

# COLD SPRING AREA GROUNDWATER MODELING PROJECT: an Overview

## THE PROBLEMS

Currently, the use of groundwater in the Cold Spring Area is not sustainable. There is clear evidence that flow of groundwater into Cold Spring Creek is being reduced by the pumping of groundwater by Cold Spring Brewery and other users in the area. The reduced flow of groundwater into the creek is resulting in decreased streamflow. These conditions negatively impact fish and other wildlife in the stream. In 2012, the Minnesota Department of Natural Resources (DNR) informed the city of Cold Spring and a major groundwater user, the Cold Spring Brewery, that groundwater use in the area must be adjusted in order to return to sustainable use levels.

In addition, nitrate contamination in the area's groundwater is a significant challenge facing the city Cold Spring's public water supply.

## THE RESPONSES

It is widely recognized the importance and value of local businesses to communities such as Cold Spring and the difficult challenges of finding alternative water sources. That is why the city of Cold Spring, local businesses, the DNR, other state agencies, and local legislators are working together to address the problems. The city of Cold Spring is working to locate a new source of water for the city. The brewery and the DNR are working together to allow the company to use existing sources of groundwater, while the City and Brewery search for new sources. The Legislature provided funding to develop a groundwater model to determine the amount of water that can be sustainably pumped from the area.

## THIS OVERVIEW

This overview focuses on the DNR groundwater modeling project. The project will help clarify connections between groundwater and surface water in the area, and the impacts of individual and cumulative groundwater use on Cold Spring Creek.

The project will generate two sets of groundwater model simulations: an initial model simulation using existing data and a second model simulation using three years of additional data to improve model precision. The first model simulation will be completed by the end of 2017. The second model simulation will be completed by the end of 2021.

## OTHER EFFORTS

There are several other important efforts underway to ensure groundwater use in the area returns to sustainable levels:

1. Cold Spring Brewery, the City and the DNR jointly adopted a "Progress Plan" in 2014 that outlines efforts to locate a new source of groundwater to meet the needs of the City and Brewery, while not impacting the stream. The plan is in response to a special condition on its limited groundwater permit.
2. The city of Cold Spring is trying to locate new sources of groundwater for its public water supply, in order to help meet Cold Spring Brewery's water supply needs, potential

increased water needs (both public and businesses), and ongoing nitrate contamination in current City wells. (Note: the DNR groundwater model will not address the contamination issues facing the city. We recommend the city work with the Department of Health to address these issues.)

3. The DNR will be setting a “protected flow” for Cold Spring Creek that it will use to determine a sustainable diversion limit for the stream and to regulate groundwater permits in the area.

## THE GROUNDWATER MODELING PROJECT

The Minnesota Legislature mandated that the DNR “...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.”

The DNR has created the Cold Spring Area Groundwater Modeling Project to implement this mandate. The Project will take five years to complete.

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As directed by the legislature, the DNR will be providing annual progress reports beginning July 1, 2017. A final report is due no later than January 15, 2022.

## PUBLIC PARTICIPATION – STAKEHOLDER ENGAGEMENT

The DNR wants effective public participation and stakeholder engagement during this project. The DNR will be forming an advisory group to ensure we are using state-of-the-art modeling approaches and incorporating important stakeholder perspectives in the project. The advisory group meetings will be open to the public to enhance participation and engagement.

The DNR will ask technical experts from the US Geological Survey, Minnesota Geological Survey, Minnesota Department of Health, private consulting firms, as well as representatives from the city, the brewery, and other organizations to join the advisory group. The DNR will create and use a project website and a project email address for public comments, use GovDelivery to distribute project updates, and deliver the required progress reports to the Legislature. The DNR may host other public meetings or engagement activities as the project unfolds.

## THE STEPS IN THE PROJECT

The DNR anticipates that there will be six steps in this multi-year project. Throughout the project, the DNR will update its website, distribute project updates, respond to public comments, and provide progress reports to the Legislature.

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|---|-------------|
| Step 1 – Define the study area; engage technical experts and advisors   | [2016-2017] |
| <ul style="list-style-type: none"> <li>• analyze watershed, geology, and groundwater boundaries</li> <li>• create and meet with technical advisory group</li> </ul> |             |
| Step 2 – Review existing data and identify gaps   | [2017]      |
| <ul style="list-style-type: none"> <li>• compile existing data</li> <li>• analyze key data deficiencies</li> </ul>  |             |

**Step 3 – Produce the initial groundwater model simulation**

[2017]

- review previous models and modeling approaches
- select a model to use as the starting point for DNR’s modeling efforts
- define modeling goals and objectives (e.g., clarify groundwater user impacts on the stream)
- use existing data to simulate groundwater and surface water connections and interactions
- share simulation results with technical advisory group, key stakeholders, DNR permit decision makers

**Step 4 – Enhance the initial model simulations**

[2018-2020]

- collect new data on groundwater, surface water, and use patterns
- use new data to improve the precision of the initial model
- evaluate the enhanced model’s fit and precision
- meet with technical advisory group to discuss the enhanced model

**Step 5 – Run predictive simulations to inform decisions**

[2020-2021]

- use the enhanced model in predictive simulations and decision scenarios
- evaluate how well the model provides decision-relevant information
- discuss with decision makers, technical advisors, and stakeholders the results of the simulations

**Step 6 – Deliver a final report to legislators and stakeholders**

[late 2021]

- meet with technical advisory group to review a draft final report
- deliver final report to legislature
- implement stakeholder engagement activities to highlight the final report

**STUDY SUCCESS – SUSTAINABLE USE**

The Cold Spring Area Groundwater Modeling Project will be considered a success if the information it generates helps state and local decision makers ensure that groundwater use is sustainable in the Cold Spring Area.

Groundwater use will be sustainable in the Cold Spring Area if it does not harm aquifers, does not negatively impact surface waters, does not degrade water quality, is used efficiently, is used legally, and remains available for future generations.

Minnesotans value their groundwater and surface water resources. Water is vital to our economy, our environment, and our identity. By working together, Minnesotans can develop better information, use it in management decisions, and enjoy sustainable groundwater resources now and into the future.

The Cold Spring Area Groundwater Modeling Project is an example of Minnesota’s commitment to water resources, economic prosperity, and sustainability.