

Summary – Hamilton County Groundwater Sustainability Study

The **Upper Big Blue Natural Resources District (UBBNRD)**, working with the **Aurora, Nebraska** city government and **Hamilton County, Nebraska**, conducted a study to evaluate the **long-term sustainability of groundwater** in the Aurora area. Groundwater is the region’s main water source for domestic, municipal, industrial, and especially agricultural irrigation uses. The study was motivated by expected **future municipal growth and potential large industrial water users**.

Aurora currently operates **seven municipal wells**, producing about **1,000 acre-feet (≈330 million gallons) of water per year**, and demand has been **increasing by about 10.5 acre-feet annually** over the past 20 years. Recent water use is approaching the city’s historic peak, and a single large industrial facility could potentially use **as much or more water than the city itself**.

To evaluate future supply, consultants from **HDR, Inc.** developed a **localized groundwater model** based on the regional **Blue River Basin Groundwater Model**. The model simulates groundwater conditions from **1940–2074** and tests different water-use scenarios. Sustainability is measured against a regulatory benchmark: groundwater levels must **not drop below the April 1978 water-table level**, which serves as the management trigger.

The study modeled **three baseline conditions and three development scenarios** to assess municipal growth and potential industrial pumping.

Key Findings

- **Aurora’s municipal water demand can likely be met through at least 2075** using local groundwater resources.
- Even with projected growth, **water levels generally remain above the 1978 trigger level**, though some wells may briefly reach it during drought periods.
- **Additional groundwater is available for new industrial users** and for development in surrounding townships.
- Wells **southeast of Aurora** tend to perform better and produce more water than those northwest of the city due to higher groundwater levels.
- Some potential well sites already approach the trigger level even without additional pumping.

Water Quality

Groundwater in the area has an **average nitrate concentration of about 7.1 ppm**, placing it within a **Phase II Groundwater Quality Management Zone**, indicating **existing nitrate contamination** that should be considered when developing new wells.

Overall conclusion: The region has sufficient groundwater to support **future municipal growth and potential industrial development**, but **careful management and monitoring—especially of water levels and nitrate contamination—will be important for long-term sustainability.**