%
Rabbit Lake	Canada	Cameco	1463	3%
Akouta	Niger	Areva	1434	3%
Karatau	Kazakhstan	Karatau	1399	3%

<b>Top 10 Mines</b>	<b>29,699</b>	<b>58%</b>
<b>World Total</b>	<b>50,772</b>	

The way uranium has been mined over the past ten years has also undergone major changes. This table shows tonnages of uranium and percentages by type of mining method in 2004, 2009, and 2014: In-situ leaching and recovery increased by over 250% in just

Mining Method	2004		2009		2014	
	(tU)	%	(tU)	%	(tU)	%
Underground	15,790	39%	16,557	33%	*23,679	*42%
Open-Pit	11,089	28%	12,998	26%	*	*
In-Situ Leaching	7955	20%	17,166	34%	28,467	51%
Co-/By-Product	4460	11%	3681	7%	4107	7%
Heap Leaching	804	2%	360	1%		
Other Methods	80	0%	10	0%		

2004 and 2009 data from IAEA; 2014 data from WNA

\* Open-Pit and Underground production grouped in source data

Eight of the nine largest mines in 2004 remained the same, most had significant production increases, and they accounted for about the same percentage of production despite the huge world increase. Canada, Australia, Kazakhstan, and Niger each had two of the world's giant uranium mines.

ten years. The vast majority of that increase was from new mines in Kazakhstan. With exception of the Athabasca Basin, Niger, Russia, and small high-grade mines in the Arizona Strip of the United States, underground mining has become largely uneconomic because of its high cost and the current low price of uranium.

The relative decline of open-pit mining can be attributed largely to much lower production from Ranger and Rossing, but that was offset somewhat by production from Langer Heinrich in Namibia. Co-product uranium comes mostly from the copper-gold-uranium operations at the unique Olympic Dam deposit in South Australia and is largely dependent on the price and demand for copper.

The major changes in mined sources of uranium and mining methods employed from 2004 to 2014 can be attributed to four factors:

- The ongoing worldwide nuclear build-out.
- Wild and unpredictable swings in the spot price.
- Financing difficulties for large capital expenditure underground projects.
- The phenomenal increase in low-cost ISR production from Kazakhstan.

Over the past ten years, annual world mine production has increased by over 16,000 tonnes, a gain of nearly 40%. All this growth and more has been attributable to Kazakhstan, which produced over 19,000 tonnes more in 2014 than in 2004. Besides having large sandstone uranium deposits ideally suited for in-situ mining, operations in that country have benefitted from a command economy, simple environmental regulations and permitting, the use of sulfuric acid as a lixiviant (a reagent that is banned for ISR in most other places) and a weak currency that was significantly devalued in 2015.

With 66 nuclear reactors under construction and another 158 in the planning stages across the world, the demand for uranium will

continue to grow. And with its low cost and environmentally-benign footprint, ISR mining will continue to gain in market share.

That said, Kazakhstan's production has leveled off for the past four years, and it is equivocal whether that country can continue to satisfy the world's growing demand for yellowcake.

And that folks, is one of the many reasons "Why I Remain a Uranium Bull".

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