



Cold Spring Groundwater Study

Annual Report to the Legislature

Issued 12/08/2021

This report was prepared in response to Laws of 2016, Chapter 189, Article 3, Section 44, Part b

The commissioner must conduct necessary monitoring of stream flow and water levels and develop a groundwater model to determine the amount of water that can be sustainably pumped in the area of Cold Spring Creek for area businesses, agriculture, and city needs. Beginning July 1, 2017, the commissioner must submit an annual progress report to the chairs and ranking minority members of the House of Representatives and Senate committees and divisions with jurisdiction over environment and natural resources. The commissioner must submit a final report by January 15, 2022.

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As requested by Minnesota Statute 3.197, this report cost approximately \$1,007 to prepare, including staff time, printing and mailing expenses.

Upon request, this material will be made available in an alternative format such as large print, Braille or audio recording. Printed on recycled paper.

Background and Overview

The 2016 Minnesota Legislature directed the Minnesota Department of Natural Resources (DNR) to “conduct necessary monitoring of stream flow and water levels and develop a groundwater model to determine the amount of water that can be sustainably pumped in the area of Cold Spring Creek for area businesses, agriculture, and city needs.”

This represents the fifth annual report, as required in the 2016 legislation.

Multiple scientific investigations demonstrate that groundwater pumping in and around the City of Cold Spring (City) reduces groundwater flow into Cold Spring Creek, a designated trout stream. The glacial aquifer system, which is strongly connected to Cold Spring Creek, supplies groundwater to the City, Cold Spring Brewing Company (CSBC), and numerous private residential wells and agricultural irrigation wells.

The City and CSBC are actively planning for potential growth and developing strategies to meet their current and anticipated water supply needs in a sustainable manner. To support these efforts, DNR has built a groundwater flow model that can be used to determine current and projected effects of groundwater use on streamflow in Cold Spring Creek. DNR built the model using all available data through 2018. DNR convened a technical advisory group (TAG) consisting of outside groundwater experts with modeling expertise to review and advise model development.

The model calculates the average effect of groundwater use on base flow in Cold Spring Creek over a long period of time (years to decades). The model can also predict how changing pumping in the area of interest will affect base flow in the creek. The model is sufficient to approximate how much water can be sustainably pumped from the City and CSBC wells while maintaining adequate stream flow in Cold Spring Creek.

Tasks completed during fiscal year 2021 included the following:

- Continued monitoring of flow in Cold Spring Creek and water levels in observation wells;
- Published Cold Spring Groundwater Study Technical Findings of Fact;
- Issued a correction to the Groundwater Study Model Report;
- Met with the City to discuss an amendment to its current water appropriations permit; and
- Reviewed and processed amendment request by the City.

In-progress tasks include the following:

- Collecting streamflow and water level data; and
- Reviewing request to extend CSBC permit until the City can build a water tower.

Data Collection

The DNR continues to operate two continuous stream flow gages and three flow measurement sites along Cold Spring Creek, as well as measuring groundwater levels at 12 observation wells in the study area. DNR is evaluating the ongoing data collection and monitoring needs following the 2021 data collection year and may reduce its scope, if appropriate.

Groundwater Model Summary

The DNR completed the refined groundwater model for the Cold Spring area in December 2019. We subsequently found that the model report and annual report to the legislature included an error in calculating flow impacts to Cold Spring Creek. We corrected the error and revised the reports. In the original report, base flow depletion in Cold Spring Creek had been miscalculated by -2.1 to +1.1 percent. The magnitude of the error and subsequent correction is such that the overall conclusions of the original report remain unchanged.

What do the model results mean?

The model results showed us that pumping groundwater at 2018 volumes or at permitted volumes reduces base flow by 20 percent or more. This reduction in base flow is negatively impacting the creek.

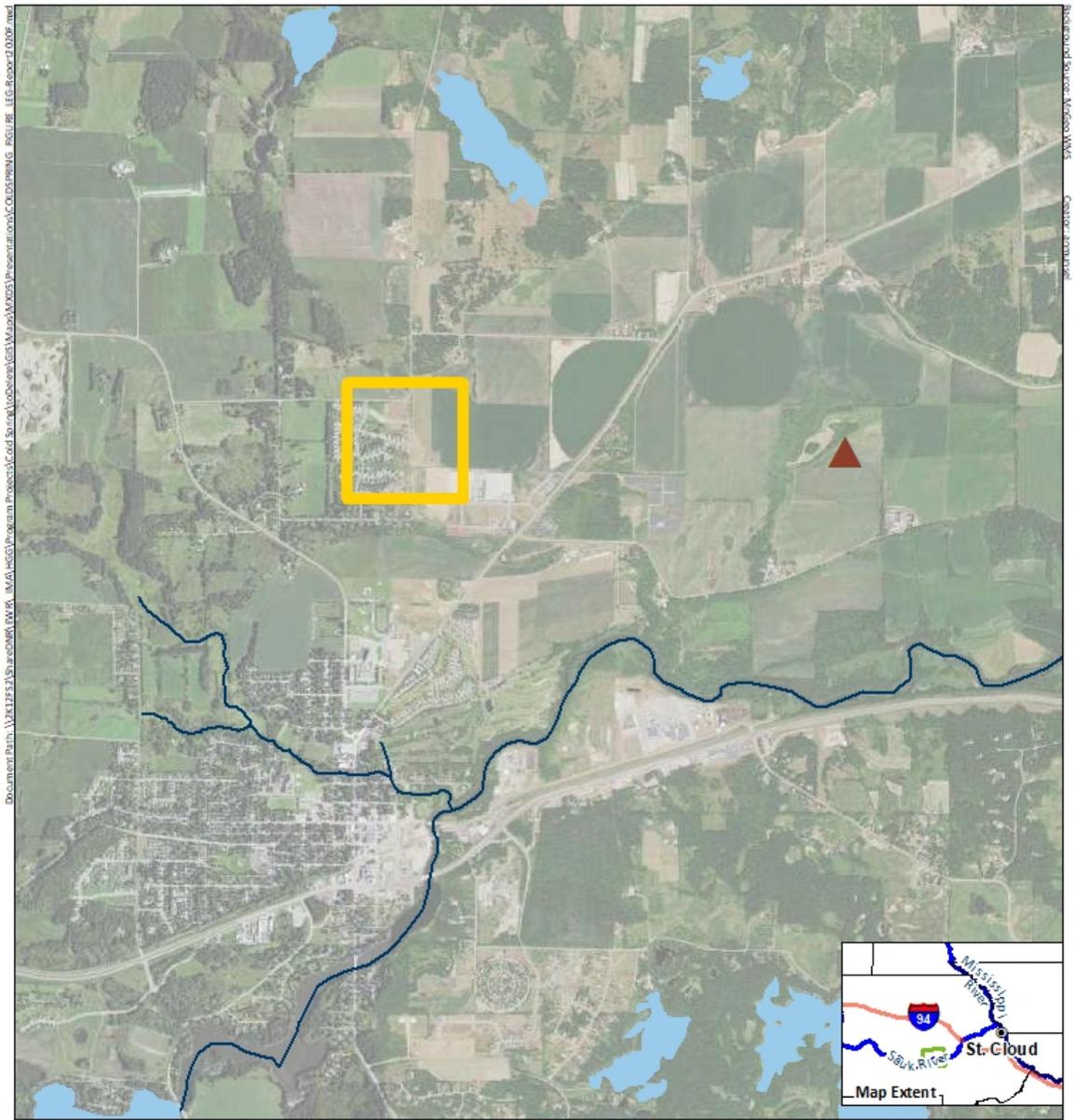
We also learned that pumping very close to Cold Spring Creek strongly impacts flow in Cold Spring Creek, but pumping farther from Cold Spring Creek has much less impact. The model results show that it is possible for groundwater users to meet their current and future needs while also protecting the ecosystem by strategically managing existing appropriations near Cold Spring Creek and locating new wells farther from Cold Spring Creek.

Permit Revision

The City submitted a permit amendment application in October 2020. The amendment request was for adding three new wells (which would be #s 7, 8, and 9) to the permit (1976-3179) and for increasing the total volume of the permit to 750 million gallons per year (MGY). The amendment was intended to supply future water use for the City and CSBC after CSBC's permit 1984-3211 expired at the end of calendar year 2021. Due to unforeseen issues experienced with the City's new wells, the City and CSBC are asking the DNR to extend permit 1984-3211 for a maximum of 6 months while the City builds a new water tower. To avoid increased impact, while the CSBC wells are still pumping near the stream, the City was asked to revise the amendment request to 605 MGY. The amendment for 605 MGY was issued on November 5, 2021. Once the water tower is put in place and the CSBC permit has expired, the City may then request another amendment for the full 750 MGY. The amendment includes pumping some groundwater from the City's new wellfield (Lot 1/Block 1, farther from Cold Spring Creek) and continuing to pump some groundwater at the City's existing wellfield. Current City Well 3, near Cold Spring Creek, was dropped from use under the amendment. The City initiated discontinuation of City Well 3 in the fall of 2020.

Once CSBC permit 1984-3211 expires, only 20 MGY will be pumped near the stream, under CSBC permit 1988-3220. By reducing groundwater use near the creek, the proposed use appears likely to meet industry and municipal needs while avoiding negative impacts to the creek.

The DNR also evaluated the City's amendment request to determine if domestic wells are at risk of going out of water as a result of groundwater pumping from new wells or an increased authorized volume. The DNR determined that with some adjustments, including lowering the pumps at several wells, domestic well interference could be avoided, and industry and municipal needs could be met at proposed pumping volumes.



Legend

-  Lot 1/Block 1
-  City of Cold Spring Wellfield

Wellfields used scenarios 6-12

Report to the Legislature 2021

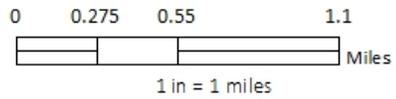


Figure 1. Map showing location of City’s current wellfield and the Lot 1/Block 1 site relative to Cold Spring Creek