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**Subject:** Silica Sand Extraction Project  
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Submitted to the Clean Environment Commission:

Dear Commissioners,

I enjoyed a recent radio podcast from CBC, *The Cost of Living* hosted by Paul Haavardsrud. It aired on March 19, 2023 and the episode was *The New Gold Rush*. It talked about the current mining boom and started the episode at a major mining convention hosted by the Prospectors and Developers Association of Canada (PDAC), held in Toronto from March 5 - 8, 2023. From its website "*PDAC 2023 The World's Premier Mineral Exploration & Mining Convention is the leading event for people, companies and organizations connected to mineral exploration. This annual convention in Toronto, Canada is known for attracting up to 30,000 attendees from over 130+ countries for its educational programming, networking events, outstanding business opportunities and fun.*"

The podcast talked about the tremendous global growth for a wide range of minerals necessary for electronics and batteries, estimated to quadruple in demand over the next decade. The high-rollers are lithium, battery grade nickel, cobalt and graphite. Canada is generally behind in supply but has the resources and is gearing up to provide these and others: a long list of a couple of dozen minerals-in-demand, including silica sand.

As the podcast journalist described the scene at the convention I could see Feisal Somji strolling the rows of booths and in the halls and conference rooms, feeling the buzz and power of the industry and perhaps looking for a new investor for the Vivian Silica Project. Maybe he did attend and this is where he met German interests in solar panel manufacturing. The potential of having a local end-user for silica sand was too big a story not to promote. But let's see what happens on that front - sounds like timing is an issue here.

This is the world in which Sio Silica is playing. It's about money and growth and potential and development and people and caring. But it's about money first.

The podcast noted that Canada is slow in approving mining projects, particularly due to the increasingly necessary environmental reviews at federal and provincial levels and dealing with the many justifiable indigenous concerns. Ten to fifteen years from application to approval for a major mining project is not unusual. I heard that the mining industry is deeply concerned about how Canada will fall behind in competing for this demand. And investors will go to other countries to meet their needs for these vital minerals. And I believe this may be a good thing in some cases. Like what should happen with Sio Silica's Vivian project.

Generally, growth and advancement in technology is good. I am an avid consumer of the latest technologies and recognize the need to develop alternatives to the use of hydrocarbons. But this project has a fatal flaw with its untested mining method, claiming it may have less environmental impact than conventional silica mining techniques. Thousands of drilling sites over hundreds of hectares, passing through an upper soil layer, a limestone aquifer, a shale layer and into the sandstone aquifer to pump out the sand. I don't see any scenarios and assessment of what could happen to these different layers over a 24 year timeline of sand removal. How can the integrity of the aquifer be simply ignored with this constant physical invasion?

I'll pause a moment to try and understand the scope of this untested, untried technology. The proposal is to remove, process and ship 1.36 million metric tonnes (MMT) of sand per year over a project life span of 24 years. At 110 tonnes per railcar, that is 12,363 railcars of sand removal per year. That's almost two unit trains (150 railcars each) per week. To understand the volume let's use the olympic swimming pool analogy. An olympic swimming pool is 50 meters long by 25 metres wide by 2 metres deep. That's 2500 cubic metres of water. If loosely packed sand has a specific gravity of about 1.36, then you would need  $2500 \times 1.36 = 3400$  tonnes of sand to fill the pool. In a year that would be 400 olympic swimming pools of sand removed with no understanding of the dynamics happening below our feet. Will the land absorb the impact or will there be dangerous side effects?

Back to the economics of the project. The silica sand market size was valued at 12.6 billion US dollar in 2021 (see below). Production is dominated by the United States with over 42% of the market, much of which is increasingly focused on high quality silica for advanced technologies like solar panels to computer chips that require extremely high silicon purity. The commodity value of silica sand is around USD\$52 per tonne (CAD\$71) making the projected production from Vivian a paltry 0.5% market share, hardly able to make a ripple in market impact, nor to fight off deep pockets that could shut markets off or entice them away.

Apparently the sand near Vivian is high quality silica (silicon dioxide at >99.9% purity). But it would still require high energy requirements (electricity and natural gas) and sophisticated processing technology to make the type of glass needed for future, high value applications. *Silicon for solar panels has to be 99.999999 percent pure—six 9s after the decimal. Computer chips are even more demanding. Their silicon needs to be 99.9999999999 percent pure—eleven 9s. “We are talking of one lonely atom of something that is not silicon among billions of silicon companions,” writes geologist Michael Welland in Sand The Never-Ending Story. (See the WIRED article below)*

Very little of this high-tech processing and production is done in Canada, although the CPS/Wanipigow Sand Project purports to be the first in Canada to turn Manitoba sand into solar panels. Most of the demand for high quality silica is now in the Asia Pacific region. Moving a commodity from the centre of Canada by rail to port and port to destination in Asia must compete with numerous other products such as grain and fertilizer to coal and iron and many many others. Transport costs will be crippling. Plan B is to sell into the North American hydrocarbon fracking market at lower values with even more serious environmental implications.

The project has significant environmental implications and concerns. The product has no local end use and competes as a non-distinguishable commodity in a fierce global environment.

It is not viable.

This project should not be supported by the Clean Environment Commission.

Thank you for considering these thoughts,

Sincerely,

Graham C. Worden

**Cost of Living**

<https://www.cbc.ca/listen/live-radio/1-379/clip/15973039>

**PDAC website**

<https://www.pdac.ca/home>

[The Ultra-Pure, Super-Secret Sand That Makes Your Phone Possible | WIRED](#)

[Silica Sand Market Size, Share, Growth | Report, 2030](#)