

Appendix A

Deviations from the Work Plan, Fieldwork Duration and Personnel, and Well Modification Memo

1.0 Fieldwork Deviations from the Work Plan

All fieldwork was conducted in accordance with the Groundwater Assessment Work Plan (Barr, 2008), except for the deviations listed below:

Field Work Category	Description of Deviation	Rationale for Deviation	Result
Pumping Well and Aquifer Test	One pumping well was installed rather than three	Significant thicknesses of diamicton till were encountered at two of the proposed pumping well locations.	One aquifer test was conducted, on a 6-inch-diameter pumping well with two observation wells. Test results provided valid estimation of the hydraulic conductivity of the outwash.
Monitoring Well Locations	Wells were installed in locations different than the planned locations.	The location of certain monitoring wells was adjusted from the work plan based on site conditions and subsurface findings during the investigation.	An effective monitoring well network was established across the UMA and UMore Park.
Well Development	Polymeric dispersant (NW-220) was used to break up drilling fluids during well development.	Pumping/surging and airlifting alone were not effective at clearing drilling mud from both the pumping well and the monitoring wells.	Both pumping and monitoring wells are sufficiently developed for future monitoring purposes.
Water Level Monitoring	Water levels are measured once to twice per month rather than semimonthly.	Measuring water levels in wells once to twice per month is sufficient to assess water level fluctuations.	Hydrographs for the monitoring network illustrate low variation of water levels during the course of the Assessment.

2.0 Fieldwork Duration and Personnel

All fieldwork was conducted by Barr personnel or by Barr's subcontractor under Barr's supervision. Dates during which fieldwork was conducted and the subcontractors who conducted fieldwork are listed below:

Task	Dates Conducted	Team or Subcontractor
Well Installation	12/20/2008 to 1/30/2009	Traut
Soil Sampling	12/20/2008 to 1/30/2009	-Collected by Barr -Analyzed by Soil Engineering Testing, Inc
Development by Pumping/Surging	1/21/2009 to 2/4/2009	Traut
Development by Surging with Dispersant and Pumping	2/17/2009 to 3/10/2009	Traut
Aquifer Testing	2/18/2009 to 2/20/2009	Traut
Modification of Existing Well	3/5/2009 to 3/6/2009	Traut
Surveying	1/17/2009 to 3/20/2009	Barr
Groundwater Sampling	2/9/2009 to 2/13/2009 4/6/2009 to 4/10/2009	-Collected by Barr -Analyzed by Legend Technical Services, Inc
Groundwater Elevation Monitoring	1/16/2009 1/30/2009 2/19/2009 3/3/2009 4/3/2009 4/22/2009	Barr



Memorandum

To: File
From: Jim Eidem
Subject: Well Modification Work, UMA Groundwater Assessment
Date: March 6, 2009
Project: 23/19-0B05.03

This memorandum provides a summary of the well modification work performed at the UMore Park site on March 5 & 6, 2009.

BACKGROUND

Barr's initial plan for the Groundwater Assessment was to utilize existing water supply wells at the site to measure water levels in the Prairie du Chien (PDC). The work plan identified a number of possible wells that could be used. Barr inspected the identified water supply wells with the contractor's (Traut) pump crew and determined that the identified wells in the central and western portions of the site were not useable in their current conditions (due to the well head configurations and pitless adaptor obstructions).

Based on the well inspection results, Barr contracted Traut to modify the well head configurations of the three water supply wells listed below:

Unique Well ID	Location	Comment
185278	Site grid space E1; SW corner of site	10" diameter irrigation well completed in the PDC.
207607	Site grid space D2: Central Services Complex	4" diameter irrigation/supply well likely completed in the PDC.
207616	Site grid space B2: Poultry Research Farm	4" diameter irrigation/supply well completed in St. Peter/PDC.

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The well modification work entailed:

1. Acquiring permits (if required);
2. Mobilizing/Demobilizing crew, rig, equipment, & supplies to site;
3. Inspect each well with Barr prior to modification work; and
4. At each well: Turn off electrical supply, disassemble well head, lift pump as needed, install drop pipe, provide access port in well cap, reassemble well head, verify pump operation, and disinfect well per Well Code.

RESULTS

The results of the modification work are summarized below:

Unique Well ID	Inspection Findings	Results/Comments
185278	Well is suitable for modification.	Installed 1.25" diameter drop pipe as planned; drop pipe is approximately 105' long with holes drilled in the bottom 40' feet; disinfected well and re-set pump but did not verify operation due to frozen water in well drop pipe (Notified Jim Rowe, U of M).
207607	Well appeared suitable for modification.	Lifted pump assembly; pitless adaptor did not allow for drop pipe installation; re-set pump and verified operation.
207616	Well not suitable for modification.	Pump discharge pipe did not allow for drop pipe installation; did not pull pump.

Unique well #185278 will be used during future water level monitoring events.