Groundwater Data and Irrigated Agriculture

Wisconsin Land + Water
November 10, 2016

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Waukesha, Wisconsin

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Wisconsin Potato and Vegetable Growers Association (WPVGA) - Good Stewards of the Environment

WPVGA members are committed to continuous improvements in agricultural environmental stewardship.

- The Water Task Force – Water Conservation in the Central Sands Region
- WPVGA Funding for Water Research
- WPVGA Partnership With the World Wildlife Fund and Environmental Awards
- WPVGA and the Little Plover River Conservancy

See Fact Book, Tab R
Agriculture in Wisconsin: DATCP

• Contributes $90B to Economy
• Provides Employment for 827,000 People
• Each Job Supports 1.4 Indirect Positions
• Wisconsin Ranked Third In Potato Production and Processed Vegetables
• Much Success Attributable to Central Sands
The Water Task Force – Water Conservation in the Central Sands Region

The WPVGA sees water as its most precious resource.

Water use is a critical issue in central Wisconsin, and the WPVGA and its grower members are committed to the judicious use of this most precious resource.

The WPVGA formed the Water Task Force to find solutions to water issues.

The Water Task Force was formed to develop and promote responsible water use practices that will protect the groundwater aquifer of the Central Sands and its associated streams, lakes and wetlands in ways that will ensure a sustainable agricultural industry for future generations, foster vibrant rural communities and respect the needs of all its citizens.
WPVGA Funding for Applied Research

The WPVGA Water Task Force has funded a program to measure groundwater depths in privately owned irrigation wells across space and time; they have purchased and installed equipment to continuously monitor groundwater in four areas designated as high risk for surface water impacts; and they continue to fund and collect data from over 25 monitoring wells in Central Wisconsin in cooperation with the Wisconsin Institute for Sustainable Agriculture.

In irrigation technology, they have funded, developed and implemented new irrigation scheduling software to match water use to crop need; conducted on-farm research with drip irrigation, deficit irrigation and precision irrigation; and in water loss, they have conducted field research on year-round evaporation from crops and natural vegetation and developed digital maps of all vegetation types in Central Sands watersheds to aid in designing landscapes that require less water and increase recharge.
WPVGA Has Received Numerous Awards for Environmental Stewardship

Wisconsin farmers are considered the nation’s leaders in environmental stewardship.

Wisconsin’s potato and vegetable growers achieved the World Wildlife Fund’s “Gift to the Earth” award in 1998. This prestigious award recognizes extraordinary efforts to protect the world’s most outstanding wildlife and wild places. The WPVGA received this award based on its unique collaboration between environmentalists and farmers designed to protect human health and improve wildlife habitat through the formation of the Healthy Grown program.

In 2003, the unique partnership between the World Wildlife Fund, Wisconsin potato growers and university researchers was recognized as a recipient of the USDA’s prestigious “Secretary’s Honor Award,” for maintaining and enhancing the nation’s natural resources and environment.

The WPVGA has also received the “Good Egg Award” from the International Crane Foundation, the International IPM Award of Achievement, as well as recognition from the environmental group, Defenders of Wildlife.
WPVGA Work in Progress

- Static Water Level Measurements
- LPR Instrumentation Study
- Seepage lake sensitivity analysis
- Modeling opportunities for Langlade County and Central Sands
Area of Interest

SWL Measurement Locations
### WELL CONSTRUCTOR'S REPORT

**DEPARTMENT OF RESOURCE DEVELOPMENT**

1. **COUNTY**
   - Portage

2. **OWNER**
   - Roland Kendall

3. **OWNERS COMPLETE MAIL ADDRESS**
   - Almond, Wisconsin 54911

4. **WELL**
   - Perm. Well # 23892

5. **Distance in feet from well to nearest: (Record answer in appropriate block)**
   - Building
     - 600 feet
   - Drain
     - 600 feet
   - Sewer
     - 300 feet
   - Abandoned Well
     - 300 feet
   - Sink Hole
     - 300 feet

6. **Well is intended to supply water for:**
   - Irrigation only

7. **DRILL HOLE**

<table>
<thead>
<tr>
<th>Dia. (ft)</th>
<th>From (ft)</th>
<th>To (ft)</th>
<th>Dia. (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>144 3/4</td>
<td>2</td>
<td>163 3/4</td>
<td></td>
</tr>
</tbody>
</table>

8. **CASING, LINER, CURBING, AND SCREEN**

<table>
<thead>
<tr>
<th>Dia. (in)</th>
<th>From (ft)</th>
<th>To (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 ga.</td>
<td>Steel Plain</td>
<td>91</td>
</tr>
<tr>
<td>10 ga.</td>
<td>Steel screen</td>
<td>91</td>
</tr>
</tbody>
</table>

9. **GROUT OR OTHER SEALING MATERIAL**

<table>
<thead>
<tr>
<th>Kind</th>
<th>From (ft)</th>
<th>To (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay cuttings</td>
<td>Surface</td>
<td>70</td>
</tr>
</tbody>
</table>

10. **WELLPACK**

    | Depth (ft) |
    |-----------|
    | 70 |

11. **YIELD TEST**

    | Yield (gpm) |
    | 1000 |

12. **WELL CONSTRUCTION COMPLETED ON**

    | October 12 |

13. **WELL IS TERMINATED**

    | 16 inches |

14. **WELL DISINFECTED UPON COMPLETION**

    | Yes |

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**PORTAGE Co. TRIG. # 218**

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**10. FORMATIONS**

<table>
<thead>
<tr>
<th>Kind</th>
<th>From (ft)</th>
<th>To (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay</td>
<td>Surface</td>
<td>5</td>
</tr>
<tr>
<td>Sand &amp; gravel</td>
<td>5</td>
<td>35</td>
</tr>
<tr>
<td>Clay</td>
<td>35</td>
<td>40</td>
</tr>
<tr>
<td>Gravel &amp; sand</td>
<td>40</td>
<td>90</td>
</tr>
<tr>
<td>Sand</td>
<td>90</td>
<td>95</td>
</tr>
<tr>
<td>Sand gravel</td>
<td>95</td>
<td>130</td>
</tr>
<tr>
<td>Clay</td>
<td>130</td>
<td>150</td>
</tr>
<tr>
<td>Gravel, course sand</td>
<td>150</td>
<td>163</td>
</tr>
</tbody>
</table>

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**93 ft.**
W Rendall Well

Date
10/14/09 2/26/11 7/10/12 11/22/13 4/6/15 8/18/16

Depth To Water
89
90
91
92
93
94
95
Nohr Co Rd A Well

Date

Depth To Water

10/14/09  2/26/11  7/10/12  11/22/13  4/6/15  8/18/16

72
73
74
75
76
77
78
WPVGA and the Little Plover River Conservancy

- WPVGA will work with the Village of Plover, the community and the DNR to create a conservancy.
- Will help revitalize the river by increasing stream flows, improving stream quality, improving visibility and use of the LPR by the general public.
- Increase wetland areas; restore shorelines; add nature trails to connect with the Green Circle Trail; create kiosks and signage within pavilions and along park trails.
- Educate the public about Wisconsin agriculture, natural resources and our commitment to the environment and water conservation technology.

LPR Model Should be Used to Evaluate Various Optimization Scenarios
WPVGA growers are committed to a science-based approach to water policy based on verified evidence to guide and inform water use decisions.

- Historic Static Water Level Data
- The Impact of Irrigated Agriculture on Streamflow as Compared to Other Alternative Landscape Uses
- The Impact of Climate in the Great Lakes Region
The Impact of Irrigated Agriculture on Streamflow as Compared to Other Alternative Landscape Uses

Recharge = Precipitation
+ Applied Irrigation
- Actual Evapotranspiration
+ Change in Soil Water Storage
- Runoff

See Fact Book, Tab G – Freihofer, Adam, Estimating Groundwater Recharge in the Central Sands
Irrigated Agriculture Improves Recharge vs. Other Landscape Usage

See Fact Book, Tab J
The Impact of Climate in the Great Lakes Region

- Lake levels appear to be impacted by broader climate changes.
  - Lake levels Influenced by Climatic Changes
  - Long-Term Variations (1951-2014) Studied by WDNR
  - Supplemental information provided in Tab P.

- WPVGA and Central Sands Water Action Coalition
  - Two initial meetings
  - Shared goal of developing a local solution

- Seeking continuous improvement to science-based approaches to water policy and water use decisions
Impacts of Afforestation / Wisconsin’s Reforestation Programs

• Studies in different geographical areas (U.K. and Northern Wisconsin) have shown water use by trees on an annual basis that exceeds the amount used to grow potatoes.

• Wisconsin has more forested land now than it has since the Forest Service forest inventory in 1936.

• Evapotranspiration by trees is shown in a number of studies to be greater than that of grass, crops or vegetables.

• Agricultural water use may not be either the sole or major source of groundwater depletion and reduced streamflow in Wisconsin over the past 50 years.

See Fact Book, Tab M
Thank You!

Questions and Open Discussion

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