memo

Project Name |	Groundwater Elevations	**Date** |	01/05/2016
To / Contact info |	BCWD Board of Managers		
Cc / Contact info |	Karen Kill, District Administrator		
From / Contact info |	Stu Grubb, PG		
Regarding |	2015 Trends		

Background

EOR has measured groundwater elevations in wells in BCWD since 2012. DNR also measures groundwater elevations in three observation wells. The measurements help identify trends in groundwater elevations that relate to groundwater/surface water interactions in Brown's Creek and other groundwater-dependent natural resources.

Analysis

Residential Wells

Groundwater elevation data from the residential wells (and DNR observation wells) are shown on Table 1. Groundwater elevations generally decreased from 2014 to 2015 by an average of about 0.5 feet. However, the general trend over the last few years has been toward increasing groundwater levels.

DNR Observation Wells

DNR measures water levels monthly in three observations wells:

- Brown's Creek Park – Deep well completed in the Tunnel City Group aquifer
- Brown's Creek Park – Shallow well completed in the Quaternary (glacial) aquifer
- Withrow School – Well completed in the Prairie du Chien aquifer

Groundwater elevation data from the DNR observation wells are shown on Figure 2. Data from the Brown's Creek – Deep well collected before September 2007 are erratic and suggest measurement problems, so they are not shown on the graph.

Golf Course Wells

We suspended collection of groundwater data from the golf course wells after having problems with getting water level indicators stuck in the wells. We acquired a new thin tape that we believe will work better. We propose to collect water levels at the golf course wells again in 2016, both during the winter months (if accessible) and in late summer along with the other wells.

Recommendations

BCWD should continue to collect groundwater elevation data on an annual basis. The long-term data and analyses are important for understanding conditions throughout the District, particularly the thermal impairment of Brown's Creek. The network of residential and golf course wells provides data throughout the watershed from all major aquifers. The on-going collection of these data will be critical to eventually constructing a groundwater model of the watershed.

Table 1. Groundwater Elevation Measurements

Unique_ No	Name	March 2012 Water Elevation	August 2012 Water Elevation	2013 Water Elevation	2014 Water Elevation	2015 Water Elevation		Change 2014 to 2015	Change - All data
Approximate Date		Mar-12	Aug-12	Aug-13	Aug-14	Aug-15			
Golf Course Wells									
515171	Dean Grundstrom	889.55	887.97	887.34					
151580	Pete Mogren	825.12	819.62						
151581	Pete Mogren	827.51	774.75						
208038	Marlin Murphy	756.91	749.66						
Sawmill 1	John McCarthy	906.75	904.38						
Sawmill 2	John McCarthy	905.55	898.50						
Sawmill 3	John McCarthy	906.38	903.59	906.36					
Sawmill 4	John McCarthy		902.62						
566145	John McCarthy		898.91	900.21					
Domestic Wells									
428563	Ed and Laurie Francis	897.43	893.03	896.14	898.01	897.56		-0.45	0.13
410987	Dan and Lori Gunderson	901.56	899.90	900.01	900.99	901.89		0.90	0.33
196839	Lewis J. Bruno	862.84	857.03	860.70					-2.14
Leiser	Craig Leiser	929.57	929.36	929.84	932.13	931.27		-0.86	1.70
James	Alan and Molly James	936.71	936.47		939.00	937.59		-1.41	0.88
184049	Kirk and Tracy Hillquist	938.57	938.25	940.29	940.86	939.20		-1.66	0.63
Thatcher	Jyneen Thatcher	949.35	948.94	947.88	951.97	950.55		-1.42	1.20
138188	Rick Vanzwol	934.14	930.59	927.24	935.48	934.74		-0.74	0.60
479665	John and Michelle Weaver	904.16		900.99		899.73		-1.26	-4.43
493250	Mark and Sharon Olien	720.30	716.97	713.74	720.64				0.34
525197	James and Marilyn Opp			907.93	909.80	910.04		0.24	2.11
505390	Larry J and Pamela J Larson		924.70		925.98				1.28
153485	John P and Carolyn A Rydel		893.58	893.98	896.20	895.51		-0.69	1.93
138904	Duane and Margaret Burmeister				828.79	827.21		-1.58	-1.58
406204	Stuart & Susan Grubb			938.96	939.12	939.00		-0.12	0.04
DNR Observation Wells									
595649	Brown's Creek Park - Deep	861.86	861.56	861.74	862.15	862.51		0.36	0.65
623066	Brown's Creek Park - Shallow	876.40	874.48	875.43	874.91	874.03		-0.88	-2.37
551565	Withrow Elementary School	947.68	949.39	947.80	949.40	951.27		1.87	3.59
						Average		*-0.51*	*0.27*

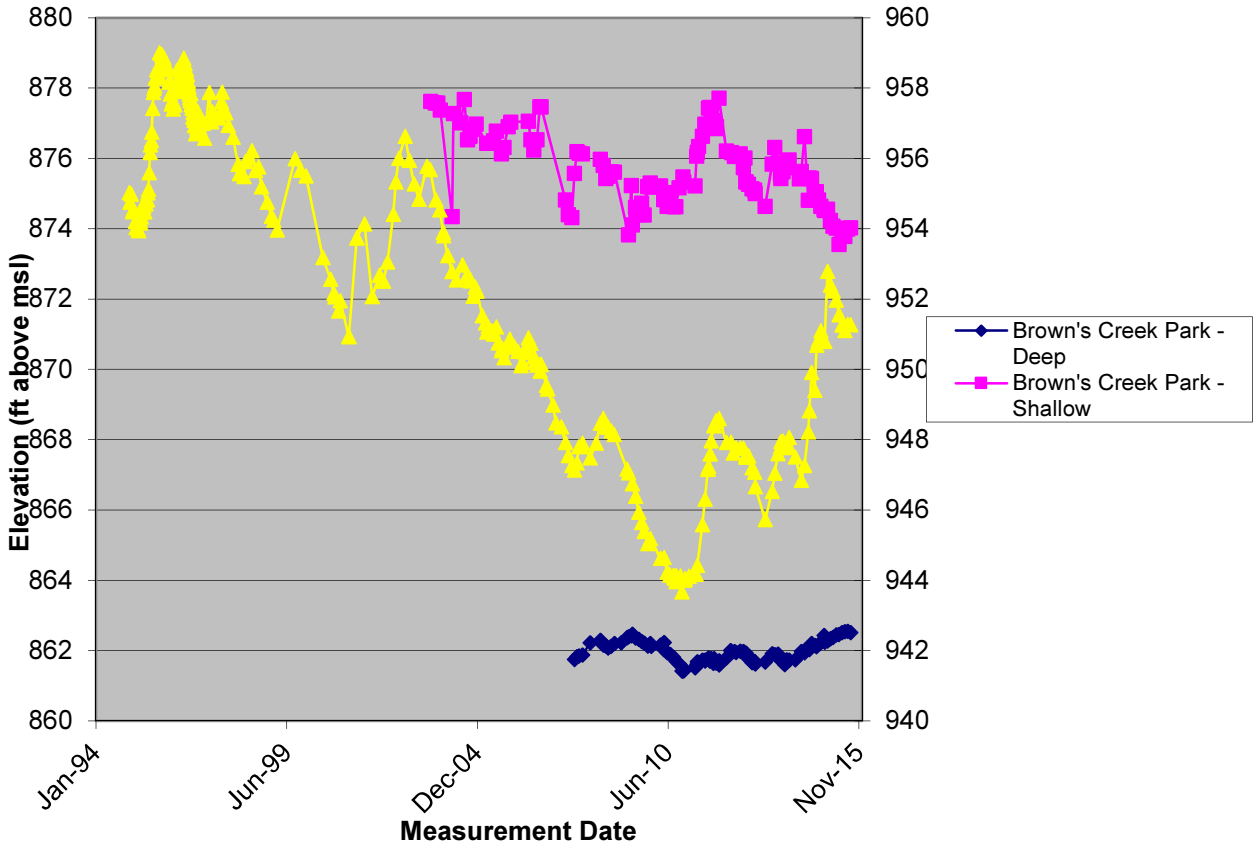

Figure 1. Groundwater Elevations: DNR Observation Wells