



Jon Gerrard MLA River Heights

Submission to CEC re Sio Silica Sand Extraction proposal

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MLA-River Heights

Mr Jonathan Scarth
Chair
Clean Environment Commission
305-155 Carlton Street
Winnipeg, Manitoba R3C 3H8

Dear Mr Scarth

This letter represents a written submission to the CEC in relation to the Sio Silica Sand Extraction Project (Public Registry 6119.00).

In this submission, I will raise concerns about three aspects of the proposal, 1) The importance of keeping groundwater free of pollution. 2) The proposal to use a room and pillar approach to extracting (mining) the silica sand. 3) The liability of the company from the possible contamination of the aquifers (sandstone and carbonate).

1) The importance of keeping groundwater free from pollution.

The government's Throne Speech says, "Water is our most valued resource, and every drop counts." The government's recently released (November 2022) Water Management Strategy says its vision is "Healthy waters that support resilient, thriving ecosystems, communities and economies for generations of Manitobans." Its mission is "the stewardship and protection of Manitoba's waters to meet environmental, social and economic needs today and tomorrow." One of the major focuses of the Water Strategy is "Protect the quality and quantity of groundwater". Within this focus the strategy emphasizes the importance of "value groundwater and sustainably manage and protect the resource" and "identify and communicate and mitigate groundwater quality and quantity issues."

The strategy mentions the Assiniboine Delta Aquifer and the Oak Lake Aquifer but sadly fails to mention the incredibly important aquifers in south-eastern Manitoba which are the subject of this review. The strategy also mentions the importance of having defined sustainable withdrawal limits and local aquifer management plans. Sadly, for southeastern Manitoba there are neither defined sustainable withdrawal limits nor local aquifer management plans. Both sustainable withdrawal limits and local management plans should be in place before the Silo Silica Sand proposal should even be seriously considered. A previous CEC report of a number of years ago recommended that there be a sustainable withdrawal limit defined for the SE Manitoba aquifers. It is disgraceful that in the years since this has not been done.



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2) The proposed use of a room and pillar approach to sand extraction.

In the presentation by Sio Silica Sand to the Springfield Chamber of Commerce on November 17 2021, the company talked about its use of a room and pillar approach to the extraction of the sand. This was an integral aspect in their extraction effort. In this approach as applied to hard rock mining, the rock is extracted from a “room” cavity leaving “pillars” on the sides of the room which will hold up the layers of ground above the mine and prevent subsidence. In hard rock mining the pillars are rock pillars and function like the walls of a house to hold up the layers above the area where the rock containing the mineral is extracted.

To use a room and pillar approach to a sand mine, where the sand itself is in an aquifer is an altogether different situation. In this case, the sand does not form a conventional “pillar”. Indeed, the sand will naturally slope down – and as calculated water filled sand will naturally form an “angle of repose” of about 15-30 degrees. [Hamzah M et al. 2018. *A review on the angle of repose of granular materials*. Powder Technology. 330. 397-417. 10.1016/j.powtec.2018.02.003.]. If the extraction sites are a long distance apart, it is possible that the sloped sand can still form some sort of “pillar”. However, the proposal is for extraction sites which are 18m apart. Under these conditions, the sand is unlikely to be able to form an adequate pillar (Fig 1). The results of not forming an adequate pillar are several and include -intermixing of the waters of the two aquifers and subsidence of the ground above the extraction site(s). The company is planning to operate up to 467 extraction wells annually.

The CEC needs to review with care the proposed use of the room and pillar approach to mining sand. It is highly likely that significant problems will occur if the company uses this approach to mining the silica sand.

3) The issue of liability for contamination from the proposed sand mine is a significant issue.

As has been pointed out in previous presentations by others(see comments from D.M. LeNeveu, Public Comments 1, pg.3 File No. 6119.00), the potential for contamination of one or both aquifers is significant. The injection of air into the aquifer (which is part of the planned proposal – see EAP Sec 2.2), can cause oxidation of the sulfides and could make the water not usable for human consumption. Given the size of the aquifer and the large number of extraction sites proposed (7 wells per extraction site, which may now be 5, with at least 56 well clusters annually) contamination of one or both aquifers could have serious ramifications. Such groundwater contamination is hard to reverse and the impact could be long lasting.

According to Manitoba Law, the Contaminated Sites Remediation Act puts the responsibility of cleaning up contamination on the company which is involved with the resource development. It would therefore be important that the Clean Environment Commission, in its review, looks at the situation that would happen if significant contamination did occur and the water became unusable. Several questions arise here.

1) What would be the extent of the contamination?



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- 2) What would be the cost or even the possibility to clean up the contamination?
- 3) If the contamination of the groundwater cannot be cleaned up, what are the long term costs of replacing the high quality water for people who have relied upon it?
- 4) What are the long run costs to the community and the municipality should there be contamination of the groundwater in terms of lost opportunity for long run development in the area due to potential irreversible contamination?
- 5) What should be the size of the “security” put up by the company in case there is contamination?
- 6) Does the company itself have enough long run stability to be able to look after the potential liabilities?

These are all questions which the CEC needs to explore before giving an approval for this sand extraction project.



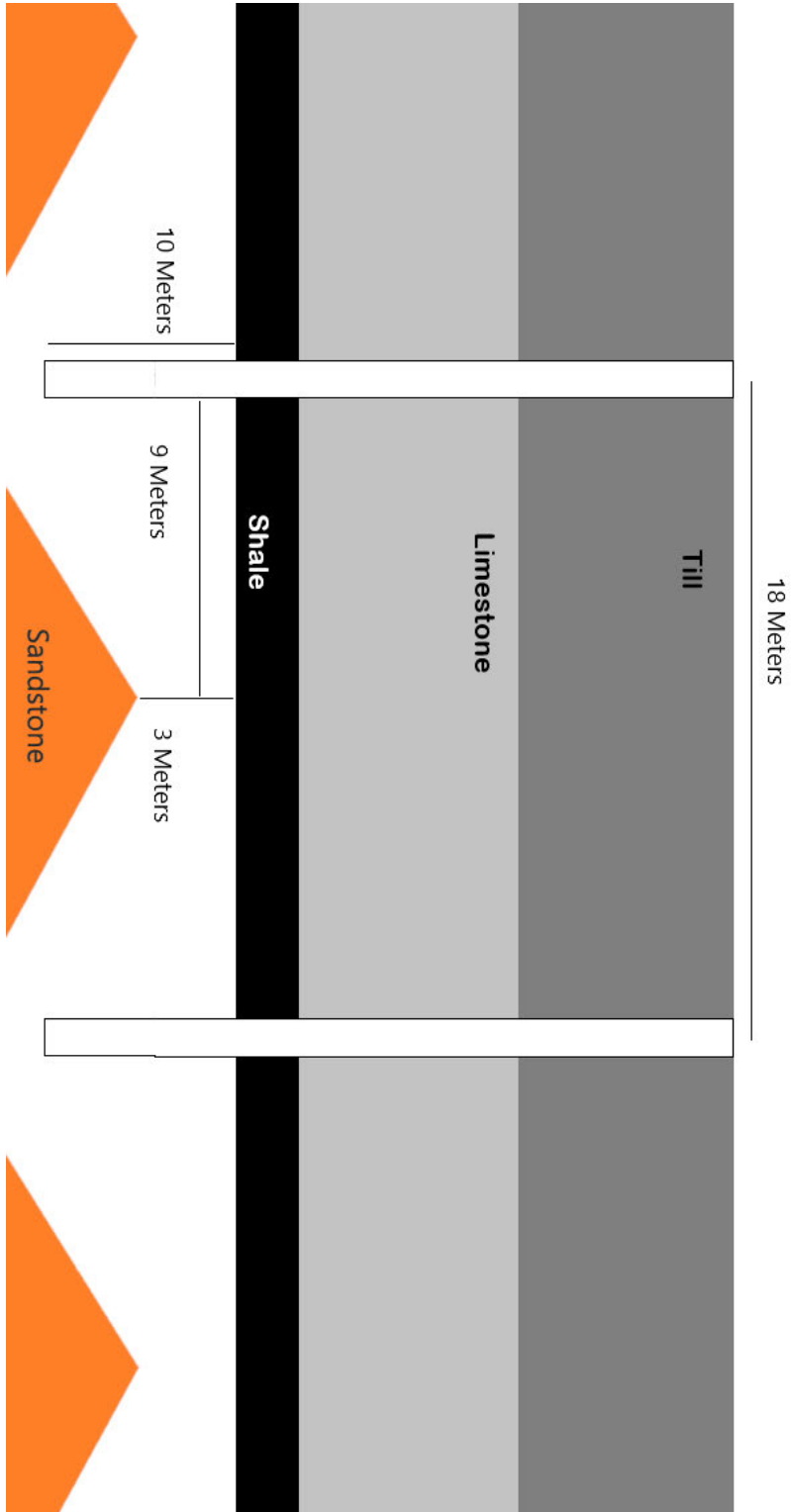
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Appendix A – Room and Pillar in Sand Formations

Fig 1. Within a well extraction site. The “angle of repose” of the sand is too shallow to allow for a “pillar” to develop between extraction sites. Assuming a well depth of 10m below the shale aquitard, the sand will leave a gap of 3 meters at its highest point.



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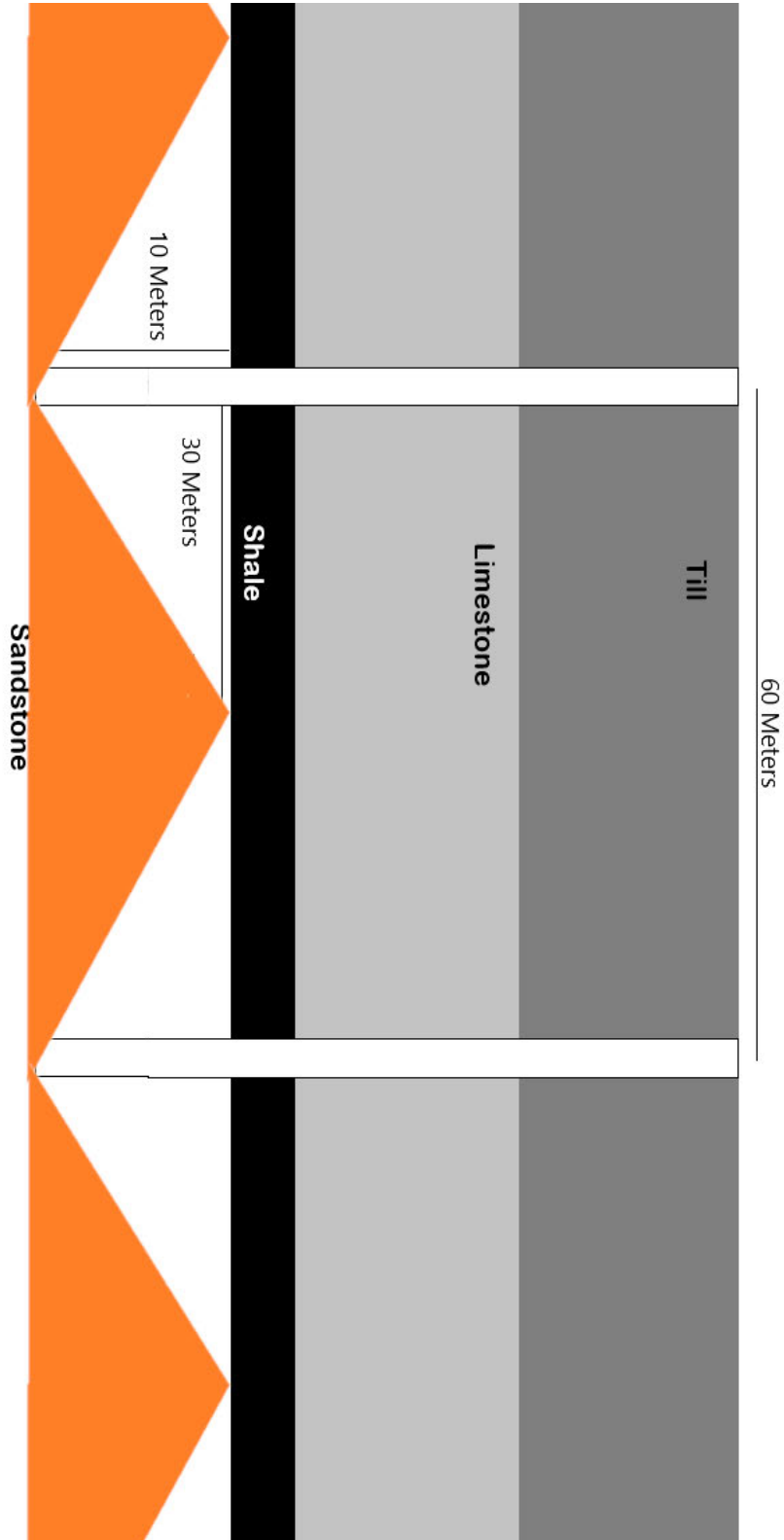


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Fig. 2 Between “Well Clusters”. The “angle of repose” of the sand is just enough to allow for the sand to reach the top of the shale aquitard. Note that this does not create the necessary “pillar” between extraction sites to allow the shale to be supported.



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Appendix B - Relevant sections of *The Contaminated Sites Remediation Act*

Designation of contaminated site

Sec. [7\(1\)](#)

If the director determines that a site is contaminated at a level which poses a threat to human health or safety or to the environment, the director shall by written order designate the site as a contaminated site and, as soon as is reasonably practicable after making the designation, shall.

- (a) where the site includes or forms part of specific land described in a certificate of title under *The Real Property Act* or in an abstract book under *The Registry Act*, cause a notice of the designation to be filed in respect of the specific land in the proper land titles office or registry office;
- (b) send a notice of the designation to
 - (i) each person who at the time of filing the notice under clause (a)
 - (A) is a registered owner of the site, or
 - (B) has a registered interest in land that includes or forms part of the site, and
 - (ii) each municipality within whose jurisdiction all or any part of the site is located; and
- (c) file or cause to be filed in the registry a notice of the designation and any other information regarding the site that is required by regulation to be filed in the registry.

Determining costs of remediation

Sec. [17\(6\)](#)

The director may and shall if requested by a person responsible for the remediation of a contaminated site, determine the costs of remediation of the site, including the value of work done or materials, equipment or other property provided for use in the remediation as permitted or required by the director, and shall send a notice of the determination to each person who is responsible for the remediation.

Costs of emergency remediation a debt to government

[33\(1.1\)](#)



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The costs incurred by the government in carrying out emergency remediation under section 14.4 or subsection 17(5), or causing such work to be carried out, are a debt due to the government by the person or persons responsible under this Act for remediation of the site in question.