

Final Report

**on a Claim of Water Right Impairment
In the Case of**

Water Right File No. 41,475

**Phase I
Technical Evaluation
of the Merits of the Complaint**



January 31, 2011

John W. Munson
Environmental Scientist
Division of Water Resources
Kansas Department of Agriculture

Summary: On July 1, 2009, the Kansas Department of Agriculture, Division of Water Resources (DWR), Stafford field office received a written complaint of impairment from John Schmidt, owner and operator of an irrigation well in Harvey County, Water Right File No. 41,475. Citing a significant reduction to his historical pumping rate, Mr. Schmidt alleged his well was being impaired by pumping the neighboring junior irrigation well to the north, Water Right File No. 47,110. On July 13 DWR staff instrumented the Schmidt well and neighboring irrigation well with water level sensors to monitor the depths to water over time. When the neighboring irrigation well turned on and off during the irrigation season no corresponding changes in water level at the Schmidt well were observed. DWR staff also read water meters at these wells on four occasions. No well-to-well interference was observed.

Complaint: In his written complaint, Mr. Schmidt stated that when he first started his well on June 28, 2009, it pumped 500 gallons per minute (“gpm”) and dropped to 450 gpm after pumping for two days. Mr. Schmidt also reported that the neighboring irrigation well was operating at the time and had been pumping for 10 days. Mr. Schmidt stated that his well pumped between 700 gpm and 750 gpm in previous years. See Attachment 1.

Location: The Schmidt well and the neighboring well are located in rural Harvey County. See Figure 1. The nearest well to the Schmidt well is actually a municipal well, Water Right File No. 42,127, located about 2,000 feet to the southwest. The Schmidt well and neighboring irrigation well to the north are about 2,370 feet apart. There is another municipal well, Water Right File No. 41,418 located to the south. See Figure 2. The municipal wells were not monitored because there are no water level measurement tubes to install water level sensors. DWR did not monitor pumping rates, pumping times, or water levels at the nearby municipal wells at this phase of the investigation because Mr. Schmidt asked DWR to investigate whether the nearby junior irrigation well is impairing his senior water right.

Well Log: The well driller’s log for Mr. Schmidt’s irrigation well 41,475 indicates a well depth of 108 feet to shale, well screening from 55 feet to 108 feet, and a depth to water of 22.6 feet on May 11, 1996. See Attachment 2.

Schmidt and Other Well Locations in Rural Harvey County

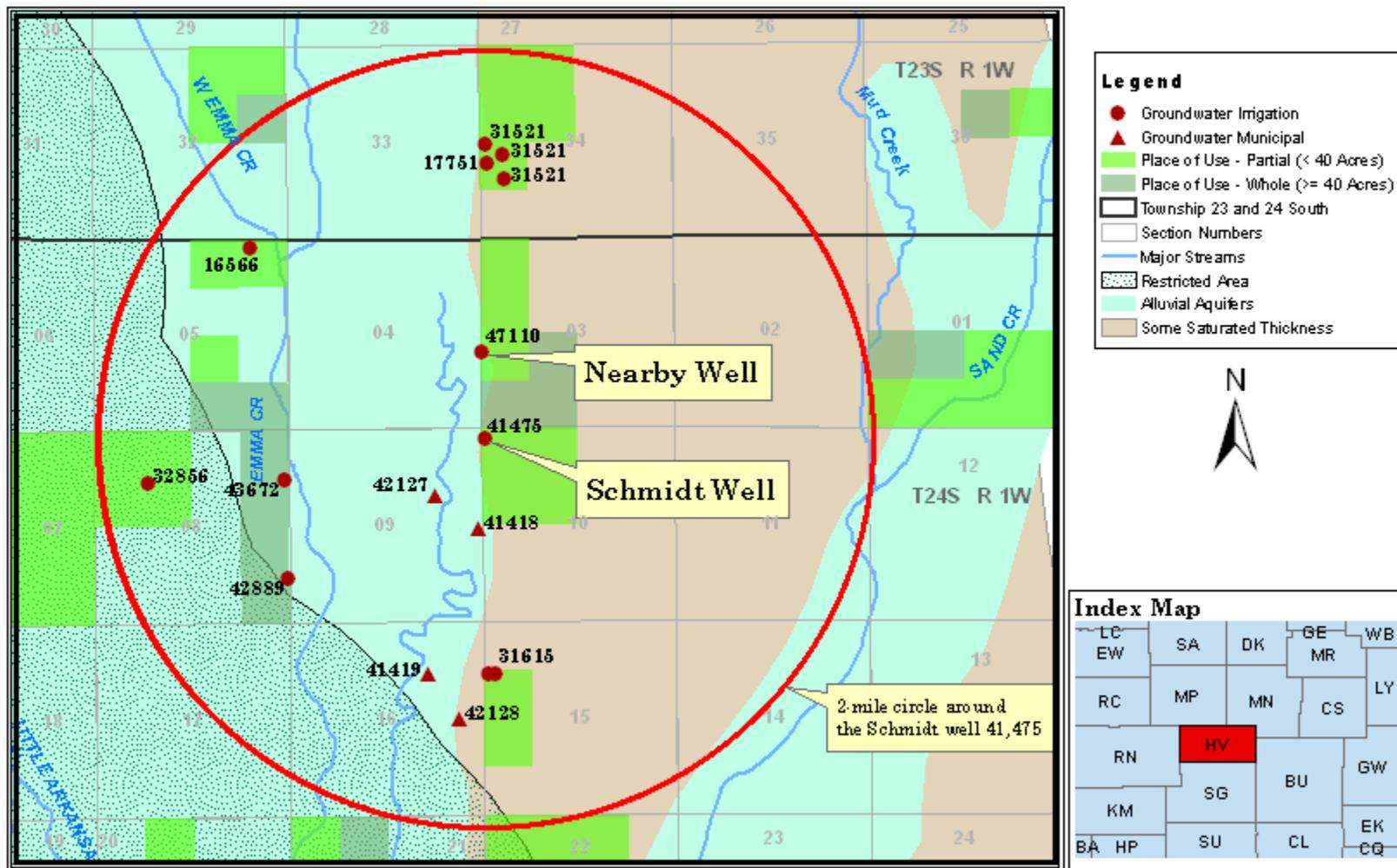


Figure 1 - Location of Schmidt and Nearby Wells



Figure 2 – Aerial photograph (2002) with plots of Schmidt well 41,475; neighboring irrigation well 47,110 to the north, and two municipal wells 41,418 and 42,127 to the south and southwest

Investigation: The purpose of this stage of the investigation was to determine if the well-to-well interference described in the complaint could be observed and whether the claim warranted further investigation. Stafford field office staff installed water level monitoring equipment on July 13, 2009 at the senior irrigation well (Schmidt; 41,475); at the junior irrigation well to the north (47,110); and at an observation well (obs47110) located about 30 feet from the junior irrigation well. The field office staff also performed five minute timed meter reading tests to observe the pumping rates of both wells. See Table 2. Water level data was collected for the remainder of the 2009 irrigation season. See Figures 3, 4 and 5. Water level monitoring continued throughout the 2010 season. See Figure 6.

Review of Tested Rates and Water Use Reports: Table 1 shows the rates of diversion reported by Mr. Schmidt on the annual water use reports for his irrigation well. Note that the 700 gpm rate was reported only when the meter was reported as broken.

Year	Reported Rate of Diversion (gpm)	Note
1996	500	
1997		rate not reported
1998	600	
1999	600	
2000	600	
2001	600	
2002	600	
2003	600	
2004	600	
2005		rate not reported
2006		rate not reported
2007	700	meter broken
2008	700	meter broken

Table 1 - Reported Rate of Diversion of Water by Year for the Schmidt well 41,475

The field inspection report dated June 6, 2001 for Mr. Schmidt’s well indicates that the tested rate was 483 gpm under normal conditions. The maximum rate was 646 gpm during a two minute test. However a certificate of appropriation for beneficial use of water, File No. 41,475 was issued for a rate of 705 gpm based on a theoretical additional 57.6 gpm the well might pump when operating an end gun (57.6 gpm + 646.9 gpm ≈705 gpm). See Attachment 2.

In response to the impairment complaint in 2009, water level monitoring equipment was installed and five minute timed tests of the pumping rates of the two irrigation wells were conducted on two occasions at each well. See Table 2.

Five Minute Timed Meter Readings and Water Level Equipment Installation			
Date	Well	Rate (gpm)	Equipment
July 1, 2009	Schmidt, 41,475	430	
July 1, 2009	47,110; junior well	400	
July 13, 2009	Schmidt; 41,475	468	water level equipment installed
July 13, 2009	47,110; junior well		water level equipment installed
July 13, 2009	Observation well		water level equipment installed
August 26, 2009	47,110; junior well	458	

Table 2 - Five Minute Timed Meter Readings and Monitoring Equipment Installation

The junior irrigation well 47,110 to the north of Mr. Schmidt was approved, drilled, and pumped in 2009. The municipal well, Water Right File No. 42,127 located to the southwest of Mr. Schmidt’s well is approximately 300 to 400 feet closer to Mr. Schmidt’s well than the irrigation well to the north. Figure 2 shows another municipal well, Water Right File No. 41,418 to the south. Neither municipal well has been tested for pumping rate.

Table 3 is a summary of the authorized quantities and the 2009 reported quantities and rates. The 2009 reported pumping rate of the nearest municipal well 42,127 was 468 gpm. The reported pumping rate of 468 gpm is the same pumping rate observed at Mr. Schmidt’s irrigation well on July 13, 2009. See Table 2. The annual authorized quantities for the nearby municipal wells are limited to a total annual quantity of 572.5 acre-feet. It is reasonable to expect that given similar pumping rates and distances between the Schmidt and irrigation well to the north, and the Schmidt and municipal wells to the south and southwest, direct effects of the irrigation and municipal wells on the Schmidt irrigation well during the same pumping periods would also be similar.

File No.	Use	Authorized Quantity (acre-feet)	2009 Reported Rate (gpm)	2009 Reported Use (acre-feet)
41,418	Municipal	572.50	383	32
41,475 (Schmidt)	Irrigation	182.00		69
42,127	Municipal	500.01	468	498
47,110 (junior)	Irrigation	200.20		55

Table 3 – Authorized Quantities and 2009 Reported Rates and Quantities Used

Review of Water Level Data: Review of the water level monitoring data in 2009 at the Schmidt well 41,475; junior irrigation well 47,110; and observation well obs47110 does not indicate well-to-well interference. When one irrigation well is not pumping and the other irrigation well either stops pumping or starts pumping there is no observable corresponding change in water level at the well that has not been pumping. The annotated hydrographs of the water level data in Figures 3 and 4 illustrate the absence of interference between the irrigation wells.

In Figure 3 the depth to water at the Schmidt well is shown in red and the depth to water at the junior irrigation well to the north is shown in blue. The depth to water at the observation well about 30 feet from the junior irrigation well is shown in black. In late July the Schmidt well was not pumping and the water level was rising. During this period the junior irrigation well started pumping, pumped a few days, and then stopped pumping. The water level at the junior well changed from about 40 feet to about 80 feet while it was pumping, the water level at the nearby observation well changed from about 40 feet to about 60 feet, but the water level at the Schmidt well continued to rise. Similarly in late August when the junior well was not pumping and the Schmidt well started pumping, no decline in water level was observed at the junior irrigation well or the observation well near the junior irrigation well.

Figure 4 shows the depth to water is about 90 feet at the Schmidt well whether the irrigation well to the north is pumping or not. In mid-July and the second week in August when both irrigation wells are pumping, the depth to water at the Schmidt well is about 90 feet and remains so when the junior irrigation well stops pumping. At the end of August when the junior well is not pumping, Mr. Schmidt’s well depth to water is still about 90 feet while pumping.

The hydrograph in Figure 5 from August 13 to August 18, 2009, is part of the same pumping period as in Figures 3 and 4. There was 18 feet of water in the bottom of the Schmidt well when the pumping depth to water was 90 feet whether the junior irrigation well was pumping or not.

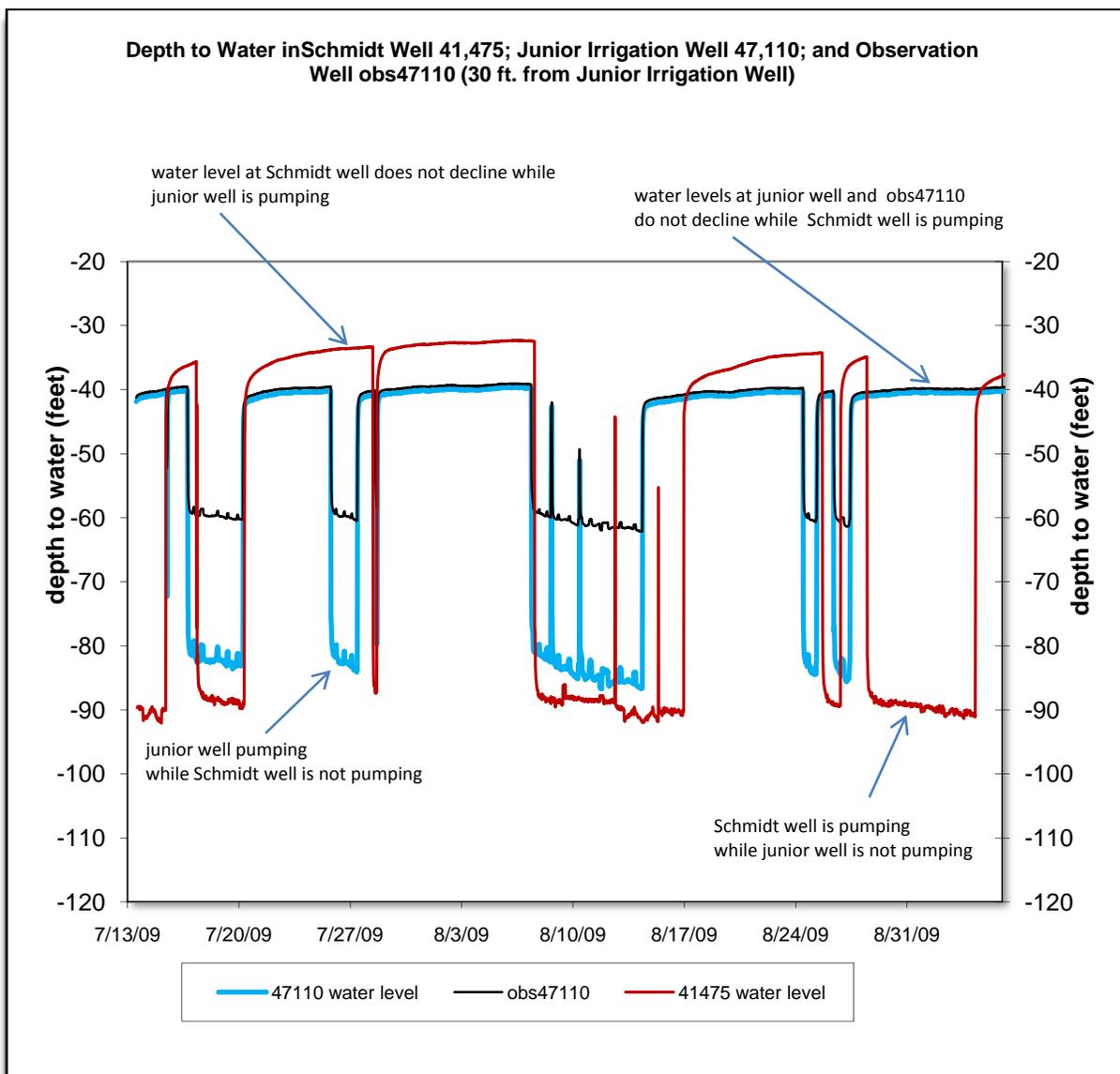


Figure 3 - 2009 Water Level Data for the Schmidt, Junior Irrigation, and Observation Wells

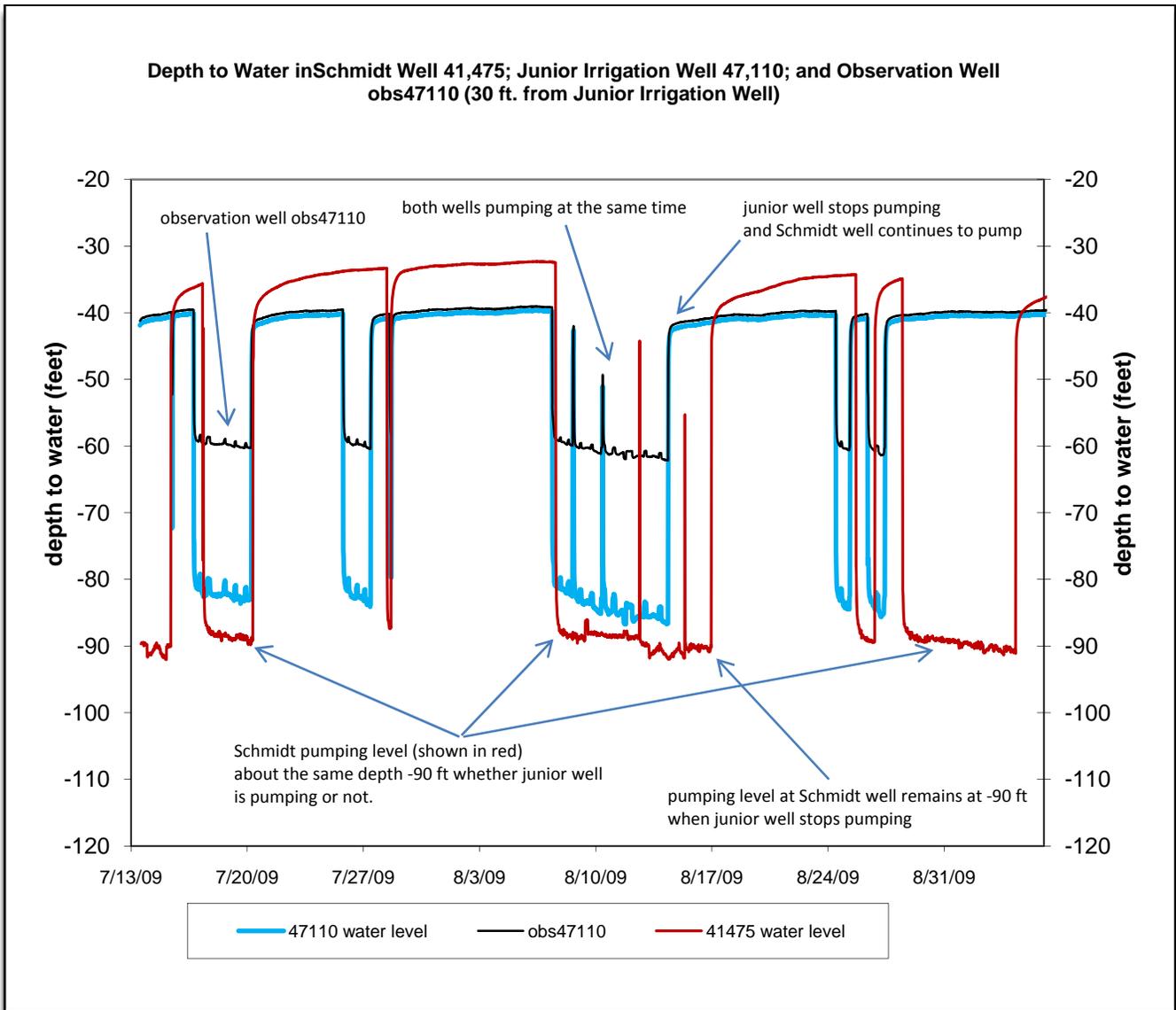


Figure 4 - 2009 Water Level Data for the Schmidt, Junior Irrigation, and Observation Wells

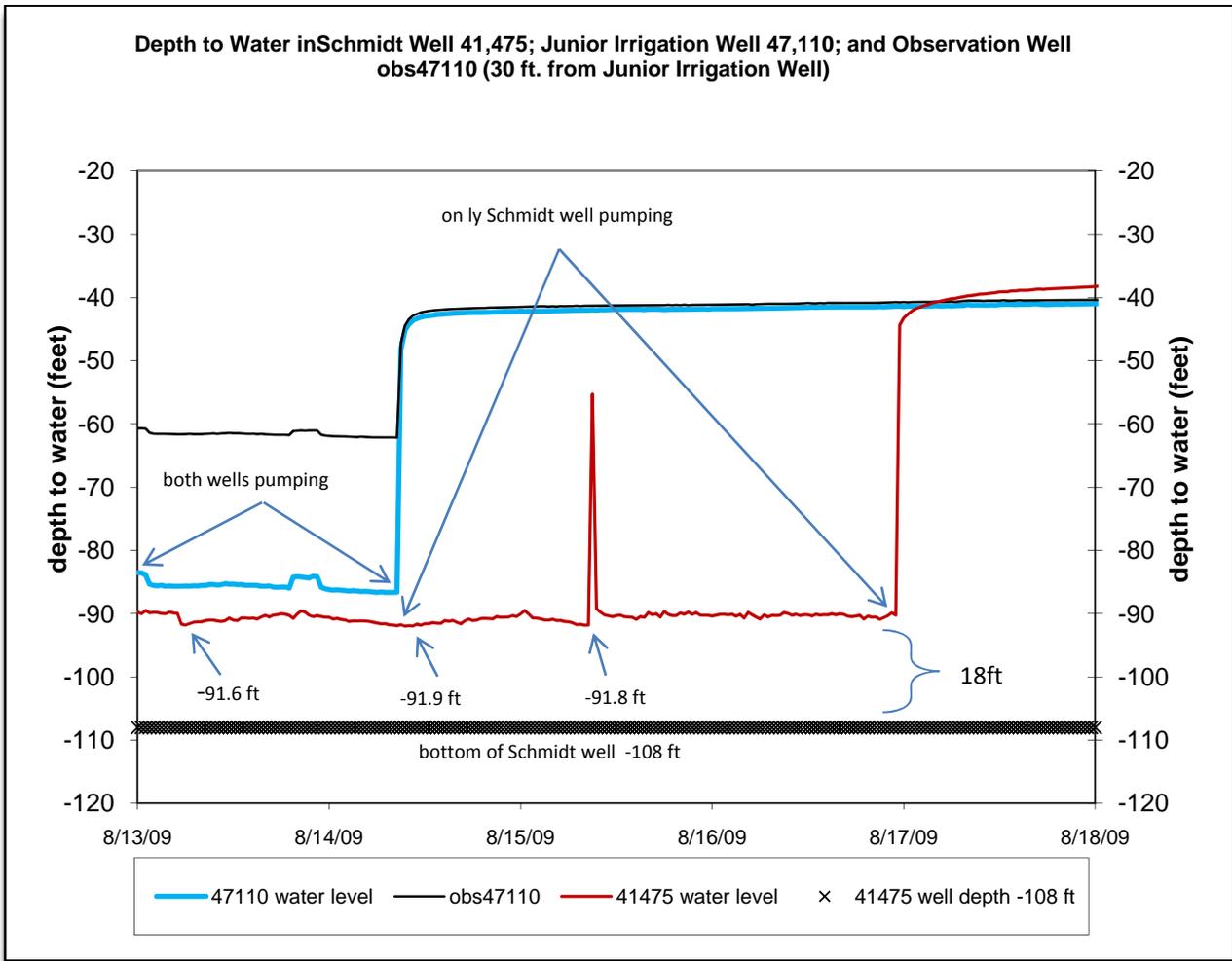


Figure 5 - 2009 Water Level Data for the Schmidt, Junior Irrigation, and Observation Wells

Additional water level data was collected in 2010. During the irrigation season the Schmidt well and the junior irrigation well to the north typically pumped at the same time. Figure 6 shows water level data for August of 2010. In mid-August the junior irrigation well started pumping while the Schmidt well was pumping and no change in the pumping water level was observed in the Schmidt well. In the last week of August the Schmidt well started pumping while the junior well was not pumping and no change in water level was observed in the junior irrigation well.

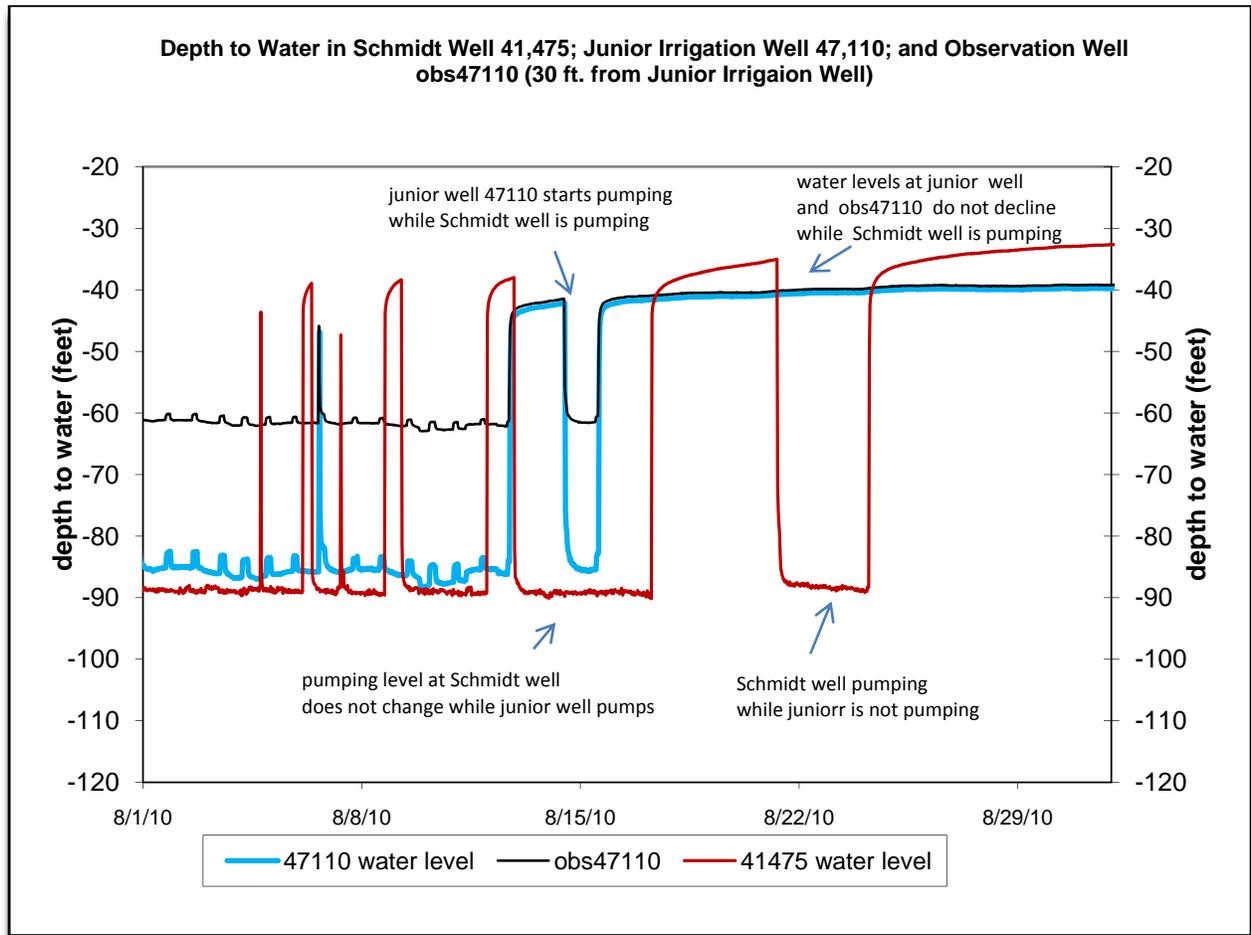


Figure 6 - 2010 Water Level Data for the Schmidt, Junior Irrigation, and Observation Wells

CONCLUSION

The Division was able to install appropriate water level monitoring equipment over a time period that was conducive to determining with a high degree of confidence the lack of well-to-well interference between the Schmidt irrigation well and the junior irrigation well to the north. Based on review of the information and data collected in 2009, the Division concludes that there is no discernable well-to-well interference between Mr. Schmidt’s irrigation well 41,475 and the junior irrigation well 47,110 to the north. When the junior irrigation well pumps water there is no observable corresponding change in water level at Mr. Schmidt’s well. Additional water level data collected in 2010 supports the same conclusion.

Attachment 1 – The Written Complaint

07/08/09 WED 14:36 FAX 6202346900

WATER RESOURCES

+++ HEADQUARTERS

002

July 1, 2009

Jeff Lanterman, Acting Water Commissioner
Division of Water Resources, Stafford Field Office
300 S. Main
Stafford, KS 67578

Dear Mr. Lanterman:

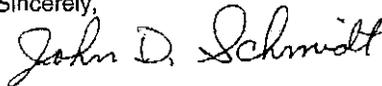
The purpose of this letter is to file an impairment complaint concerning my irrigation well authorized by Water Right No. 41475. A new irrigation well authorized by Water Permit No. 47110 was installed this spring less than 1/2 mile north of my irrigation well. In previous years, my irrigation well operated at a rate between 700 and 750 gallons per minute. Upon starting my irrigation well for the first time this year on June 28, 2009, I noticed the rate of my well at only 500 gallons per minute. After two days of operation, the rate dropped to 450 gallons per minute. The well authorized by Water Permit No. 47110 was operating at the time and had been pumping continuously for approximately 10 days. I have checked my well's pumping equipment and it all appears to be functioning properly.

I believe the operation of the irrigation well authorized by Water Permit No. 47110 is reducing the rate at which my irrigation well authorized by Water Right No. 41475 can operate, thus impairing my ability to irrigate my place of use properly. Some of my center pivot nozzles are pumping air, whereas in previous years they typically did not. Additionally, the reduced pumping rate will cause my center pivot to take longer to complete a pass to irrigate the soybean crop planted on the place of use.

I respectfully request that the Division of Water Resources investigate the impairment claim and take appropriate action to restore my well's pumping rate to the rate it pumped prior to the installation and operation of the well authorized by Water Permit No. 47110. You may contact me at the address or telephone number listed below.

Thank you for prompt consideration and action in this matter.

Sincerely,



John D. Schmidt
5701 SW 48th Street
Sedgwick, Kansas 67135-9005
Home: 316-283-8462

RECEIVED

JUL 06 2009

STAFFORD FIELD OFFICE
DIVISION OF WATER RESOURCES

WATER RESOURCES
RECEIVED

JUL 08 2009

KS DEPT OF AGRICULTURE

Attachment 2 – Well Driller’s Log for Mr. Schmidt’s well

1 LOCATION OF WATER WELL:		FRACTION		Section Number		Township Number		Range Number	
Harvey		NW 1/4 NW 1/4 NW 1/4		10		T 24 S		R 1W EW	
Distance and direction from nearest town or city street address of well if located within city? 5 miles North of Sedwick, Kansas									
2 WATER WELL OWNER:		SCHMIDT, John		Board of Agriculture, Division of Water Resources		Application Number:		41.475	
RR#, ST. ADDRESS, BOX #:		5701 S.W. 48th		Sedwick, Kansas		67135			
CITY, STATE, ZIP CODE:		Sedwick, Kansas		67135					
3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:		4 DEPTH OF COMPLETED WELL 108 ft. ELEVATION:							
		Depth(s) groundwater Encountered 1 ft. 2 ft. 3 ft. WELL'S STATIC WATER LEVEL 22.6 FT. BELOW LAND SURFACE MEASURED ON 05/11/1996 Pump test data: Well water was ft. after hours pumping gpm Est. Yield 700 gpm: Well water was ft. after hours pumping gpm Bore Hole Diameter 30 in. to 108 ft. and in. to ft. WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well 1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below) 2 Irrigation 4 Industrial 7 Lawn and garden only 10 Monitoring well Was a chemical/bacteriological sample submitted to Department? Yes No <input checked="" type="checkbox"/> ; If yes, mo/day/yr sample was submitted Water Well Disinfected? Yes <input checked="" type="checkbox"/> No							
5 TYPE OF CASING USED:		5 Wrought iron		8 Concrete tile		CASING JOINTS:		Clued <input checked="" type="checkbox"/> Clamped	
1 Steel 3 RMP (SR)		6 Asbestos-Cement		9 Other (Specify below)		Welded		Threaded	
2 PVC 4 ABS		7 Fiberglass		SDR-26		Blank casing Diameter 16 in. to 55 ft., Dia		in. to ft.	
Blank casing Diameter 16 in. to 55 ft., Dia		weight 19.750 lbs./ft.		Wall thickness or gauge No. .616		Casing height above land surface 12 in.			
TYPE OF SCREEN OR PERFORATION MATERIAL:		1 Steel 3 Stainless Steel		5 Fiberglass		8 RMP (SR)		11 other (specify)	
2 Brass 4 Galvanized steel		6 Concrete tile		9 ABS		12 None used (open hole)			
SCREEN OR PERFORATION OPENING ARE:		1 Continuous slot 3 Mill slot		5 Gauzed wrapped		8 Saw cut		11 None (open hole)	
2 Louvered shutter 4 Key punched		7 Torch cut		6 Wire wrapped		9 Drilled holes		10 Other (specify)	
SCREEN-PERFORATION INTERVALS:		from 55 ft. to 108 ft.		ft. From ft. to ft.		ft. From ft. to ft.		ft. From ft. to ft.	
GRAVEL PACK INTERVALS:		from 20 ft. to 108 ft.		ft. From ft. to ft.		ft. From ft. to ft.		ft. From ft. to ft.	
6 GROUT MATERIAL:		1 Neat cement		2 Cement grout		3 Bentonite		4 Other bentonite hole plug	
Grout Intervals: From 0 ft. to 20 ft.		ft. From ft. to ft.		ft. From ft. to ft.		ft. From ft. to ft.		ft. From ft. to ft.	
What is the nearest source of possible contamination:		1 Septic tank 4 Lateral lines		7 Pit privy		10 Livestock pens		14 Abandon water well	
2 Sewer lines 5 Cess pool		8 Sewage lagoon		12 Fertilizer storage		15 Oil well/Gas well		16 Other (specify below)	
3 Watertight sewer lines 6 Seepage pit		9 Feedyard		13 Insecticide storage		None Apparent			
Direction from well?		LITHOLOGIC LOG		FROM TO		FROM TO		How many feet?	
FROM TO		LITHOLOGIC LOG		FROM TO		FROM TO		How many feet?	
0 2 soil				108 109		black shale			
2 19 brown clay									
19 25 medium sand and gravel									
25 40 brown clay									
40 54 very sandy brown clay									
54 60 very fine sand									
60 67 medium to coarse sand and gravel (loose)									
67 78 medium sand & gravel, loose									
78 80 brown clay									
80 94 medium sand & gravel, loose									
94 99 brown clay									
99 103 medium sand & gravel w/clay									
103 108 medium sand & gravel (very loose)									
7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 05/11/1996 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 236 This Water Well Record was completed on (mo/day/yr) 05/13/96 Under the business name of Harp Well & Pump Service, Inc. by (signature) Jane Frederick									

Attachment 3 – Certificate of Appropriation, File No. 41,475 page 1

