

## Monitoring wells installation update

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**Introduction:** Irrigators have organized the collection groundwater elevation measurements in an unspecified number of high-cap wells four times per year, in addition to providing submersible pressure transducers to be installed in monitoring wells. This is an update on the installation groundwater elevation monitoring equipment. As to date, fourteen of thirty-five pressure transducers have been installed.

**Equipment:** A total of thirty-five continuous monitoring groundwater wells were purchased in April 2012. Each set has the ability to log pressure readings at programmable time intervals. Each set came with three components: a *Process Measurement & Control, Inc.*<sup>1\*</sup> VL4353 vented pressure transducer to measure groundwater head, an *Omega* OM-EL-USB4 data logger and a AC to DC converter. As the instruments are deployed locations without an AC power source, a secondary power source was purchased and retrofitted onto the instrument cluster. The secondary power source includes a *QuickCable* solar powered 12-volt trickle charger and a *Werker* WKA12-8F 12V 8Ah battery. The pressure transducer accepts a supply voltage between ten and thirty-five volts DC, has an output voltage between four and twenty mA DC. The output mA signal corresponds linearly with potential head of zero to twenty feet of water and has an accuracy of  $\pm 0.25\%$  best straight line. The data logger storage capacity is approximately 32,000 readings which translate to over three years of storage of one reading per hour. Well casing were also purchased. The plastic well casings are *Campbell Monoflex* schedule 40 1 1/4 inch diameter in ten and five foot sections and matching five foot screens with the potential to install thirty-five monitoring wells with an average depth of forty feet.

**Areas of interest:** Four areas of interest were selected. Three areas are near a stressed body of surface water in areas dominated by irrigated agriculture, including Pleasant Lake near Coloma, Long Lake near Plainfield and the Little Plover River in Plover. The area around Stoltenberg

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<sup>1</sup> Mention of brand names is not an endorsement by the University of Wisconsin

Creek near Amherst was selected for being an in Central Wisconsin that has limited but the potential for increase in irrigated acres.

**Installation:** The installation process has several steps. Once an area of interest is selected, landowners are identified. The land owner is then contacted and asked to participate in the project. Pending permission from the land owner, new monitoring wells must go through a vetting and permitting process outline in the Department of Natural Resources chapter NR141 groundwater monitoring well requirements. At which point the groundwater monitoring wells can be dug and installed. In 2012, records of previously installed monitoring wells installed throughout Central Wisconsin were consulted, partly through discovery while making visits to potential field sites and partly through communication with Wisconsin Department of Natural Resources (WDNR), Wisconsin Natural History and Geological Survey (WNHGS) and United States Geological Survey (USGS) staff. Initial review of monitoring well records available on line through the USGS and Wisconsin Department of Transportation's websites indicated the potential to use previously installed wells. In 2012, the location of monitoring wells was verified by in person visits to sites. The majority of monitoring wells on records were not found, most likely removed at the end of each respective study. The monitoring equipment currently installed was installed in existing monitoring well casings around Long Lake, near Coloma and near the Little Plover River. Locations of each monitoring well will be presented below.

**Forward in 2013:** Installation plans continue into 2013 with three focus areas. A study has been announced by WDNR and USGS to develop a more detailed model of the Little Plover River hydrogeology. Plans to install monitoring wells near the Little Plover River have been delayed in order to coordinate and support the new study. Installation of monitoring wells in an east-west linear transect from Pleasant Lake west over the water shed divide has also been planned. Additional wells will be place to assist in evaluating drainage, ground cover and other management factors.



Figure 1. Aerial map of monitoring wells installed around a pivot near Coloma Wisconsin.



Figure 2. Aerial map of monitoring wells installed around Long Lake, Hancock Wisconsin.



Figure 3. Aerial map of monitoring wells installed around a pivot near Little Plover River, Plover Wisconsin.

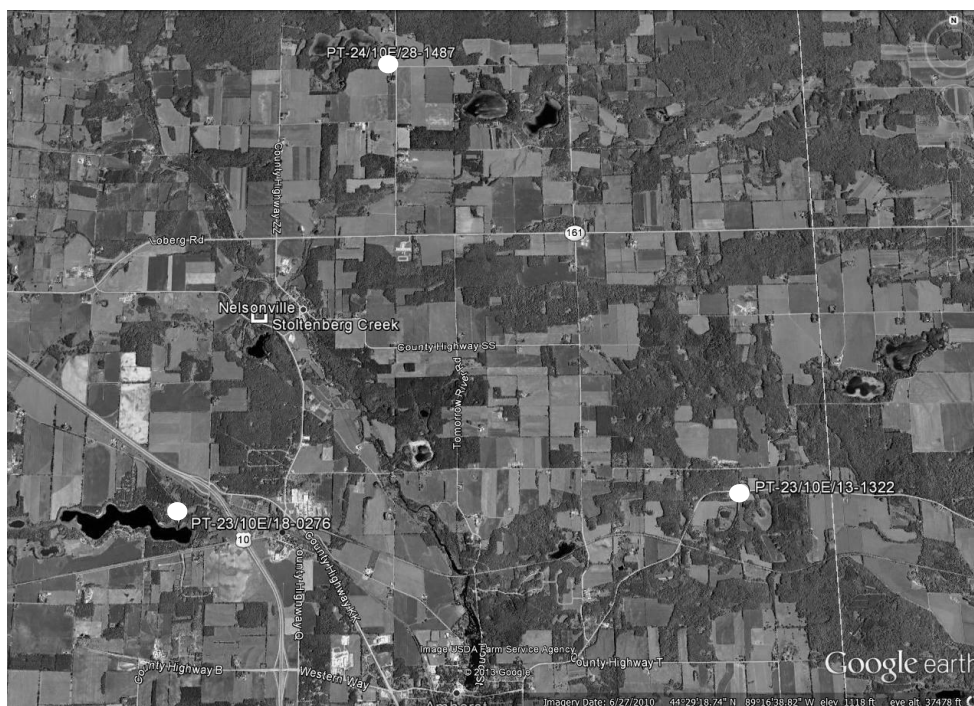


Figure 4. Aerial map of showing USGS monitoring wells installed near Stoltenberg Creek, Amherst Wisconsin.