



2016 Water Quality Monitoring Report

January – December 2016

Appendix 4

Groundwater Monitoring Network Sample Results

Minnesota Department of Agriculture

625 Robert Street North, Saint Paul, MN 55155

www.mda.state.mn.us

Published July 2017

In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-6000. TTY users can call the Minnesota Relay Service at 711. The MDA is an equal opportunity employer and provider.

Authors and Contributors

Monitoring and Assessment Unit Hydrologists –Heather Johnson, Marie Juenemann, Michael MacDonald, Scott Matteson, Jeff Paddock, Katie Rasmussen, Matt Ribikawskis, Brennon Schaefer, Dylan Timm, and David Tollefson.

Monitoring and Assessment Unit Supervisor - Bill VanRyswyk;

Editor – Hydrologist, Heather Johnson

Minnesota Department of Agriculture
Pesticide and Fertilizer Management Division
Monitoring and Assessment Unit

Acknowledgements

The following personnel and cooperating organizations were critical to the collection of much of the data presented in this report:

MDA Laboratory Water Analysis Unit
MDA Staff: Stefan Bischof, Russ Derickson, Dan Langseth, and Luke Stuewe

Chippewa River Watershed Project, Fillmore County SWCD, Hawk Creek Watershed Project, International Water Institute, Metropolitan Council Environmental Services, Minnesota Department of Natural Resources, Minnesota Pollution Control Agency, Mower County SWCD, Redwood Cottonwood River Control Area, University of Minnesota-Duluth, Natural Resources Research Institute (NRRI), U.S. Geological Survey, and Weck Laboratory.

Due to the large number of samples and analytes in 2016, these tabulated results have only been made available online at the Monitoring and Assessment web page (www.mda.state.mn.us/monitoring).

Minnesota Department of Agriculture
GROUNDWATER QUALITY SAMPLE DATA SETS
to accompany
MDA 2016 WATER QUALITY MONITORING REPORT

COMMENTS FOR MDA GROUNDWATER MONITORING SAMPLE RESULTS TABLES:

Groundwater monitoring sample results presented in the following tables are exclusive to what has been provided in the 2016 MDA Master Groundwater Data Set. *Only analytes that had a detection are displayed in the following tables.* For a complete list of analytes, refer to Table 1 in the 2016 MDA Water Quality Monitoring Report.

1. Quantitative results are reported when analytical results are greater than or equal to the Method Reporting Limit or Estimated Reporting Limit found in the MDA 2016 Water quality Monitoring Report.
2. Quality Assurance/Quality Control samples are not included in the following tables.
3. Results in **bold** indicate an exceedance of 10.00 mg/L MDH health risk limit for nitrate.
4. D in the Unique Well Number column indicates a domestic well
5. NA – Sample bottle broken at lab, sample not analyzed for LC MS/MS analytes
6. NA* - Sample collected before laboratory had finalized analytical method.
7. One sample bottle from the initial April sample from well 733725 was broken. Second sample was collected later in the month. Sampled April 11 and April 25 2016. Sample results were combined on table for the GC MS/MS and LC MS/MS analysis.

PMR	County	Unique Well Number	Sample Date	Nitrate nitrogen (mg/L)	Pesticide Concentration (ng/L)																																						
					2,4-D	Acetochlor	Acetochlor ESA	Acetochlor OXA	Alachlor ESA	Alachlor OXA	Aminopyralid	Atrazine	Benazoxon	Bicyclopyrone	Bromacil	Clpyralid	Clothianidin	DEDI Atrazine	Desisopropylatrazine	Desethylatrazine	Dimethenamid	Dimethenamid ESA	Dimethenamid OXA	Diuron	Flumetsulam	Hydroxyatrazine	Imazamox	Imazapyr	Imazethapyr	Imidacloprid	Metolaxyl	Metolachlor	Metolachlor ESA	Metolachlor OXA	Metribuzin	Metribuzin DADK	Metribuzin DK	Metsulfuron-methyl	Nicosulfuron	Picloram	Safinacil	Thiamethoxam	Triclopyr
PMR09	Fillmore	Fountain Spring E	9/9/2016	7.54	14.4	< 30	41.5	< 33.3	< 41.6	< 33.3	< 25	< 30	< 5	< 10	< 30	< 41.6	28.7	< 50	< 150	< 50	< 15	28.3	< 10	< 13.3	< 50	20.3	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	901	114	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	Fountain Spring W	6/13/2016	13.5	< 8.3	< 30	76.7	< 33.3	50.8	< 33.3	< 25	32.3	< 5	< 10	< 30	< 41.6	< 25	65.5	< 150	54.3	< 15	< 6.7	< 10	< 13.3	< 50	15.4	< 13.3	< 8.3	< 6.7	< 20	< 8.3	137	1330	85.5	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	Fountain Spring W	9/9/2016	6.04	< 8.3	< 30	38.7	< 33.3	45.9	< 33.3	< 25	< 30	< 5	< 10	91.8	< 41.6	< 25	< 50	< 150	53.6	< 15	< 6.7	< 10	< 13.3	< 50	26.3	< 13.3	19.5	< 6.7	< 20	< 8.3	26.1	651	79.8	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	Lanesboro Spring	2/9/2016	6.78	< 8.3	< 30	< 30	< 33.3	91.9	< 33.3	NA*	37.1	< 5	NA*	< 30	< 41.6	< 25	67.2	< 150	69.2	< 15	< 6.7	< 10	< 13.3	< 50	7.51	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	404	10.8	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	Lanesboro Spring	8/12/2016	7.22	< 8.3	< 30	< 30	< 33.3	50.8	< 33.3	< 25	< 30	< 5	< 10	< 30	< 41.6	< 25	102	< 150	< 50	< 15	< 6.7	< 10	< 13.3	< 50	8.78	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	431	< 10	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	Peterson Main Spring	2/9/2016	4.47	< 8.3	< 30	< 30	< 33.3	241	< 33.3	NA*	39.7	< 5	NA*	< 30	< 41.6	< 25	< 50	< 150	86.8	< 15	< 6.7	< 10	< 13.3	< 50	< 6.7	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	260	< 10	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	Peterson Main Spring	8/12/2016	4.4	< 8.3	< 30	< 30	< 33.3	123	< 33.3	< 25	< 30	< 5	< 10	< 30	< 41.6	< 25	64.3	< 150	59.6	< 15	< 6.7	< 10	< 13.3	< 50	< 6.7	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	277	< 10	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	Rainy Spring	6/13/2016	14.6	< 8.3	97	35.1	< 33.3	64.6	< 33.3	< 25	52.2	< 5	< 10	< 30	< 41.6	< 25	179	< 150	54.5	< 15	< 6.7	< 10	< 13.3	< 50	13.6	< 13.3	< 8.3	< 6.7	< 20	< 8.3	127	1050	31	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	Rainy Spring	9/9/2016	9.46	< 8.3	43	295	73.2	43	< 33.3	< 25	33.3	< 5	< 10	< 30	< 41.6	27.1	111	< 150	68.9	< 15	< 6.7	< 10	< 13.3	< 50	16.2	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	878	53.3	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Wabasha	D	9/28/2016	3.52	< 8.3	< 30	< 30	< 33.3	< 41.6	< 33.3	< 25	< 30	< 5	< 10	< 30	< 41.6	< 25	< 50	< 150	< 50	< 15	< 6.7	< 10	< 13.3	< 50	< 6.7	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	54.8	< 10	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Goodhue	D	9/29/2016	8.49	< 8.3	< 30	111	< 33.3	840	< 33.3	< 25	< 30	6.79	< 10	< 30	< 41.6	< 25	122	< 150	74.4	< 15	< 6.7	< 10	< 13.3	< 50	13.1	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	443	< 10	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Wabasha	D	9/30/2016	10	< 8.3	< 30	67.7	< 33.3	866	< 33.3	< 25	< 30	< 5	< 10	< 30	< 41.6	< 25	< 50	< 150	< 50	< 15	< 6.7	< 10	< 13.3	< 50	< 6.7	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	628	78	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	D	9/30/2016	6.73	< 8.3	< 30	251	< 33.3	285	< 33.3	< 25	< 30	< 5	< 10	< 30	< 41.6	< 25	< 50	< 150	< 50	< 15	< 6.7	< 10	< 13.3	< 50	< 6.7	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	210	< 10	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	D	9/30/2016	5.75	< 8.3	< 30	< 30	< 33.3	292	< 33.3	< 25	< 30	< 5	< 10	< 30	< 41.6	< 25	< 50	< 150	< 50	< 15	< 6.7	< 10	< 13.3	< 50	< 6.7	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	609	23.6	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	D	9/30/2016	11.2	< 8.3	< 30	77.2	< 33.3	< 41.6	< 33.3	< 25	< 30	< 5	< 10	< 30	59.5	< 25	< 50	< 150	< 50	< 15	< 6.7	< 10	< 13.3	< 50	< 6.7	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	171	< 10	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Goodhue	D	9/29/2016	10.9	< 8.3	< 30	< 30	< 33.3	< 41.6	< 33.3	42	< 30	< 5	< 10	< 30	< 41.6	32.6	57.6	< 150	< 50	< 15	< 6.7	< 10	< 13.3	< 50	< 6.7	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	28.8	< 10	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Wabasha	D	9/30/2016	10.1	< 8.3	< 30	52.8	< 33.3	772	< 33.3	< 25	40.1	< 5	< 10	< 30	< 41.6	< 25	189	< 150	68.7	< 15	< 6.7	< 10	< 13.3	< 50	< 6.7	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	1030	47.8	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Wabasha	D	9/29/2016	9.63	< 8.3	< 30	79.3	< 33.3	118	< 33.3	< 25	93.3	< 5	< 10	< 30	< 41.6	< 25	239	< 150	162	< 15	< 6.7	< 10	< 13.3	< 50	9.79	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	362	< 10	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Wabasha	D	9/30/2016	12.4	< 8.3	< 30	< 30	< 33.3	< 41.6	< 33.3	< 25	< 30	< 5	< 10	< 30	< 41.6	< 25	< 50	< 150	< 50	< 15	< 6.7	< 10	< 13.3	< 50	< 6.7	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	< 10	< 10	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Wabasha	D	9/28/2016	6.82	< 8.3	< 30	< 30	< 33.3	46.3	< 33.3	< 25	75.9	< 5	< 10	< 30	< 41.6	< 25	119	< 150	90.9	< 15	< 6.7	< 10	< 13.3	< 50	17.4	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	296	< 10	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Wabasha	D	9/28/2016	21.3	< 8.3	49	1370	568	1090	312	123	76.2	1920	< 10	< 30	< 41.6	43	495	222	741	< 15	12.4	< 10	< 13.3	< 50	41.1	< 13.3	< 8.3	< 6.7	< 20	< 8.3	34.7	816	314	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	Root River Spring	6/13/2016	9.73	< 8.3	< 30	< 30	< 33.3	237	< 33.3	< 25	42.2	< 5	< 10	< 30	< 41.6	< 25	180	< 150	72.7	< 15	< 6.7	< 10	< 13.3	< 50	17.5	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	1650	24.2	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Fillmore	Root River Spring	9/9/2016	5.4	< 8.3	< 30	< 30	< 33.3	223	< 33.3	< 25	52.2	< 5	< 10	< 30	< 41.6	< 25	149	< 150	112	< 15	< 6.7	< 10	< 13.3	< 50	13.6	< 13.3	< 8.3	< 6.7	< 20	< 8.3	< 25	1320	22.7	< 75	< 500	< 500	< 23.3	< 26.6	< 41.6	< 15	< 25	< 50
PMR09	Goodhue	Spring Creek Spring	6/10/2016	8.68	< 8.3	< 30	121	< 33.3	513	< 33.3	< 25	38.7	< 5	< 10	< 30	< 41.6	< 25	264	< 150	91.6	< 15	< 6.7	< 10	< 13.3	< 50	< 6.7	< 13.3	8.63	< 6.7														