Groundwater Sustainability Modeling in the Cambrian-Ordovician Aquifer

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“The Cambrian and Ordovician sandstones...are hundreds of feet thick in the aggregate and underlie thousands of square miles: There are...vast volumes of water stored in the Prairie du Chien and other limestones belonging to the same artesian system. It is assumed that this reservoir...is practically inexhaustible.”

- 1927 Iowa Geological Survey Annual Report (p.72)
The Cambrian-Ordovician (Jordan) aquifer is one of Iowa’s most productive and relied upon aquifers.
Water levels in the aquifer have been declining in certain areas over the past several decades.
New regulations were introduced in 2014 to reflect improved science and better manage the aquifer.

<table>
<thead>
<tr>
<th>Tier 1</th>
<th>Declines from 1978 Potentiometric Surface</th>
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<tbody>
<tr>
<td>&lt; 300 feet</td>
<td>&lt; 50%</td>
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<table>
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<tr>
<th>Tier 2</th>
<th>300 – 400 feet</th>
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<tr>
<td>&lt; 50% - 75%</td>
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<table>
<thead>
<tr>
<th>Tier 3</th>
<th>&gt; 400 feet</th>
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<tbody>
<tr>
<td>&gt; 75%</td>
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*Dependent on whether top of aquifer is greater or less than 600 feet from 1978 surface (Horick and Steinhilber, 1978)
New regulations also identified two protected water source areas.
The IGS began a multi-year groundwater modeling project to develop a tool for long-term aquifer management.
The project was a *collaborative* effort between individual water users, the DNR, and the IGS.
A statewide CO aquifer model was adapted to evaluate areas of interest and local wellfields.
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Collect Local Aquifer Information

- Historic Water Levels
- Pump Tests
The model was calibrated to (1) static water level time series and (2) pump test drawdowns.

Static Water Levels

Drawdown

2000 - Current
Regionally, the model provides regulators with a tool for long-term management.

Linn and Johnson Counties

Current

Allocated

Most Likely
City of North Liberty

“The model has allowed the city to maximize water production while minimizing the impact on the aquifer. It’s been a win-win for the city and the other area water users.” – Greg Metternich, North Liberty Water Manager
City of Fort Dodge

- Additional wells and a significant increase in water usage for the new industrial park.
The regional groundwater model is being successfully applied to local water use and management evaluations.

Thanks for listening!

Any questions?