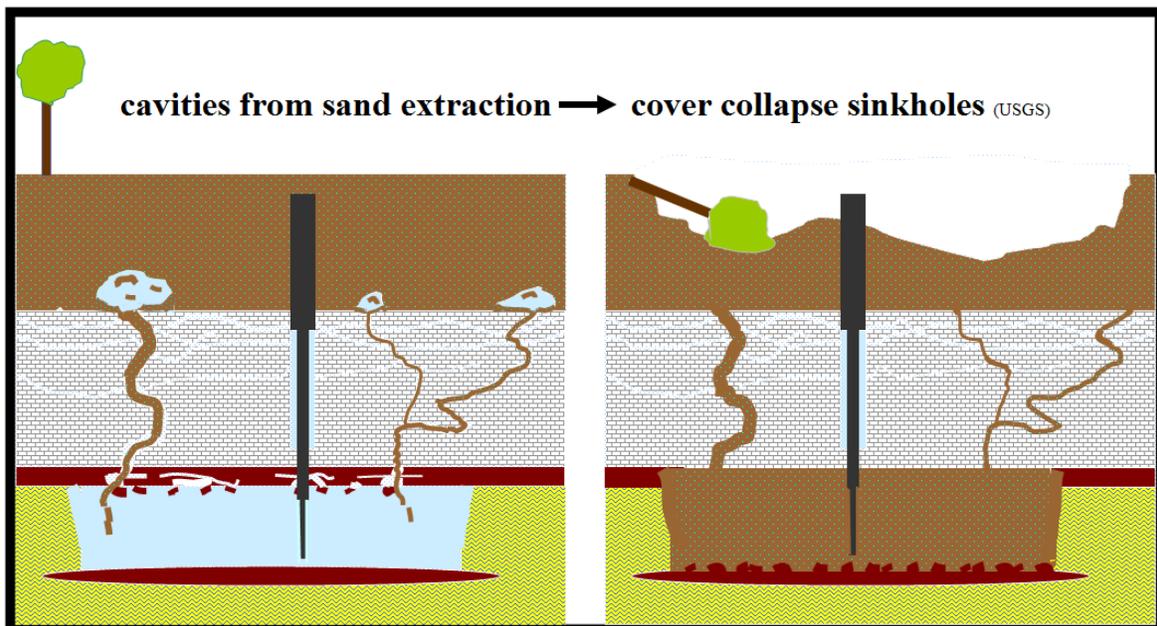
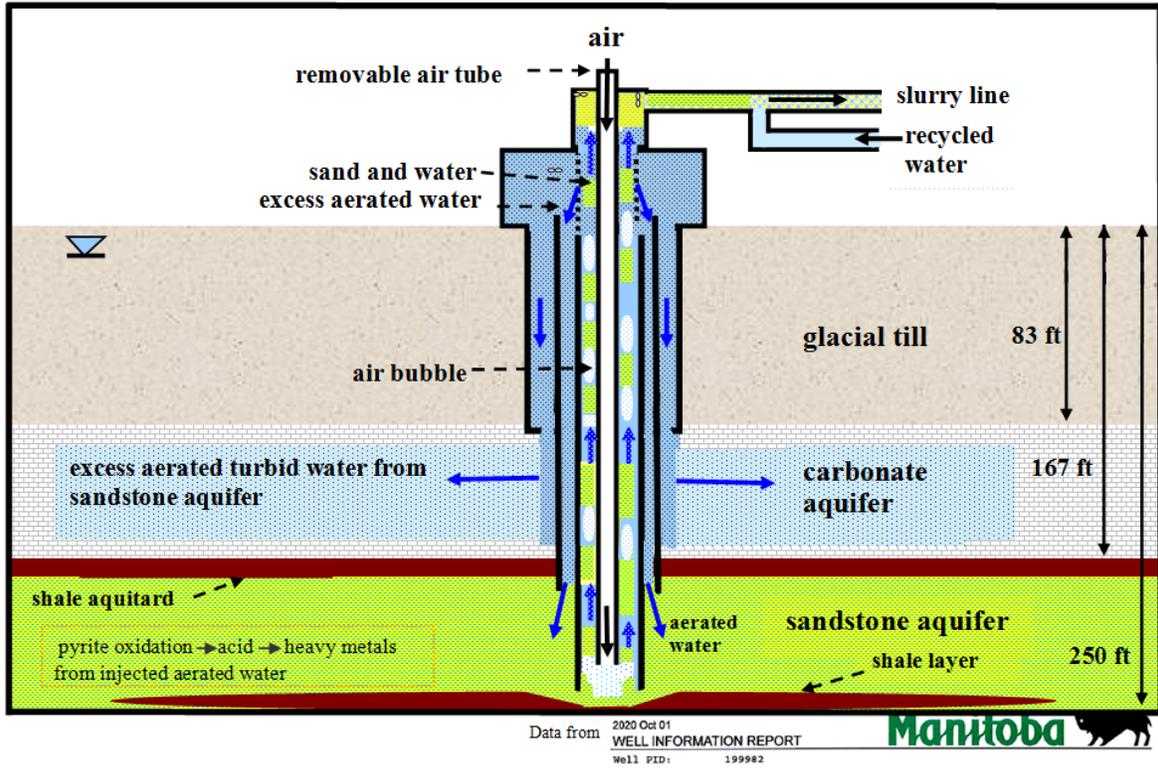


# REPORT HIGHLIGHTS

February 16, 2021



- According to information from the well records obtained from the Manitoba Government, excess water from sand extraction in the sandstone aquifer would be pumped via the outer well tube and the open hole below into the carbonate aquifer violating the regulation of the Manitoba Groundwater and Well Water Act prohibiting mixing of aquifer waters.
- The large amount of excess water injected into the carbonate aquifer will result in an unsustainable draw on the sandstone aquifer.
- Marcasite coated sand, pyritic oolite and shale fragments withdrawn in the extraction process will be exposed to aerated water in the air lifting tube. The aerated water will oxidize the pyrite and marcasite to form acid that will mobilize heavy metals. Excess water returned to the carbonate aquifer will contain some acid, heavy metals and fine sand and silt contaminating the carbonate aquifer and degrading the water quality.
- If aerated excess water were returned to the sandstone aquifer pyrite would be oxidized to form acid that would mobilize heavy metals contaminating the aquifer. Pyrite is in the shale aquitard overlying the sandstone and in shale layers and oolite nodules found in the sandstone. The sand grains in the sandstone aquifer are coated with marcasite (white pyrite) that would also be oxidized when exposed to aerated returned excess water.
- The evidence given in this report demonstrates irreparable damage to both aquifers could occur.
- Contamination in slurry line including highly toxic acrylamide from the break down of polyacrylamide in the clarifier tank, acid and heavy metals would accumulate in the recycled water of the closed loop system. The accumulation of acid and other contaminants would prevent indefinite recycling necessitating disposal of recycled water. The CWS Environment Act Proposal does not include any reference on how they intend to dispose of contaminated recycled water and potentially acid generating mud cake waste from the clarifier tank and drill mud and cuttings from the numerous CWS extraction wells.
- Since 2017 CWS has received 16 temporary authorizations from the Manitoba Drainage and Water Rights Licensing Branch to pump water to the surface at rates of between 350 to 1500 US gallons per minute. These temporary authorizations imply that water discharge occurred. Discharge has been verified by a June 7, 2019 Google Earth image showing water around CWS sand piles extracted near Vivian, Manitoba.
- Discharged water is liable to be contaminated with heavy metals and acid from oxidation of pyrite in sand by air used to lift the sand from the aquifer. Excess water could have been returned to the formation as well by separate injection wells or sand extraction wells degrading the water quality in the aquifers.
- Extremely toxic acrylamide monomer from the breakdown of polyacrylamide used in the processing plant clarifier tank could enter the water table from slurry line spillage, wash plant leakage and leakage from the French drain system used to collect contaminated water from sand stockpile runoff.

- Land subsidence and sinkholes are expected to occur as a result. The occurrence of subsidence and sinkholes would increase each year as the area of CWS wells advance.
- An independent publicly available rock mechanics study should be funded by CPS to evaluate the potential for land subsidence caused by CPS sand extraction.
- Several residents of Springfield Manitoba on Feb.1, 2021, filed a report with the Director of the Manitoba Water Science and Management of suspected violations of the Manitoba Groundwater and Water Well Act. The report includes complaints of deterioration of their well water quality since the start of CWS advanced exploration activities in the area. The results of the investigation into the complaint should be publicly available.
- Slurry lines will extend over a large area outside the plant site. According to CWS high-density poly pipe (HDPE) will be used for the slurry lines. There are many failure modes for the slurry pipe including joint failure, accidental impact, deterioration from UV, embrittlement in winter, and pressure surges from water hammer. Spillage of contaminated water will likely occur during line movement every five days for each new extraction well.
- An independent publicly available baseline survey of trace metal, acrylamide content and water quality in representative wells in both the carbonate and sandstone aquifers over the entire mine claim area should be funded by CWS.
- An independent publicly available geochemical analysis on representative core samples taken over the entire CWS claim area should be funded by CPS. The analysis of the sand, shale and oolite should include an acid-base accounting test and heavy metal content.
- The Winnipeg aqueduct which crosses the CWS mineral lease area is known to leak. When slurry lines approach within drainage distance of or cross the Winnipeg aqueduct, the aqueduct water should be regularly sampled for acrylamide, heavy metals and change of water quality.
- Prior to commencement of advanced exploration activities that according to the drilling records substantially began in 2018, CWS did not file a mine closure plan and financial assurance with the Director of the Manitoba Mines Branch as required by the Manitoba Mines and Minerals Act.
- The legally required mine closure plan was not submitted as part of the CWS Environment Act Proposal of July 2, 2020, for the CWS processing facility. The public and the TAC did not have the opportunity to review the mine closure plan that should have contained essential information on protection of the environment, rehabilitation and minimizing hazards to public safety as required by the Manitoba Mines and Minerals Act.