

THE MISSING LINK

Manitoba's Silica Strategy Deserves a Broader Discussion

A Manitoba Silica, Water & Value-Added Development Policy Discussion Paper



100,000 PEOPLE / 0.35 PERCENTAGE POINTS

One question Manitoba should answer before accepting additional groundwater risk.

Protect the Water • Quantify the Difference • Compare the Alternatives • Capture Manitoba's Value

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Working manuscript — evidence reviewed through September 13, 2026. Public-source links are provided in the Verification Record. The analysis, interpretations and conclusions expressed in this manuscript represent the author's opinion based on the evidence identified to date. Factual corrections, technical evidence and documented counter-evidence are welcomed and may be considered in any potential future revisions.

A Note to the Reader

THE PURPOSE

This paper does not ask Manitoba to reach a predetermined decision on the current SiMBA application. It asks Manitoba to widen the examination: protect an important drinking-water resource, quantify the economic and industrial significance of the apparent purity difference, compare alternative Manitoba development pathways, determine what enforceable protections government is prepared to require, and examine how more of the downstream value can remain in Manitoba.

It began as a Springfield groundwater question. It became an inquiry into whether Manitoba is making individual project decisions without first establishing the larger industrial strategy those projects are meant to serve.

The central discipline of this paper is simple: no claim should be stronger than the evidence supporting it. Company statements are identified as company statements. Calculations show their inputs. Inferences are labelled. Questions remain questions.

SCRUTINY WELCOMED

Government officials, proponents, engineers, hydrogeologists, scientists, economists, Indigenous partners, elected representatives and residents are invited to challenge the facts, calculations, assumptions and propositions in this paper. Where superior evidence identifies an error, it should be corrected. Where an important consideration has been missed, it should be added. The objective is not to protect a conclusion. It is to identify The Missing Link.

What This Paper Does Not Claim

- It does not claim that the current SiMBA proposal will contaminate groundwater.
- It does not claim that SiMBA and Canadian Premium Sand (CPS) feedstocks are technically interchangeable.
- It does not claim that gross SiO₂ percentage alone determines industrial value.
- It does not claim that CPS is necessarily the superior development pathway.
- It does not substitute the author's judgment for Manitoba's environmental regulators, engineers or scientists.
- It does not treat the rejected 2024 Vivian proposal as identical to the revised current SiMBA proposal.
- It does ask whether Manitoba has examined the larger alternatives, risks, public protections and downstream opportunities as one connected strategy.

1. How a Question Became an Inquiry

This inquiry did not begin with a predetermined conclusion about Manitoba's silica development. It began with something I read.

In June 2026, I read public comments from Independent Dawson Trail MLA Bob Lagassé questioning Prime Minister Mark Carney's public support for Sio Silica while Manitoba's environmental review remained underway. Those comments caught my attention because Springfield's groundwater is not an abstract policy issue to me. I am a long-time resident of the RM of Springfield.

I was grateful that Mr. Lagassé had raised the issue publicly. It caused me to look more closely — and then to ask a somewhat different question: if Manitoba sees a strategic opportunity in silica, solar technology, advanced materials and downstream manufacturing, are we looking broadly enough at the development pathway?

On June 20, 2026, I sent Mr. Lagassé correspondence entitled "The Missing Question in Manitoba's Silica Debate: A Question of Responsible Development," under the email subject "Manitoba's Silica Strategy Deserves a Broader Discussion." I copied the correspondence to Premier Wab Kinew, Deputy Minister Daniel Blaikie, and media recipients because I believed the larger question warranted public-policy consideration.

The original correspondence explicitly asked why so much attention was being directed toward Sio when Manitoba also possessed an alternative silica-development pathway through Canadian Premium Sand. It argued that the largest economic value is created downstream — through processing, reduction, manufacturing and product development — and asked Manitoba to examine the entire chain rather than one extraction project in isolation.

THE FIRST TURNING POINT

On July 27, 2026, Mr. Lagasse's constituency office replied that the email had "raised several important points," had been valuable in helping the office understand concerns, and had "contributed to our ongoing review of this issue." The office later invited further discussion after reviewing Manitoba Environment's response. That engagement encouraged the inquiry to continue — but this report remains independent research and should not be interpreted as Mr. Lagasse's endorsement.

One question led to another: groundwater led to purity; purity led to beneficiation; beneficiation led to alternative resources; alternative resources led to transportation, Selkirk, energy, Indigenous participation, international partnerships, manufacturing and trade.

The missing question had become a search for The Missing Link.

A continuing discussion

I have welcomed the opportunity to sit down with Mr. Lagassé and continue the discussion. This manuscript was developed in anticipation of that opportunity and for subsequent public-policy discussion. Mr. Lagassé did not commission it. The purpose of acknowledging the chronology is to show how the inquiry developed, not to borrow his authority for its conclusions.

2. 100,000 / 0.35 — The Question That Demands an Answer

100,000 / 0.35

On February 16, 2024, when Manitoba refused an Environment Act licence for the earlier Vivian sand extraction proposal, the province stated that the Clean Environment Commission had identified serious environmental concerns about a project that would have extracted sand through aquifers providing drinking water to approximately 100,000 Manitobans. That statement concerned the earlier proposal, not an automatic finding about the redesigned 2025–26 SiMBA application.

The current SiMBA Environment Act Proposal reports that the raw quartz sand resource averages approximately 99.85% SiO₂. Manitoba regulatory material for the CPS Wanipigow project states that produced wet sand was calculated at approximately 99.5% silica.

THE ARITHMETIC

99.85% – 99.50% = 0.35 percentage points.

If — and only if — the published figures are sufficiently comparable for a gross assay comparison, that difference is equivalent to about 3.5 kg of additional non-SiO₂ material per tonne of feedstock. It is arithmetic, not an economic valuation.

That is where the real question begins. Gross silica percentage does not establish technical equivalence. Individual impurities, mineralogy, particle size, beneficiation requirements, customer specifications, furnace performance, yield, energy consumption, residue generation and downstream purification may matter more than the gross number.

99.85% pure is a chemical assay, not an economic valuation.

The responsible question is therefore not whether 0.35 matters. It is what that apparent 0.35-percentage-point difference is actually worth — technically, environmentally and economically — and whether government has independently quantified it before weighing development pathways that interact with different environmental systems.

The 0.35 test

1. Identify the actual impurity profiles, not merely gross SiO₂ percentages.
2. Determine whether the SiMBA and CPS figures represent technically comparable material and testing methods.
3. Determine the downstream specifications required by proposed manufacturers and technology partners.
4. Quantify beneficiation required for each feedstock and its capital, operating, energy, water and waste implications.
5. Quantify effects on silicon/glass yield, furnace performance, purification requirements and product value.

6. Translate the difference into a defensible economic value per ton for the intended end uses.
7. Then compare that value against the environmental, infrastructure and public-risk profile of each pathway.

COMMON-SENSE QUESTION

Before Manitoba accepts additional interaction with an important potable groundwater resource, should government independently establish what the apparent 0.35-percentage-point purity difference is actually worth — and whether comparable economic objectives can be achieved through another development pathway?

KEY FACTORS FOR A MEANINGFUL COMPARISON

AREA	QUESTION TO ADDRESS
Product Value	How does the apparent 0.35-percentage-point purity difference translate into real technical and economic value for the intended end products?
Technology	What processing, beneficiation or upgrading would be required for each feedstock?
Economics	What is the capital, operating, energy and other costs associated with each pathway?
Environment	What are the water requirements, groundwater risks and mitigation implications of each pathway?
Infrastructure	What transportation, power, processing and other infrastructure would each pathway require?
Manitoba Benefit	How much employment, ownership, taxation, processing and manufacturing value would remain in Manitoba?
Risk & Certainty	What are the technical, environmental, regulatory, market and implementation risks of each pathway?

3. The Current SiMBA Proposal — Keep the Record Straight

Precision matters. Manitoba rejected Sio's earlier Vivian sand extraction proposal in February 2024. The current application is a revised project under Environment Registry File 6275.00. The two records must not be blurred.

According to the current Environment Act Proposal, Sio proposes an initial five-year, stepwise phased project southwest of Vivian. Water-well drilling rigs would install extraction wells to the Winnipeg Sandstone formation at roughly 61 meters (200 feet) below ground. Compressed air would bring sand to surface with groundwater. Water would be separated from the sand, filtered and UV treated before being returned down the wells; separated sand would move to a previously licensed processing facility through a slurry loop.

The current public registry includes the proposal, hydrogeological assessment, geotechnical analysis, draft closure plan, public submissions, Technical Advisory Committee comments and a March 10, 2026 request for additional information. As of the research cutoff used for this manuscript, the registry page identifies April 17, 2026 as its latest posted information.

FAIRNESS TO THE PROPONENT

Sio states that the revised project responds to concerns raised during the earlier review by substantially reducing initial extraction volumes, using a phased approach, and monitoring groundwater quality and quantity for changes not predicted by its assessment. Those are material changes and claims that must be assessed on their own evidence.

The fact that the proposal is revised does not eliminate the public's right to ask whether the revised approach provides adequate protection. Nor does the earlier refusal predetermine the present application. The current record must be examined on its own merits.

The regulatory question is narrower than the strategic question

The environmental assessment asks whether the proposed development can meet Manitoba's legal and environmental requirements, with appropriate mitigation and licence conditions if approved. The strategic question in this paper is broader: even if a project can be licensed, how does it compare with alternative pathways for achieving Manitoba's economic objectives?

THREE QUESTIONS — DO NOT CONFUSE THEM

1. REGULATORY: Can the current SiMBA project be licensed with acceptable environmental protection?
2. ECONOMIC: Which silica-development pathway creates the strongest net benefit for Manitoba?
3. STRATEGIC: What silica-to-manufacturing industrial chain does Manitoba want to build over the next 25–50 years?

A "yes" to one question does not automatically answer the others.

4. What Is Manitoba Prepared to Guarantee?

Residents should not be required to base confidence in the protection of their drinking-water resource solely upon assurances that a proponent, consultant, elected official or supporter will exercise best efforts. Those assurances may be sincere. They are nevertheless different from measurable, enforceable and financially backed protections imposed by the province.

Absolute scientific certainty may be impossible. Public accountability should not be.

Manitoba states that Environment Act licences are site-specific and may contain requirements covering pre-construction, construction, operation, monitoring, reporting, decommissioning and financial assurance. The current SiMBA proposal also contains an Environmental Emergency Response Contingency Plan. The important public question is therefore not simply whether mitigation is discussed, but what protections would become enforceable if a licence were issued.

BASELINE WATER	Sufficient pre-operation quantity/quality data to distinguish natural variability from project-related change.	Requires detailed review	Without a defensible baseline, causation can become difficult to establish.
TRIGGER THRESHOLDS	Measurable conditions that require investigation, mitigation, suspension or shutdown.	Requires licence-level review	A monitoring program is stronger when consequences are defined in advance.
INDEPENDENT VERIFICATION	Who samples, audits and validates data; public access to results.	Requires detailed review	Trust improves when verification does not depend solely on the proponent.

REPLACEMENT WATER	Immediate response if a household/community supply is adversely affected.	Unresolved in this manuscript	Residents need to know what happens on day one of an incident.
FINANCIAL ASSURANCE	Bond, security, insurance or other financial backing sufficient for foreseeable obligations.	Potential provincial tool; project-specific amount unresolved	Liability is meaningful only if resources exist to meet it.
LONG-TERM LIABILITY	Responsibility after closure and in the event of insolvency or corporate restructuring.	Requires legal/regulatory review	Environmental effects can outlast the operating company.

THE GOVERNMENT QUESTION

If Manitoba determines that this development can proceed safely, what measurable, enforceable and financially backed protections is Manitoba prepared to require for Springfield residents whose drinking-water resource could be affected?

If government cannot promise zero risk — a standard few industrial activities could honestly meet — then government should quantify the residual risk, identify who carries it, explain why the public benefit justifies it, and demonstrate why an alternative pathway with a different risk profile is not preferable.

5. Canadian Premium Sand — Comparator, Not Chosen Champion

Canadian Premium Sand matters to this inquiry because it demonstrates that Manitoba's silica opportunity is not confined to one resource or one extraction method. CPS holds Manitoba Environment Act Licence No. 3285 R for its Wanipigow project and Licence No. 3401 for a Selkirk solar-glass manufacturing facility.

Manitoba's Wanipigow regulatory record states that extracted sand was calculated at 96.3% silica and produced wet sand at 99.5% silica. CPS's own technical work describes beneficiation routes and a low-iron resource intended for glass and other industrial markets.

CPS's April 16, 2026 strategic review states that the company has a 42.3-million-tonne measured and indicated silica resource, with a 24.4-million-tonne inferred low-iron subset suitable for solar and other glass products. The review explicitly contemplates partnerships, joint ventures, strategic alliances, financing, asset transactions or continuation of a standalone plan.

IMPORTANT LIMITATION

The existence of CPS does not prove that CPS can satisfy the same technical specifications, customer requirements, economics or volumes as SiMBA. That is precisely why an independent comparative analysis is needed.

The comparator test

- What products can each resource make after realistic beneficiation?
- What impurities drive the difference in value?
- What are the capital and operating costs to reach each target specification?
- What environmental impacts arise from each extraction and beneficiation route?
- What infrastructure is required?
- What Indigenous ownership/participation structures are available?
- What downstream manufacturing is committed to Manitoba rather than merely contemplated?
- What public incentives, infrastructure or energy capacity would each pathway require?
- How much economic value remains in Manitoba?

Not "CPS is better." Show Manitobans that the alternatives were actually compared.

6. International Partnerships — Are They Resource-Specific?

The June 2026 announcements surrounding Sio are significant. The Government of Canada stated that RCT Solutions would partner with Sio and other partners to support a high-purity silica project and a fully integrated solar manufacturing hub in Manitoba. Sio also announced MOUs with RCT Solutions and NanoXSolar for potential offtake and described collaboration with RCT Solutions and Indigenous partners.

Those relationships are a legitimate strength in Sio's case. This paper does not minimize them.

THE MISSING-LINK QUESTION

Are the international technology, manufacturing and investment relationships presently associated with SiMBA dependent upon SiMBA's particular resource — or could comparable partnerships be developed around another Manitoba silica resource after appropriate beneficiation?

If the answer is no, identify the technical or economic constraint.

If the answer is yes, Manitoba should understand the alternative before treating downstream opportunity as inseparable from one extraction pathway.

This is not a claim that RCT Solutions, NanoXSolar or any other partner would work with CPS. It is a question for government, industry and the partners themselves. Customer qualification and feedstock specification can be decisive.

Indigenous participation should be treated as a design principle

Manitoba is already using Indigenous-majority ownership structures in its energy strategy, including up to 600 MW of new wind generation supported by the Manitoba Indigenous Loan Guarantee Program. That does not automatically transfer to silica, but it demonstrates that government can design economic-development frameworks around Indigenous equity rather than limiting participation to consultation or contracting.

A broader silica strategy should therefore ask not merely whether Indigenous communities participate, but where ownership, governance, long-term revenue and decision-making can sit within the value chain.

7. From Sand to Silicon — Where the Value Is Created

Raw silica is not semiconductor-grade silicon. A high SiO₂ assay is an input characteristic, not a finished technology product.

Silica / Quartz	Beneficiation	Silicon Metal	Purification	Wafers / Glass / Materials	Finished Manufacturing
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THE CRITICAL CONVERSION STEP

Silica does not become silicon simply because it is exceptionally pure. For silicon applications, quartz/silica feedstock is typically converted to metallurgical-grade silicon through carbothermic reduction in a submerged electric-arc furnace, where silica reacts with carbonaceous reducing materials at very high temperatures. Higher-purity silicon products then require additional purification and processing.

That is why the policy question should focus on the entire value chain. Manitoba’s own Economic Development Strategy identifies semiconductor fabrication as an emerging advanced-manufacturing opportunity and notes Manitoba’s base materials including silicon, gallium and germanium.

THE STRATEGIC QUESTION

Why are we debating which hole to dig when Manitoba should also be deciding which industrial chain to build?

The near-term opportunity may be glass, specialty silica, silicon or other advanced materials rather than a leading-edge semiconductor fab. The report should distinguish commercially plausible near-term steps from generational ambitions. Vision is useful only when the intermediate steps are credible.

8. Energy — Manitoba's Advantage Is Real, but Not Unlimited

Manitoba's electricity system is a major strategic asset. Manitoba Hydro states that up to 97% of the electricity it produces comes from water. At the same time, Manitoba Hydro's 2025 Integrated Resource Plan warns that demand is growing and supply is limited.

The 2025 IRP recommends continuing procurement of up to 600 MW of Indigenous-majority-owned wind and beginning implementation of approximately 750 MW of natural-gas combustion turbines for dispatchable capacity, alongside generating-asset enhancements and efficiency.

THE ENERGY QUESTION

If Manitoba is developing substantial new generation and grid capacity anyway, should part of that planning be coordinated with industries that convert Manitoba resources into higher-value products here — rather than treating electricity, mining and manufacturing as separate policy files?

Energy-intensive industrial development must be evaluated against reliability, rates, drought exposure, transmission requirements and competing demand. Manitoba's hydro advantage is valuable precisely because it is not infinite.

9. Selkirk — An Existing Value-Added Node

CPS's licensed Selkirk solar-glass facility is important because it provides a concrete example of a Manitoba resource being linked to Manitoba manufacturing. Manitoba's Registry File 6137 records Environment Act Licence No. 3401 for the facility. CPS describes the site as adjacent to highways, railway and power systems and has projected approximately 270 permanent employees for its first phase.

The project's current commercial status must be stated carefully. CPS reported in December 2025 that it had paused further development of its patterned solar-glass projects amid trade-policy and geopolitical uncertainty while pursuing near-term quarry opportunities. Its April 2026 strategic review reopened a wide range of possible paths.

WHAT SELKIRK PROVES — AND DOES NOT PROVE

It proves that a value-added silica manufacturing concept has advanced far enough to obtain a Manitoba environmental licence.

It does not prove that the plant will be financed, built, commercially successful, or suitable as the center of a broader silicon industry.

Those are investment and industrial-strategy questions still to be answered.

A serious Manitoba strategy should test whether Selkirk's industrial land, workforce, road/rail access, power infrastructure and existing industrial base make it a logical node for additional processing — while also evaluating cumulative air emissions, traffic, energy demand and community impacts.

10. Transportation — Do Not Confuse an Idea with an Engineering Conclusion

Transportation can determine whether an otherwise attractive resource is economically viable. This paper therefore treats logistics as a major research question, not a footnote.

CPS's present Wanipigow concept uses trucking. Historical CPS engineering examined other bulk-logistics concepts, including conveyor and Lake Winnipeg barge movement. The fact that a concept was engineered historically does not establish that it is economical or environmentally preferable today.

THE THINKING DISCIPLINE

A transportation concept belongs in the “Think Tank” until modern engineering establishes annual throughput, seasonal reliability, loading/unloading infrastructure, capital cost, operating cost, emissions, dredging/navigation requirements, winter logistics, stockpile requirements and community impacts.

The useful question is annual throughput, not whether freight must move every day of the year. Seasonal transportation can sometimes be paired with stockpiles so a manufacturing plant operates continuously while freight modes change or pause. Whether that works here must be engineered.

The lake can stop moving freight without the factory necessarily stopping production — if the inventory system is designed for it.

That sentence is a logistics proposition, not a finding that a Lake Winnipeg corridor is feasible. The report's job is to identify the question clearly enough for transportation engineers and government to test it.

11. Churchill and Trade — Sio Has Already Seen the Corridor

The Port of Churchill should not be presented as an idea Sio overlooked. On June 18, 2026, Sio and Arctic Gateway Group announced an MOU to explore future exports of SiMBA silica to Europe through Churchill. Initial plans contemplated approximately \$110–124 million in private port infrastructure, including enclosed storage, rail unloading, conveyors, ship loading, utility upgrades and bagging.

That announcement strengthens, rather than weakens, the larger question in this paper. It demonstrates that silica is already being considered as part of a Manitoba-to-Europe trade corridor.

THE CHURCHILL QUESTION

If Manitoba and private partners are examining Churchill infrastructure around SiMBA, has the province undertaken the same whole-chain logistics analysis for alternative Manitoba silica resources and for value-added products manufactured in Manitoba before export?

The strategic objective should not be to maximize tons of raw material leaving Manitoba. It should be to determine which combination of extraction, processing, manufacturing and export produces the strongest long-term Manitoba benefit.

Trade relationships can change with an election or a stroke of a pen. The silica will still be in Manitoba.

12. THE THINK TANK — The Evidence Brought Us This Far. Now Think Bigger.

Everything in this section is deliberately separated from established findings. These are propositions for examination, challenge and development. They should not be read as engineering conclusions or government recommendations.

A GOOD IDEA SHOULD SURVIVE SCRUTINY. A BETTER IDEA SHOULD REPLACE IT.

The purpose of the Think Tank is to connect pieces that are usually examined in separate files and ask whether a coherent Manitoba strategy emerges.

WATER SECURITY	INDIGENOUS PARTICIPATION	ENERGY SECURITY
TRANSPORTATION	MANITOBA'S PUBLIC INTEREST	VALUE-ADDED MANUFACTURING
RESOURCE DEVELOPMENT	TRADE & SUPPLY CHAINS	GENERATIONAL SECURITY

Think Tank propositions

- Could Manitoba commission an independent, apples-to-apples technical and economic comparison of SiMBA and CPS feedstocks for identified end products?
- Could Manitoba facilitate a strategic public-private-Indigenous partnership — without acquiring CPS — that brings together an alternative Manitoba silica resource, beneficiation, Indigenous equity participation, energy, transportation, private investment, international technology partners and downstream manufacturing?
- Could international technology partners associated with one project qualify alternative Manitoba feedstocks after beneficiation?
- Could Selkirk serve as a larger processing/manufacturing node if economics, air quality and infrastructure support it?
- Could Indigenous equity participation extend beyond extraction into energy, logistics and manufacturing?
- Could Manitoba's new generation planning be coordinated with strategic value-added industries without compromising affordability or reliability?
- Could seasonal Lake Winnipeg bulk logistics, modern winter freight and stockpiling be engineered into an economic annual-throughput system?
- Could Churchill export more Manitoba-made intermediate or finished products rather than primarily raw material?
- What near-term products are commercially plausible within five years, what requires a 10–20-year strategy, and what belongs only in a 25–50-year horizon?

The Think Tank is where government, Bob Lagassé, industry, Indigenous partners, engineers, economists and residents can add what an outside researcher cannot see from the public record.

What are we missing?

13. The Missing Questions Ledger

ID	Question for examination
MQ-01	What is the actual industrial and economic value of the apparent 0.35-percentage-point difference?
MQ-02	Are the published SiMBA and CPS purity figures technically comparable, including sampling, test methods, particle size and mineralogy?
MQ-03	Which specific impurities determine suitability for the proposed downstream products?
MQ-04	What beneficiation is required for each resource, and at what capital, operating, energy, water and environmental cost?
MQ-05	Has Manitoba completed an updated whole-of-government comparison of the SiMBA and CPS development pathways?
MQ-06	What measurable groundwater conditions would trigger investigation, mitigation, suspension or shutdown under any SiMBA licence?
MQ-07	What independent monitoring and public reporting would Manitoba require?
MQ-08	What immediate replacement-water commitment would apply if a resident's supply were adversely affected?
MQ-09	What project-specific financial assurance, insurance or security would Manitoba require before operations begin?
MQ-10	Who bears long-term liability after closure or corporate insolvency?
MQ-11	Are Sio's international technology/offtake relationships technically dependent upon the SiMBA resource?

MQ-12	Could alternative Manitoba silica feedstocks be qualified by the same or comparable technology partners?
MQ-13	Could Manitoba facilitate a strategic public-private-Indigenous partnership around an alternative Manitoba silica development pathway — without government acquisition of the resource company — bringing together resource development, beneficiation, energy, transportation, technology partners, private capital and downstream manufacturing?
MQ-14	What percentage of value under each pathway would remain in Manitoba through wages, ownership, taxes, processing and manufacturing?
MQ-15	What public infrastructure, incentives and Hydro capacity would each pathway require?
MQ-16	What Indigenous ownership and governance structures are feasible across extraction, energy, transportation and manufacturing?
MQ-17	What is the best near-term value-added product strategy: glass, specialty silica, silicon metal, battery materials, or another market?
MQ-18	What is the technically and economically preferred Manitoba logistics chain for each resource?
MQ-19	Has Manitoba compared raw-material export through Churchill with export of higher-value Manitoba-processed products?
MQ-20	What cumulative air, traffic, energy and community impacts would arise from a larger Selkirk industrial cluster?
MQ-21	What would Manitoba's best silica and advanced-manufacturing strategy look like if SiMBA did not exist? And if CPS did not exist?

14. A Constructive Path Forward

The Missing Link does not ask Manitoba to prejudge an active regulatory process. It asks Manitoba to widen the examination and show its work.

1. Complete the current environmental review on the evidence applicable to the revised SiMBA proposal.
2. Commission or publish an independent technical comparison of relevant Manitoba silica resources for identified end products, including impurity profiles and beneficiation requirements.
3. Quantify the industrial and economic significance of the apparent purity difference rather than relying on gross assay as a proxy for value.
4. Define, before any approval, the measurable and enforceable groundwater protections, intervention thresholds, independent monitoring, replacement-water obligations and financial assurance Manitoba would require.
5. Compare the net Manitoba value of competing pathways: extraction, processing, Indigenous equity, energy requirements, transportation, manufacturing, taxation, public infrastructure and export value.
6. Bring Environment, Economic Development, Energy/Hydro, Transportation, Indigenous economic development and Trade into a coordinated strategic review rather than leaving the larger question divided among separate files.
7. Examine whether Manitoba can use its convening role to facilitate strategic public-private-Indigenous partnerships capable of advancing the strongest value-added development pathway identified by that review — without requiring government acquisition of a resource company.
8. Publish enough of the resulting analysis for Manitobans to understand why the final pathway serves the public interest.

THE PRINCIPLE

The Missing Link is not an argument for government to reach a particular answer. It is an argument for government to ask a larger question — and to demonstrate the evidence supporting the decision it ultimately makes.

A public-interest test

- Does it protect what Manitobans cannot readily replace?
- Is it technically credible?
- Is it economically competitive?
- Who pays and who carries the risk?
- Who owns and who benefits?
- How much value remains in Manitoba?
- What are the environmental and community consequences?
- What does the pathway contribute to Manitoba 25–50 years from now?

15. Conclusion — Identify the Missing Link

This inquiry began close to home: Springfield's groundwater and a public controversy that has occupied residents, governments and proponents for years.

The deeper question is not whether Manitoba should choose environmental security or economic opportunity. Responsible development requires government to determine whether it can advance both — and whether the pathway being considered is the strongest available pathway when alternatives are examined honestly.

The 100,000 figure reminds us why the water question deserves extraordinary care. The apparent 0.35-percentage-point difference reminds us why technical and economic assumptions should be quantified rather than repeated. CPS reminds us that Manitoba has more than one silica resource pathway. Selkirk, Hydro, Indigenous investment, international technology partnerships and Churchill remind us that the opportunity is larger than extraction.

The missing link may not be another resource. It may be the strategy connecting the resources Manitoba already has.

If rigorous analysis ultimately demonstrates that SiMBA is the strongest public-interest pathway and can proceed with acceptable, enforceable safeguards, government should be prepared to demonstrate why. If the evidence points to another pathway — or a combination of pathways — government should have the confidence to change direction.

Either way, the decision belongs to government under the law. The public's role is to ask questions, examine evidence and insist that decisions affecting water and generational economic opportunity are worthy of the stakes.

THE OPEN CHALLENGE

If a fact in this paper is wrong, identify it and provide superior evidence.

If an assumption is technically unsound, explain why.

If an alternative is impractical, demonstrate the constraint.

If an important consideration is missing, identify it.

And if there is a better pathway for Manitoba, put it on the table.

The objective is not to protect the author's conclusions. It is to identify The Missing Link.

Appendix A — Research Methodology & Verification Standard

This working manuscript uses a source hierarchy intended to reduce avoidable factual and reputational risk. The preferred order is: government/regulatory record; statutory or legislative record; technical/regulatory filing; peer-reviewed or institutional research; corporate filing or company statement; reputable secondary reporting. Advocacy material may identify issues but should not carry a central technical proposition where stronger primary evidence is available.

Classification	Meaning
PRIMARY FACT	Directly supported by a government, statutory, regulatory or other authoritative primary record.
PROPONENT / COMPANY STATEMENT	A statement made by Sio, CPS or another company. It is evidence of what the company says, not independent verification of the underlying proposition.
CALCULATION	Arithmetic derived from identified inputs. Correct arithmetic does not establish that the inputs are technically comparable.
INFERENCE	A reasoned conclusion drawn from evidence but not directly stated by the source.
POLICY PROPOSITION	An idea proposed for government examination.
OPEN QUESTION	A matter the author has not established from the public record reviewed.

Wording rules

- “Not identified in the public record reviewed” is not rewritten as “does not exist.”
- The 2024 Vivian decision is not attributed automatically to the current SiMBA proposal.
- A proponent’s prediction is not rewritten as a government finding.
- A numerical difference is not rewritten as an economic advantage without economic analysis.
- A historical logistics concept is not rewritten as a current feasible route without modern engineering.
- A question is not rewritten as an accusation.
- Counter-evidence is preserved rather than hidden.

Hostile-reader test

Before public release, each material section should be reviewed as though it were being read by Sio’s technical team and counsel, CPS management, Manitoba Environment, a hydrogeologist, a journalist and a political opponent. The purpose is not to make the paper timid. It is to remove loose claims so legitimate questions remain difficult to dismiss.

Appendix B — Core Verification Record

This is the beginning of the companion Research, Sources & Verification Record. Each item identifies what the source proves and, equally important, what it does not prove.

R-001 — Manitoba — 2024 Vivian licence refusal / approximately 100,000 Manitobans

Classification: PRIMARY FACT

Source: Manitoba Government, “Manitoba Government Announces Vivian Sand Proposal Will Not Move Forward,” February 16, 2024.

Link: <https://news.gov.mb.ca/news/index.html?item=62000&posted=2024-02-16>

What it supports: Supports that Manitoba refused the earlier Vivian proposal and stated the CEC identified serious environmental concerns about extraction through aquifers providing drinking water to approximately 100,000 Manitobans.

What it does not prove: Does not establish that the revised current SiMBA proposal will contaminate those aquifers or that the 2024 findings automatically apply unchanged to File 6275.

R-002 — Current SiMBA project status and process

Classification: PRIMARY FACT

Source: Manitoba Environment and Climate Change, Public Registry 6275.00 — Sio Silica SiMba Sand Extraction Project.

Link: <https://www.gov.mb.ca/sd/eal/registries/6275/index.html>

What it supports: Supports the existence of the revised application, current registry record, supporting studies, public/TAC comments and March 2026 additional-information request.

What it does not prove: Does not itself decide whether the project should be approved.

R-003 — SiMBA extraction method and approximately 61 m depth

Classification: PROPONENT STATEMENT IN REGULATORY FILING

Source: Sio Silica Corporation, SiMba Project Environment Act Proposal, Part 1.

Link: https://www.gov.mb.ca/sd/eal/registries/6275/eap_part_1.pdf

What it supports: Supports Sio’s description of the revised phased project, extraction wells, compressed-air lifting of sand with groundwater, target formation depth and proposed uses.

What it does not prove: Predictions and conclusions in the EAP remain proponent evidence subject to regulatory review.

R-004 — SiMBA raw resource averages approximately 99.85% SiO₂

Classification: PROPONENT STATEMENT IN REGULATORY FILING

Source: Sio Silica Corporation, SiMBA Project Environment Act Proposal, Part 1.

Link: https://www.gov.mb.ca/sd/eal/registries/6275/eap_part_1.pdf

What it supports: Supports the reported average raw-resource SiO₂ figure used in the 0.35 inquiry.

What it does not prove: Does not establish technical comparability with CPS assays or the economic value of the difference.

R-005 — CPS produced wet sand approximately 99.5% silica

Classification: REGULATORY TECHNICAL RECORD

Source: AECOM for Canadian Premium Sand, Air Quality Assessment Report, Wanipigow Sand Extraction Project Update, Appendix F.

Link: https://www.gov.mb.ca/sd/eal/registries/5991wanipigow/appendix_f.pdf

What it supports: States extracted sand was calculated at 96.3% silica and produced wet sand at 99.5% silica.

What it does not prove: The figure was used for air-quality modelling and does not by itself prove equivalence with SiMBA feedstock or a specific downstream customer specification.

R-006 — 0.35 percentage-point arithmetic

Classification: CALCULATION

Source: $99.85 - 99.50 = 0.35$ percentage points; $0.0035 \times 1,000 \text{ kg} = 3.5 \text{ kg}$ per tonne.

What it supports: Supports the arithmetic if the two published percentages are used as inputs.

What it does not prove: Does not establish that the materials are technically comparable or that 3.5 kg becomes slag, waste or economic loss.

R-007 — CPS Wanipigow Environment Act Licence No. 3285 R

Classification: PRIMARY FACT

Source: Manitoba Environment and Climate Change, Public Registry File 5991.00.

Link: <https://www.gov.mb.ca/sd/eal/registries/5991wanipigow/index.html>

What it supports: Supports the current Manitoba regulatory record and licence for the Wanipigow project.

What it does not prove: Does not guarantee commercial development.

R-008 — CPS Selkirk Solar-Glass Environment Act Licence No. 3401

Classification: PRIMARY FACT

Source: Manitoba Environment and Climate Change, Public Registry 6137.00.

Link: <https://www.gov.mb.ca/sd/eal/registries/6137/index.html>

What it supports: Manitoba issued Environment Act Licence No. 3401 for the Selkirk solar-glass manufacturing facility.

What it does not prove: Does not establish that financing, construction or commercial operation will occur.

R-009 — CPS strategic review and resource figures

Classification: COMPANY STATEMENT

Source: Canadian Premium Sand Inc., “Announces Strategic Review,” April 16, 2026.

Link: <https://www.globenewswire.com/news-release/2026/04/16/3275187/0/en/Canadian-Premium-Sand-Inc-Announces-Strategic-Review.html>

What it supports: Supports CPS’s stated strategic alternatives, 42.3 Mt measured/indicated resource, 24.4 Mt inferred low-iron subset and references to its Manitoba environmental licences.

What it does not prove: Resource classifications and strategic alternatives are company disclosures; no specific transaction or development outcome is guaranteed.

R-010 — Sio / RCT / NanoXSolar partnerships and Manitoba solar hub

Classification: GOVERNMENT + COMPANY ANNOUNCEMENT

Source: Prime Minister of Canada backgrounder and Sio Silica announcement, June 17, 2026.

Link: <https://www.pm.gc.ca/en/news/backgrounders/2026/06/17/prime-minister-carney-secures-new-partnerships-defence-and-critical>

What it supports: Supports that MOUs/partnerships involving Sio, RCT Solutions and NanoXSolar were publicly announced and that an integrated solar manufacturing hub in Manitoba is being explored.

What it does not prove: Does not establish that the partnerships could or could not use CPS feedstock; that requires technical/customer qualification.

R-011 — Sio / Arctic Gateway Churchill MOU

Classification: COMPANY / INFRASTRUCTURE PARTNER ANNOUNCEMENT

Source: Arctic Gateway Group, June 18, 2026.

Link: <https://www.arcticgateway.com/agg-news/newsroom/sio-silica-and-arctic-gateway-group-sign-strategic-mou-to-explore-future-exports-of-high-quality-silica-from-the-port-of-churchill-to-europe>

What it supports: Supports an MOU to explore SiMBA silica exports through Churchill and initial contemplated private infrastructure of roughly \$110–124 million.

What it does not prove: An MOU and initial estimate do not establish final investment, construction, throughput or economics.

R-012 — Manitoba advanced-manufacturing / semiconductor opportunity

Classification: PRIMARY GOVERNMENT POLICY

Source: Government of Manitoba, Manitoba’s Economic Development Strategy.

Link: https://www.gov.mb.ca/asset_library/en/eds/economic-development-strategy.pdf

What it supports: Supports that Manitoba identifies semiconductor fabrication as an emerging advanced-manufacturing opportunity and notes silicon, gallium and germanium as base materials.

What it does not prove: Does not establish that a semiconductor fab is presently commercially viable in Manitoba.

R-013 — Manitoba Hydro generation and energy expansion

Classification: PRIMARY / CROWN UTILITY

Source: Manitoba Hydro, 2025 Integrated Resource Plan; Manitoba Affordable Energy Plan.

Link: <https://www.hydro.mb.ca/corporate/planning/>

What it supports: Supports Manitoba Hydro’s statement that up to 97% of the electricity it produces comes from water, as well as growing demand, limited supply, up to 600 MW of Indigenous-majority-owned wind and preparation for approximately 750 MW of dispatchable combustion turbines.

What it does not prove: Does not imply Manitoba has unlimited surplus electricity for new industry.

R-014 — Environment Act licences may include financial assurance

Classification: PRIMARY GOVERNMENT GUIDANCE

Source: Manitoba Environment and Climate Change, “Do I Need a License?”

Link: https://www.gov.mb.ca/sd/permits_licenses_approvals/eal/licence/index.html

What it supports: Supports that site-specific licenses may include requirements for monitoring, reporting, decommissioning and financial assurance.

What it does not prove: Does not establish what project-specific financial assurance would be imposed on SiMBA if licensed.

R-015 — SiMBA emergency response planning

Classification: PROPONENT STATEMENT IN REGULATORY FILING

Source: Sio Silica Corporation, SiMBA Environment Act Proposal Part 2, section 7.6.

Link: https://www.gov.mb.ca/sd/eal/registries/6275/eap_part_2.pdf

What it supports: Supports that Sio includes an Environmental Emergency Response Contingency Plan in its proposal.

What it does not prove: Does not answer all questions about replacement water, financial assurance, stop-work thresholds or long-term liability.

R-016 — CPS December 2025 project-development pause

Classification: COMPANY STATEMENT

Source: Canadian Premium Sand Inc., “Provides Corporate Update, Announces Extension of Convertible Debenture Maturity Date and Fiscal Year-End 2025 Results,” December 17, 2025.

Link: <https://www.globenewswire.com/news-release/2025/12/17/3207360/0/en/Canadian-Premium-Sand-Inc-Provides-Corporate-Update-Announces-Extension-of-Convertible-Debenture-Maturity-Date-and-Fiscal-Year-End-2025-Results.html>

What it supports: Supports that CPS reported it had elected to pause further development of its two patterned solar-glass projects until there is stability in trade policy and the geopolitical landscape.

What it does not prove: Does not establish that the Selkirk project has been permanently cancelled or that future development will occur.

Appendix C — Provenance: Correspondence That Started the Inquiry

The following chronology is retained because it establishes how the inquiry developed. It is not offered as proof of the technical propositions in the report.

Date	Development
June 20, 2026	Edwin Giesbrecht emailed Bob Lagassé: “The Missing Question in Manitoba’s Silica Debate: A Question of Responsible Development,” subject “Manitoba’s Silica Strategy Deserves a Broader Discussion.” Recipients copied included Premier Wab Kinew, Deputy Minister Daniel Blaikie, Steven Sukkau and The Carillon editor.
July 27, 2026	Constituency Assistant for MLA Bob Lagassé, on behalf of Bob Lagassé, replied that the email “raised several important points,” was valuable to the office and “has contributed to our ongoing review of this issue.”
July 28, 2026	Giesbrecht replied that his research was continuing and welcomed further discussion.
July 29, 2026	Manitoba Environment’s Environmental Stewardship Division responded to the earlier correspondence, confirming the 2024 refusal and that a re-application was under technical/environmental review.
August 2026	After the Ministerial/departamental response was forwarded, Lagassé’s office asked to schedule an in-person meeting to continue the discussion.
September 2026	The continuing research was organized into THE MISSING LINK: a broader inquiry into water security, comparative resources, value-added manufacturing, energy, transportation, Indigenous participation and trade.

Presentation and sharing

This report may be shared and reproduced for public-policy discussion, research and review, provided it is reproduced accurately and attribution to the author is retained.

A presentation copy may be provided to Bob Lagassé, MLA for Dawson Trail, in appreciation for the opportunity to continue the discussion that helped prompt further inquiry.

**Protect the water. Quantify the 0.35. Compare the alternatives.
Capture Manitoba's value. Build the industrial chain here.**

j

THE FUTURE IS HERE



A FINAL MISSING LINK

There may be one final Missing Link.

This paper began with a question about Manitoba's silica strategy, groundwater protection and the apparent difference between two Manitoba silica resources. It widened into questions of beneficiation, energy, transportation, Indigenous participation, manufacturing, international partnerships and the industrial chain Manitoba might build around a resource it already possesses.

One further question now deserves to be added.

Sio Silica's naturally high-purity resource is unquestionably significant. A raw silica resource reported at approximately 99.85% SiO₂ may provide a genuine processing and economic advantage for particular applications.

But the existence of an advantage is not the same as establishing its value.

And where obtaining that resource involves extraction from a geological formation that also functions as an important groundwater system, Manitoba should know precisely what that advantage is worth.

START WITH EXTRACTION — BEFORE PURITY

Before assigning an economic premium to natural silica purity, Manitoba should first compare the cost and consequence of getting each recovered tonne out of the ground.

The two resources present fundamentally different extraction pathways.

Canadian Premium Sand proposes conventional near-surface quarry extraction. The project's Environment Act licensing record limits active mining to an area not exceeding five hectares — approximately 12.4 acres — at any one time, with restoration and rehabilitation required as mining progresses.

The environmental record describes progressive reclamation: depleted quarry cells are backfilled, stockpiled soil is replaced, revegetation begins, and restored areas are monitored to determine whether additional seeding or planting is required.

In practical terms, the extraction footprint moves forward while reclamation follows behind it.

SiMBA proposes an entirely different engineering pathway: drilling extraction wells approximately 170 to 200 feet below ground into the Winnipeg Sandstone aquifer, installing and grouting casing through geological formations, using compressed-air airlift extraction and groundwater to bring sand to the surface, transporting the resulting slurry, treating and returning groundwater, and ultimately decommissioning the extraction wells.

Those are not merely different ways of reaching silica.

They are fundamentally different cost structures, engineering systems and environmental risk profiles.

THE FIRST COMPARISON

What is the fully loaded cost per recovered tonne of conventional near-surface CPS extraction compared with SiMBA's deep-well extraction system?

The calculation should include drilling, casing, grouting, compressors, pumping, slurry handling, groundwater treatment and reinjection, energy, recovery rates, monitoring, rehabilitation, well decommissioning and long-term environmental obligations.

Manitoba should publish that comparison.

THEN COMPARE BENEFICIATION

Extraction is only the beginning.

The published purity figures examined in this paper do not represent precisely the same point in the production chain.

Sio reports naturally high-purity quartz at approximately 99.85% SiO₂ before processing. Sio also describes washing and beneficiation to achieve particular low-iron specifications and higher processed purity.

CPS begins with lower-purity raw material and uses additional conventional beneficiation steps to produce approximately 99.5% SiO₂ wet sand.

That distinction matters.

It means the economic question is not:

Beneficiation versus no beneficiation.

It is:

How much beneficiation does each resource require to reach the SAME commercially required specification — and what does that processing actually cost per tonne?

A higher-purity starting material may require fewer processing steps. That may be a genuine competitive advantage.

But the magnitude of that advantage should be calculated rather than assumed.

THE PROPER COMPARISON

$$\begin{aligned} &\text{EXTRACTION COST} + \text{RECOVERY} + \text{BENEFICIATION COST} \\ &= \\ &\text{COST OF COMPARABLE FEEDSTOCK} \end{aligned}$$

That comparison should initially be made at the pre-smelting stage.

It should come before any subsequent high-temperature carbothermic electric-arc conversion that might be required to manufacture silicon metal, and before further purification and manufacturing required for particular downstream silicon products.

This separates two questions that should not be confused:

What does it cost to produce comparable silica feedstock?

and

What should Manitoba manufacture from it?

Only after the first question is answered can Manitoba determine the actual economic premium created by SiMBA's naturally higher starting purity.

And only then can that premium be fairly weighed against the different consequences of obtaining the resource.

AND THEN THERE IS TECHNOLOGY

THE FUTURE IS ALREADY ARRIVING.

While Manitoba considers how to develop its silica resources, some of the world's most advanced materials and electronics industries are redesigning the technologies that consume silicon, glass, ceramics and other materials.

One example is particularly instructive.

Ensinger is commercializing TECAWAFER and TECASUB — PEEK-based substrate technologies marketed as alternatives to conventional silicon, glass and ceramic substrates for particular microsystems and electronics applications.

TECAWAFER brings familiar semiconductor-wafer geometry into a high-performance polymer substrate capable of processes involving lithography, thin-film deposition, laser structuring, drilling and electrical interconnection.

TECASUB moves further toward flexible film substrates and roll-to-roll manufacturing.

These technologies do not establish that PEEK is replacing silicon semiconductor chips, nor do they establish that polymer substrates will replace the crystalline-silicon absorber in conventional photovoltaic cells.

That is not the point.

The point is that the architecture surrounding silicon is changing.

Around the world, development is advancing in glass-core substrates, organic interposers, polymer substrates, through-glass vias, chiplets, advanced packaging and heterogeneous integration.

Japan, South Korea, Taiwan, Europe and the United States are not waiting to discover what tomorrow's electronics industry will look like.

They are building it.

PHOTOVOLTAICS IS MOVING TOO

This matters directly to any Manitoba strategy contemplating solar manufacturing.

Conventional crystalline-silicon photovoltaics remain dominant. Silicon should not be written out of Manitoba's future.

But neither should Manitoba assume that today's photovoltaic architecture will remain unchanged for the next 25 or 50 years.

Industry and researchers are pursuing thinner silicon wafers, lower-cost wafer-manufacturing processes, perovskite-silicon tandem cells, thin-film photovoltaics, flexible photovoltaic substrates and scalable deposition technologies.

Some technologies may use silicon more efficiently.

Some may combine silicon with entirely different photovoltaic materials.

Some may reduce the quantity of silicon required for a given unit of output.

And some specialized applications may not require a conventional crystalline-silicon wafer at all.

None of this establishes that silica, glass or silicon is becoming obsolete.

It establishes something much more important for long-term public policy:

THE TECHNOLOGIES THAT DETERMINE THE FUTURE VALUE OF SILICA, GLASS AND SILICON ARE NOT STANDING STILL.

That matters when governments contemplate infrastructure, regulatory decisions and resource-development strategies whose consequences may extend across generations.

SO WHAT IS THE ADVANTAGE ACTUALLY WORTH?

The discussion can now return to the question that started it.

The apparent difference between approximately 99.85% SiO₂ and approximately 99.5% SiO₂ may be technically and economically important.

But how important?

That question cannot be answered by assay percentages alone.

QUESTIONS MANITOBA SHOULD BE ABLE TO ANSWER

What does it cost to extract one recovered tonne of CPS material?

What does it cost to extract one recovered tonne of SiMBA material?

What does it cost to beneficiate each resource to the SAME required commercial specification?

What is the comparable pre-smelting cost per tonne?

What additional economic value does SiMBA's naturally higher purity actually create after extraction and beneficiation costs are included?

And finally:

How durable is that economic premium if wafers, photovoltaic technologies, substrates, advanced packaging and manufacturing processes continue to change?

Those are not questions for science fiction.

The technologies driving those questions exist today.

A 25-50 YEAR TEST

Manitoba should not evaluate a generational resource strategy solely against the technologies and commodity markets of 2026.

The proper question is whether the competitive advantage remains meaningful across the period during which Manitoba and Manitobans will carry both the benefits and the consequences of the decisions made today.

If thinner wafers reduce silicon requirements, that matters.

If lower-cost wafer manufacturing changes downstream economics, that matters.

If perovskite-silicon tandems alter the relationship between silicon consumption and photovoltaic output, that matters.

If glass-core, polymer or other substrate technologies displace silicon or ceramics in particular applications, that matters.

If new applications increase demand for high-purity silica or silicon, that matters too.

The purpose of a technology stress test is not to predict a single winner.

It is to determine whether Manitoba's strategy remains resilient under more than one plausible future.

THE PUBLIC-INTEREST TEST

The question is therefore larger than whether Manitoba possesses an exceptional silica resource.

It plainly does.

Nor is the question whether high natural purity has value.

It plainly may.

The question is whether Manitoba has demonstrated where that purity provides an economically durable and technologically defensible competitive advantage — and what that advantage is actually worth.

Only after that advantage has been quantified can it properly be weighed against the different environmental consequences and risks associated with obtaining the resource.

That leads to a question Manitoba ultimately cannot avoid:

How large — and how durable — must the demonstrated economic advantage be before it justifies accepting risk to an essential groundwater resource, particularly where some consequences, if they occurred, could not simply be reversed by writing a cheque?

That is not an argument against Sio Silica.

It is not an argument against CPS.

It is not an argument against silica development.

And it is not an argument for government to prejudge an active regulatory process.

It is an argument for getting Manitoba's silica strategy right.

If rigorous analysis demonstrates that SiMBA provides the strongest public-interest pathway and can proceed with acceptable, enforceable safeguards, government should be prepared to demonstrate why.

If the evidence points toward another pathway — or a combination of pathways — government should have the confidence to pursue it.

The resource should serve the strategy.

The strategy should not be built merely to serve the resource.

THE PATHWAY MANITOBA NEEDS TO COMPARE

RESOURCE & COST

**RAW RESOURCE → EXTRACTION → RECOVERY → BENEFICIATION → REQUIRED
SPECIFICATION → PRE-SMELTING COST**

VALUE & TECHNOLOGY

**DOWNSTREAM MANUFACTURING → WAFERS & SUBSTRATES → PHOTOVOLTAICS &
ADVANCED PACKAGING → FUTURE TECHNOLOGY**

PUBLIC INTEREST
ENVIRONMENTAL RISK → PUBLIC VALUE

THE FINAL MISSING LINK

Manitoba's silica has been underground for millions of years.

It will still be there tomorrow.

But wafers are changing.

Substrates are changing.

Photovoltaics are changing.

Manufacturing is changing.

Global competition is changing.

The opportunity is not simply to extract silica before somebody else does.

The opportunity is to understand where Manitoba holds a durable advantage, protect the resources that cannot readily be replaced, and build the industrial chain capable of capturing value as technology changes around it.

That is a larger ambition than selling sand.

It is a larger ambition than choosing between two projects.

It is a strategy for deciding what Manitoba wants its resources to become.

The future is no longer something Manitoba needs to predict.

THE FUTURE IS HERE.

Protect the water.

Quantify the extraction cost.

Quantify the purity advantage.

Compare the alternatives.

Stress-test the technology.

Capture Manitoba's value.

Build the industrial chain that can compete with the future.

Plan for the next generation.

Perhaps that is the final Missing Link.

RETURN TO THE MISSING LINK