

Permit pain threatens Canada's critical mineral push

Canada has great potential to supply critical metals to the US and Canada. Yet under the Impact Assessment Act (IAA) 2019, there doesn't seem to be any takers



Future Of Mining > Exploration

Comments

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"Accelerate project permit timelines while still ensuring Canada is meeting the highest environmental, social, and governance standards, including Indigenous consultation and partnership." Brendan Marshall Vice President, Economic and

Northern Affairs Clean Energy Canada, Turning Talk into Action: Building Canada's Battery Supply Chain

The new IAA changes the mine permit review process, but it is still unclear how it will affect our domestic mining industry. Canada at one point had a well-seasoned, and reasoned Canadian Environmental Assessment Act (CEAA). It was the envy of any nation on this planet, especially in comparison to Canada's southern neighbour, the US.

The CEAA 2012 law was solid. It was built on mine experiences of the 1960s to early 1980s, generational experience to draw upon that was refined to CEAA 2012.

CEAA 2012 was like a Leonardo Da Vinci painting but for mine assessment law. Spare and careful in strokes, almost perfect in detail and orderly thought. In contrast, there have been concerns about the newer IAA 2019, which was brought in by the Liberal government in August 2019.

Concerns raised by others with respect to the expansion of sociological studies such as GBA plus and more power assigned to the Minister of Natural Resources Canada (NR Can). There had been preliminary testing of GBA plus underneath the old CEAA 2012 process within the mining industry with mixed results that nobody from the mining industry appears to wish to share. Internet trips to the Auditor General department for Canada doesn't reveal any studies that are for or against GBA plus. That leaves the opinions of others.

The Canadian Mining Association of Canada, sums up their opinion:

MAC proposed to amend Bill C-69 to permit environmental assessments currently proceeding under CEAA 2012 to continue, rather than transfer the assessments to the IAA. MAC argued that transitioning projects proceeding under CEAA 2012 to the IAA would create uncertainty for project proponents, investors, and communities. MAC underscored the importance of this proposed amendment by highlighting the decline of appeal associated with Canada's investment market in recent years.

Canadian Mining Association

Let's leave IAA 2019 for the moment and look at something that represents one of the largest and most problematic issues which is the time it takes to explore for a new mine. It is certain to be a limitation on the green transition if a more odds approach is not taken. As mining is a rare event in terms of discovery of a mineable resource it presents us existing odds in Canada are not great to find a metal mine to feed into the Canadian permit review process.



Oh mineable minerals where art thou?

In Canada, to establish a mineral claim electronically is a trivial task. Most provinces will allow an electronic claim that takes only a few hours to establish over a property. Regulators review on claims can be a short process of the few hours to a few days to just a few weeks. The actual exploration process for permits such as road works, trenching and drilling can take anywhere from 3 months to more than a year to establish in greenfield situations if the situation isn't from use of a helicopter.

Then comes finding the mine. For an exploration geologist to discover a mine is a very long process. Years in fact. It is a long odds game, finding a mine in greenfield territory. Mine finding is a rare event: in a greenfield situation one can expect one to 10,000 odds of finding a mineable resource and metals according to PDAC. This well-known truism of metals exploration, this low odds figure of success in finding a mine, is based on the work of Donald Singer and Ryoichi Kouda back in 1998. They took a look at the most common deposit types and did odds-based calculation and reasoning on finding of these deposits. [i],[ii]

Using the same formula that these researchers came up with in their odds calculations, a calculation shows each mine at those PDAC odds takes 29,957 boreholes, to find a greenfield mine at 95% odds. About 9 years of exploration drilling, putting holes into geophysical anomalies. To get the equivalent of 95% odds to find a mine at 1 to 10,000 odds, one would need to drill 118 years' worth of total drilling time. This dramatic length of figure for drilling is cut by drilling boreholes in parallel but it does not eliminate the fact that it takes a long time, about nine years to deliver a mine using current industry practices. There would be something on the order of \$0.5 billion with the monies in drilling, using penny stock support for monies, to find a gold mine or critical metals mine. That is slim pickings finding mines under traditional exploration techniques.

However, even if you find a new mine, it does not mean that you can start mining right away. You must create a feasibility study (a 43101 report), drill enough to define the resource to bring it up to an acceptable level of risk, then one goes out and shops the mine to funders. Funding even early in the process will now involve involves environmental, social, and governance (ESG) assessments. That includes Indigenous consultation and partnership. All these are requirements of funders due to rapid expansion of funder ESG policies. If the Canadian government could only more clearly explain that their gender equality process to link that process more readily for funders requirements for ESG considerations for release of funds, perhaps the mining industry would have better buy-in on IAA 2019.

In fact, we might argue with no evidence to the contrary that Canada's mine permit process is still as dependable as a clock. But it more appears IAA 2019 is so poorly explained or justified by the present Trudeau Government that to use the old "I Love Lucy" line by Ricardo Montalban, who mutter in disbelief at Lucy's antics, in Spanglish: "You've got some 'splaining to do."

The IAA 2019 replaced the previous Canadian Environmental Assessment Act (CEAA) 2012. The main changes include:

- Expanding the scope of projects that require federal assessment
- Creating a new agency called the Impact Assessment Agency of Canada (IAAC) to oversee all federal assessments
- Introducing new factors to consider in the assessments, such as climate change, gender-based analysis, and cumulative effects
- Extending the timelines for assessments from 365 days to up to 600 days for standard projects and from 720 days to up to 900 days for complex projects
- Increasing public participation and transparency in the assessments
- Enhancing Indigenous engagement and partnership in the assessments

The IAA 2019 aims to improve the quality and credibility of the assessments and ensure that projects are aligned with Canada's environmental and social goals. However, it also creates more challenges and risks for the mining industry, such as:

- Increased costs and delays for project proponents
- Increased uncertainty and unpredictability for project outcomes
- Increased potential for litigation and opposition from stakeholders
- Increased duplication and inconsistency with provincial and territorial processes
- Decreased competitiveness and attractiveness for mining investment

The IAA 2019 has been criticised by many industry groups and experts as being too burdensome and restrictive for the mining sector. They argue that it will hamper Canada's ability to develop its mineral resources and contribute to the global demand for clean energy and technology.

We did a multi-decade analysis of the CEAA/IAA Registry (**See Figure 1**) and did a count on metal mines produced under different governments since 1997, and based on this graph, find ourselves in agreement of Brendan Marshall. Brendan Marshall is Principal Advisor External Affairs Canada at Rio Tinto, who just a few years prescient view is on the new IAA permit process was: "...there is an urgent need to adjust the IAA process to avoid developing the perception that Canada is an unpredictable and slow destination for mining investment. Once developed,



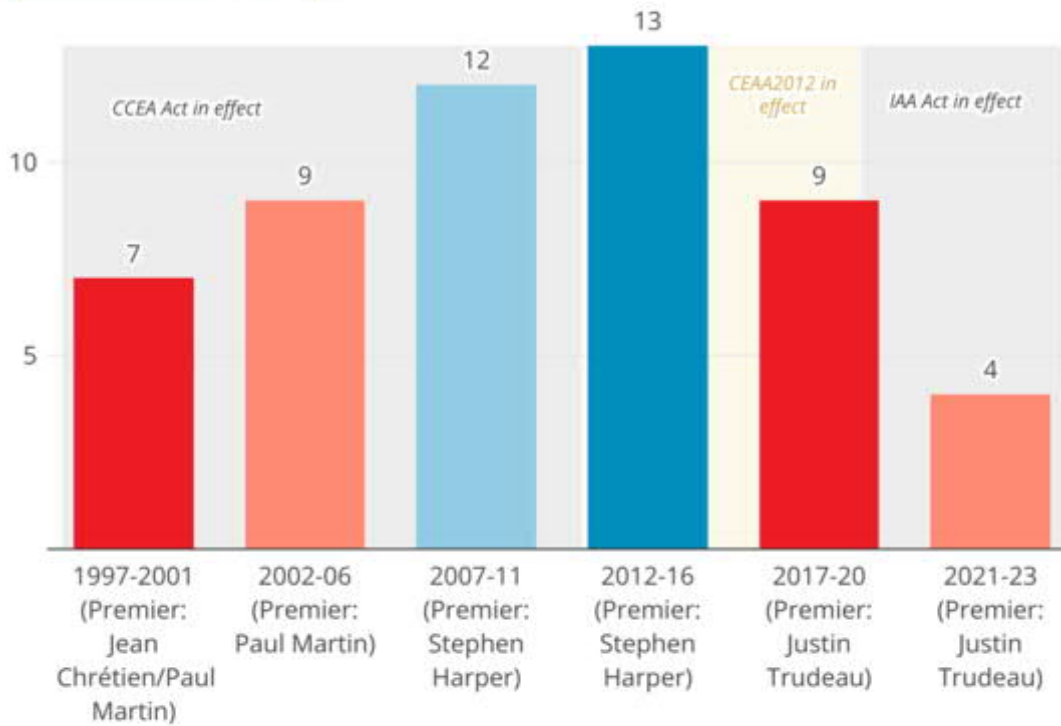
such a reputation is difficult to reverse, will undermine Canada's goal of enhancing critical mineral supply and will detract from the "Mines to Mobility" battery and EV supply chain policy objective."

Conservatives more friendly to metal mining projects

Number of new metal mining projects approved, by premiership, 1997 to 2023

Colour key: **Liberal majority** **Liberal minority** **Conservative minority**

Conservative majority



Source: Mining Magazine based on Canadian Impact Assessment Registry



Figure 1 Federal Liberal IAA Law Change Reduces Active Mines. Completed Reviews. Down -69.2 % Compared to Previous Conservative Government. Data source: CEA/IAA Registry.

The number of metal mines reviewed by the Trudeau government has dropped by 69.2% compared to the previous Harper government. This shows that Trudeau's government is scaring off mining investors in Canada. But it could also be because of other factors, such as:



- The lack of good mining sites near old mines in Canada
- The better odds of finding new mines in other countries

The longer and harder process of getting mining permits in Canada

As we have noted, Trudeau's government has a new law for mining, called the IAA 2019. But no new mines have been funded under this law. It seems that the mining industry and funders are avoiding this law. In a country that is suffuse in its bounty of economic minerals, no mines are currently being put through the system to get into production. This comes out in the numbers.

Trudeau's government has only approved one metal mine that was started by the Harper government under the old CEEA 2012 law. Three metal mines were rejected, and two are still in review after more than 8 years, again from the Federal government. There are no metal mines that were started by Trudeau's government under the new IAA 2019 law (**See Table 1**). In over eight long years the Trudeau government is scared away mine investments.

Metal Mine Projects Undergoing\Undergone Review CEEA to CEEA 2012, IAA 2019

	Total	Approved	Approval Rate
Metal mines under Harper (2006-2015), Completed	23	6	26%
Metal mines under Trudeau (2015-2019), Completed (CEEA 2019)	3	1	33%
Metal mines under Trudeau (2019-2023) in progress reviews, IAA 2019 Era, but under CEEA2012 reviews	2	0	0%

Source: CEEA/IAA Online Registry



Figure 2 No Funds or Banks have Funded New Metal Mines since IAA 2019 was Enacted

The Honourable Jonathan Wilkinson, Minister of Energy and Natural Resources, with some older experience in sales, and none in mining, can't seem to sell the Canadian mine investment. While we could poke holes at the man for his trying, there are other factors at play.



One reason is Covid-19, which has made money and houses more expensive in Canada and the US. This has also made banks change their bonds from long-term to short-term. This means banks have less money to invest in mines, which take 7 to 10 years to make money. Also, mines cost more to build because of inflation.

Another reason is the competition from other countries that have faster and better processes for mining. For example, the US has the FAST-41 process, which can make the environmental review take only 2.5 years. The US also has joint reviews by the state and federal governments for metal mines, which can make the process smoother and faster. One only needs to look at permit processes and time for mines is a type of worldwide competitive figure to start to understand the answer. Let's start with the Canadian process what it looks like from a numbers point of view.

Overall, what does the Canadian process look like with respect to overall bulk average environmental to permit stage and then construction of a mine?

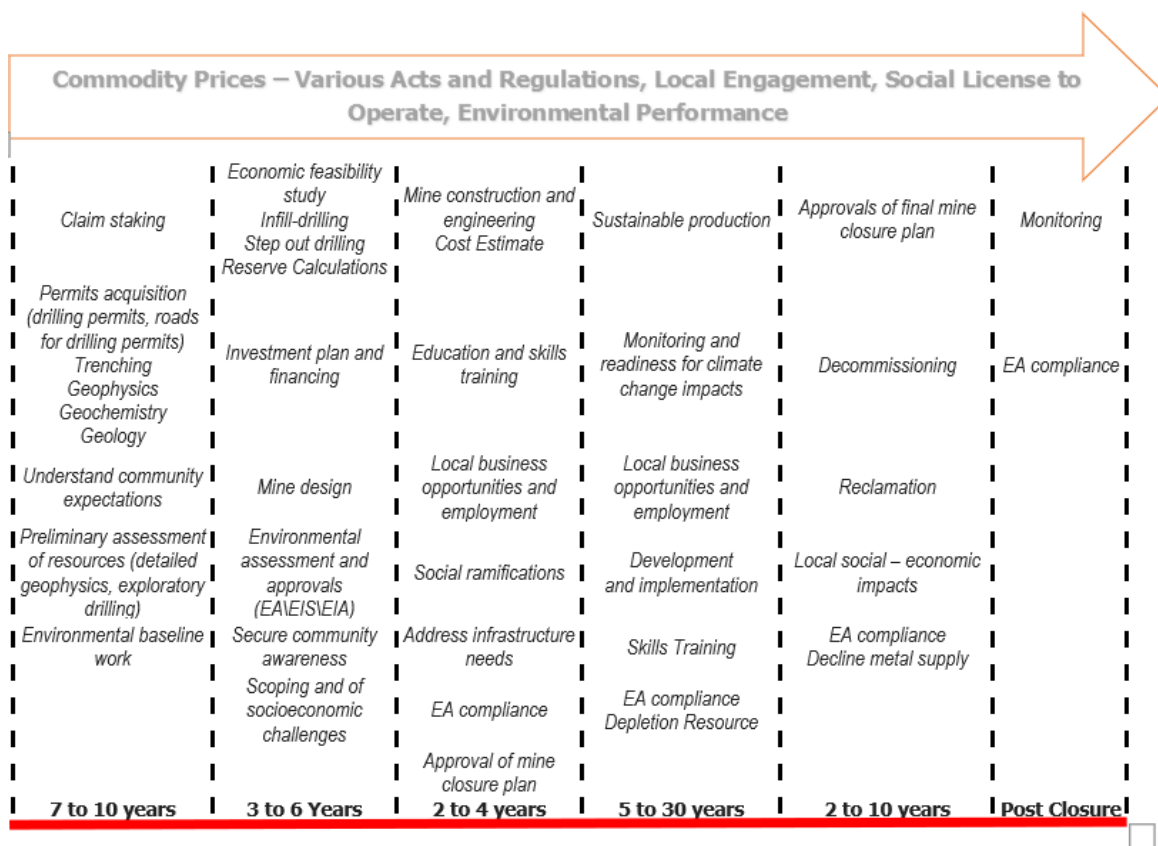


Figure 3 Infographic on Canadian Mine Development Sequence. Modified From *Visualizing the Life Cycle of a Mineral Discovery* & Natural Resources Canada Page 9 *Natural Resources Canada Global economic trends influence Canada's minerals industry, infographic "Mineral Development Continuum"*



Much as our brief odds calculation previous (nine years), the government of Canada accords 7 to 10 years to find a mine from exploration **Figure 3**. That isn't unusual from an international perspective as well: overseas mines take this long to find as well.

Shifting our focus from the point at which major investors have funded the mine, the next phase involves further steps such as step-out and infill drilling. The mining company gathers together some environmental impact assessment (EIA) consultants and a start on the EIA process to gather the environmental and sociological conditions necessary for the background of the mine build.

Just over two years appears to be the most common metal environmental impact assessment mine review times expected for metal mines here in Canada. This means that under the new IAA 2019 process, which we think will be 24 months in duration. Once one includes printing time for these huge EIA studies (137 days for draft, 137 days for final environmental impact assessment print out), we are looking 2.5 to 2.75 years on an environmental impact assessment, which is now within the theoretical range of what FAST-41 can potentially do in the US (*2.5 years theoretical potential as shown in our last article on the US Mine EIS process*), making the US and Canadian processes for EIA almost identical in time potentially if a mine in the US is done under FAST-41.

When we compare this figure to the IEA figure for feasibility period end to actual mine construction, we see that worldwide benchmark figure of 4.4 years in total worldwide for the same process. The following table breaks the Canadian mine permit process into these major steps leading up to a mine (**See Table 1**).

Table 1: Exploration Definition drilling, EIA, Construction, Operational Permits			
Permit	Requirement	Typical Time	Years
Exploration Permit	MLA exploration permit. 30 to 50 days. Required for certain early exploration activities, such as line cutting, mechanized stripping, bedrock excavation, and drilling	<u>40 days</u>	0.11
Environmental Assessment (EA)	Required for projects that may have significant adverse environmental effects, such as new mines, major expansions, or closure plans	<u>About 2 years</u>	2.00



Closure Plan Approval	Required for advanced exploration or mine production activities that involve site rehabilitation after mining, varies with province	<u>90 days for new closure plan submission, MERN in Quebec</u>	0.25
Water Taking Permit	Immediate, 90 days and up to a year in some cases.	Immediate for some activities, About 90 days from submission	0.25
Fisheries Act Authorization	60, 90 and 120 permit processing times. Required for projects that may result in serious harm to fish or fish habitat, such as altering watercourses or affecting water quality	Category 2: <u>About 90 days from submission</u>	0.25
Species at Risk Permit	Required for projects that may affect endangered or threatened species or their habitat, such as clearing vegetation or disturbing wildlife	<u>About 60 days from submission</u>	0.16
		Years =	3.0
	Mine construction (boxed mine, 2 Years)		5.0
	Mine construction (stick built, 4 Years)		7.0

With a stick-built mine you might as well add four years to the process of putting a mine in place. A more intelligent approach is to use a modular mine system which can deliver a mine in roughly two years. Modular mine system is more appropriate for Canadian winter seasons as you can do the majority of your work on the mods in the summer season and have most of the modular build units done elsewhere on far cheaper factory sites. If we take a more common situation like a mine in Ontario the sequence pretty much follows what is seen below (**See Fig.4**). The major components of an exploration, construction to closure permitting information can be found online for Ontario, as an example.



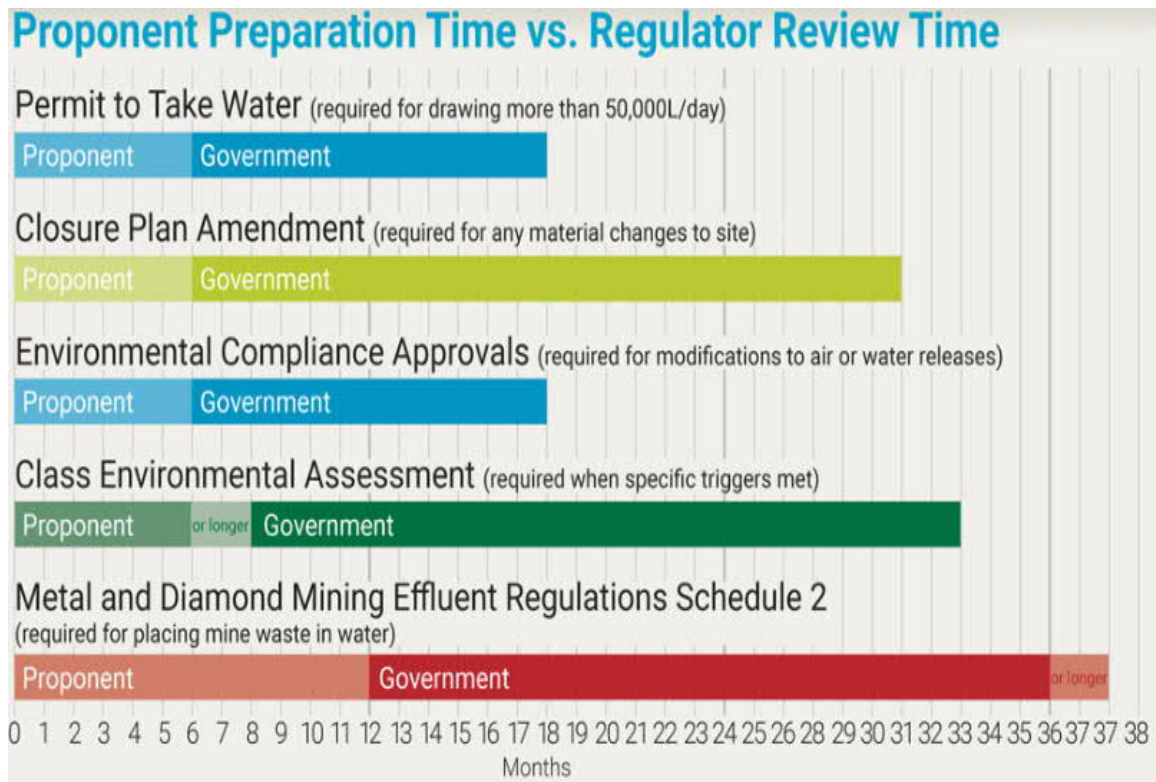


Figure 4 Mine Permit Process (Proponent Time Spent and Government Time Spent on Permit Applications) in Ontario. Source: [Ontario Mining Association](#)

For those provinces, such as BC, the information is spread out across several different areas, but one can make a [start on the process of gathering this information here](#). The far North in Canada, in places such as the NWT, and Nunavut, that is a specialized permit environment which we require an approach is seen at the following link on [exploration permit to mine permitting process shows for Nunavut](#).

According to Natural Resources Canada, it takes 5 to 10 years to develop a mine in Ontario (**See Fig. 3**). Using a modular built mine construction approach, an average gold mine in Ontario is economic if it starts production within 8 years. In our previous article, we showed that an average open pit gold mine would lose money if it delayed production by 8 years after the feasibility study due to the slow environmental impact assessment process (EIA) and issue of permits on a mine.

However, the worldwide average time from feasibility to production is only 4.4 years, according to the IEA (**See Fig. 5**). This means that Canadian mines EIA and permit creation cycle is less time efficient are less time efficient than international figures for the same. To match the global average, Canadian mines need to improve their permit process and environmental impact assessment *by at least half a year on the low end and by almost six years on the high end. Otherwise, they risk losing their economic viability.*



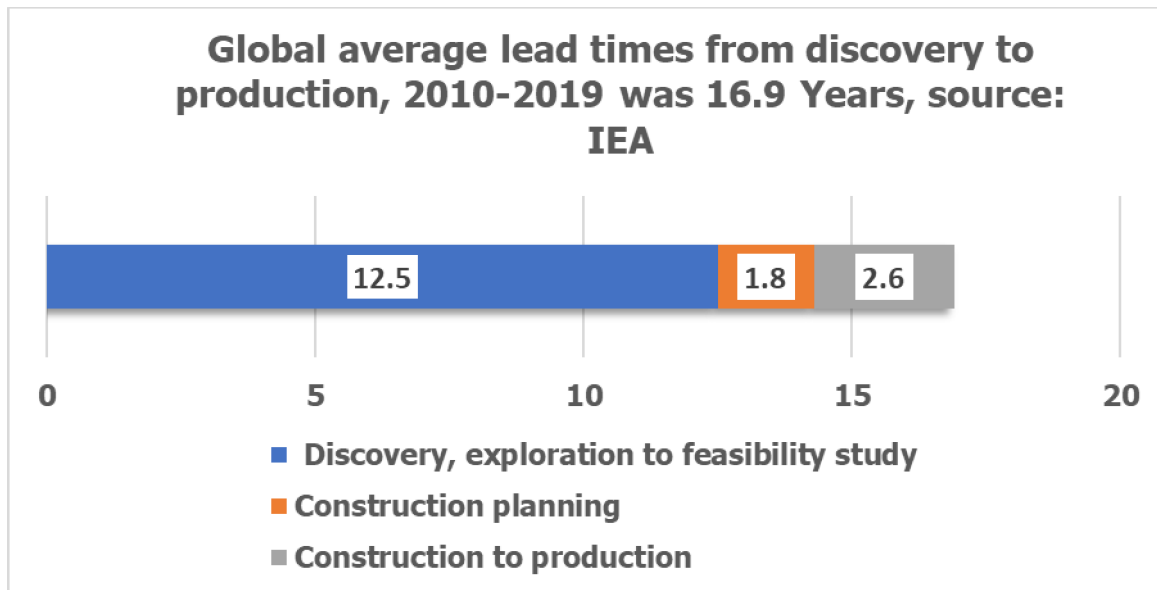


Figure 5 Long Mining Process, Mining permit process worldwide (construction planning) is 1.8 years worldwide, when combined with 2.6 years for construction, 4.4 Years from Construction planning to production across the world. Data source IEA.

If the author's compilation of the high-end of 7 years (**Table 7**) is used for permit processing within the Canadian environment in Ontario, the Ontario mine permit environmental impact assessment to permit issuance for mine construction and construction a mine would have to improve by 2.6 years (two years and six months) is a comparison to the IEA of 4.4 years that is worldwide.

It is a clear indication that the Canadian mining permit process when one includes the environmental impact assessment process to mine permit and then construction process is not competitive right now with worldwide figures. *The likeliest reason why current Canadian mines are not being invested in is because investors are going elsewhere with shorter and more efficient permit processing times. The very public IEA figure of 4.4 years of time needed elsewhere to get a mine up from a feasibility study to full production is the comparable to beat for Canada.*

Conclusion

Canada has fallen into a downward path with respect to new mines entering its mine permit system. This can be seen in the numbers. It is clear from worldwide figures, that internationally, other countries see the IEA figures of 4.4 years as a benchmark to getting a mine up and running from feasibility studies to production mine in 4.4 years. For Canada to compete it needs to shift the Canadian figure of 5 to 4 years towards a more efficient regulatory review process that will bring a mine quicker up to full metal production (EIA, all mine permits to construction and

production). At the very least Canada has to meet or improve upon that 4.4-year from feasibility to production of a mine for metals figure which the IEA has released to the general public of the world.

[i] Authors figure, For a 95% chance of success, we have $n = \log(1 - 0.95) / \log(1 - 0.0001) \approx 29957$. So, about 29957 boreholes are needed to have a 95% chance of finding a metal deposit in a greenfield situation.

[ii] Donald Singer and Ryoichi Kouda, "**Natural Resources Research**," Vol. 8, No. 2, US geological survey and Japanese geological survey, 1999, Found at: https://www.researchgate.net/profile/Donald-Singer-4/publication/346816106_Exploration_Risk/links/61c01548a6251b553acea278/Exploration-Risk.pdf



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