

From: Ryan Nehls <rnehls@reaeng.com>
Sent: Friday, June 24, 2022 11:41 AM
To: Koepke, Cynthia L - DNR
Cc: Bill Buckingham; Brian Flad
Subject: Shorewood Commons BRRTS #02-13-560698
Attachments: HydroGraph.pdf; Well Screen & Water Levels.pdf; Site Map.pdf

Follow Up Flag: Follow up
Due By: Thursday, July 28, 2022 8:00 AM
Flag Status: Flagged

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Hi Cindy,

I wanted to give you an update on the Shorewood Commons site and get you some responses to your email to Bill sent February 18.

We measured groundwater levels on 1/18/22 and 5/20/22. In January, it appeared the water level was equalizing a bit in our new MW-5 but unfortunately the water level rose 5' in May (while other wells dropped ~12"). I put together some hydrographs and responses to your comments from your 2/18/22 email can be found in red below:

1. Prepare a hydrograph covering at least the last 5 years and see if the wells are responding in a similar fashion. This is a good way to see if it's only a few wells that are "behaving" differently.
See attached Hydrograph, seems our new PZ-3 is back in line but MW-5 is still out there.
2. Some cross-sections and a chart showing the well screen depths can help show if the wells might be in different units with different hydraulic conductivities or with the screen submerged etc.
See attached Well Screen & Water Levels. The wells are ordered in what is assumed upgradient to downgradient. We're below the screens on MW-1R and MW-4.
3. Did you check if the reference elevation point out there may have settled or changed in some way? When you resurveyed, if the reference elevation has changed, you may need to correct some readings...proceed with caution as it could be tricky to figure out which readings should be referenced to the old datum vs the new one.
We re-checked our bench mark (concrete ledge) and appears to be unchanged.
4. I haven't been out to look at the wells, but I am assuming many (or all?) are flush mounts. If flush mounts are screened in a low K unit, then they could be affected by

atmospheric pressure and may need to sit a while after being opened before you measure the water level.

We left them open on 5/20/22 prior to measuring and will continue to do so in the future.

5. And speaking of K, have you done hydraulic conductivity testing? It's a requirement in NR 716.

We did a falling slug test in MW-5 on 5/20/22 but got incomplete data as after 4 hours our water level was still a foot short from original. I passed the data to our hydrogeologist and we're waiting for a K value. I'll get that to you ASAP but safe to assume it's a low K. We wanted to run the test south of Locust but unfortunately MW-3 is dry.

6. Do you regularly measure the depth to the bottom of the well? It's possible there is an issue with some well screens being silted up, damaged, etc.

We will add that measurement to our routine in the future, but we typically have a couple inches of silt in the bottom.

We will keep monitoring the water levels, but MW-5 continues to be an anomaly. I do know that bailing that well, the water level falls quickly and is slow to recover which would be consistent with a low K. Let me know if you have any thoughts.

Thanks,

Ryan Nehls, E.I.T.
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Well	MW-1R	MW-2	MW-3	MW-4	MW-5	MW-9	PZ-1	PZ-2	PZ-3	PZ-4
Top of Casing El.	882.50	880.47	881.16	879.36	881.59	880.73	881.33	879.53	881.58	880.51

Depth to Water
Date

11/6/2017	14.95	13.78	14.91	14.50	n/a	13.38	15.02	14.80	n/a	12.79
11/14/2017	15.01	13.42	14.58	14.55	n/a	13.08	14.72	14.57	n/a	12.68
3/15/2018	16.57	14.60	15.84	14.43	n/a	14.69	15.91	14.74	n/a	14.27
9/26/2018	15.39	14.29	15.30	8.03	n/a	13.45	15.72	10.63	n/a	13.02
10/26/2020	19.02	17.61	18.71	16.40	n/a	17.05	19.03	16.86	n/a	16.65
9/16/2021	n/a	22.57	23.66	17.25	14.73	21.85	23.90	21.45	23.61	21.47
11/16/2021	n/a	23.04	24.11	n/a	14.79	22.46	24.39	22.26	14.40	22.10
1/18/2022	n/a	23.75	25.02	n/a	18.06	23.40	25.12	23.19	25.37	23.04
5/20/2022	n/a	24.84	26.15	n/a	13.07	24.57	26.41	21.60	26.10	24.21

Water Elevation
Date

11/6/2017	867.55	866.69	866.25	864.86		867.35	866.31	864.73		867.72
11/14/2017	867.49	867.05	866.58	864.81		867.65	866.61	864.96		867.83
3/15/2018	865.93	865.87	865.32	864.93		866.04	865.42	864.79		866.24
9/26/2018	867.11	866.18	865.86	871.33		867.28	865.61	868.90		867.49
10/26/2020	863.48	862.86	862.45	862.96		863.68	862.30	862.67		863.86
9/16/2021		857.90	857.50	862.11	866.86	858.88	857.43	858.08	857.97	859.04
11/16/2021		857.43	857.05		866.80	858.27	856.94	857.27	867.18	858.41
1/18/2022		856.72	856.14		863.53	857.33	856.21	856.34	856.21	857.47
5/20/2022		855.63	855.01		868.52	856.16	854.92	857.93	855.48	856.30

HYDROGRAPH





LEGEND

- MW-1 Existing Monitoring Well
- PZ-1 Existing Piezometer
- Property Boundary

DRY

- MW-4
- PZ-2

REVISIONS:

DATE

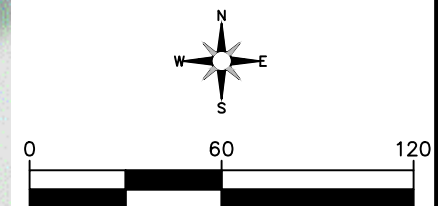
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GROUNDWATER ELEVATION MAP (5/20/22)
 PHASE II INVESTIGATION
 SHOREWOOD COMMONS
 3330 UNIVERSITY AVENUE
 SHOREWOOD, WI 53705

DATE: JAN, 2022
DRAWN: RAN
CHECKED: WWB
APPROVED: WWB
DRAWING NAME: 1358figures.dwg
PROJECT NUMBER: 130058.1

FIGURE 2.1



Well Screens & Water Elevation

Well Screen Water Elevation (1/18/22) Water Elevation (5/20/22)

