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April 30, 1947

Mr. R. N. Parnell
Engineer
USDI, Bureau of Reclamation
Holbrook, Arizona

Dear Mr. Parnell:

A few weeks ago Mr. L. W. Southerland, Reclamation Economist, from your office visited us and I showed him all our files on the Joseph City artesian wells. The information in my files was concerned principally with that which was secured in 1936, when I made the first trip to the location of the wells. Prior to that time in correspondence with our County Agricultural Agent, Mr. McLernon, at that time, I had advised them to drill a fewer number of wells and go deeper into the Coconino sandstone. However, they had not followed that advice, but had completed the drilling of wells Nos. 0-9, rather closely spaced. Most of these wells were comparatively shallow. At that time a drilling rig was on Well No. 2. The depth of this well was 75 feet. I suggested that they drill at least to a depth of 200 feet, which I believe was done later.

From information which Mr. Southerland had I understand that the present combined flow from the wells is approximately 6 cubic feet per second. This would indicate to me that either additional wells have been drilled, or more probable that the wells have been drilled to greater depths.

At the time I visited Holbrook in 1936 I made a sketch of the location of the wells on which I noted their depths and the approximate discharge of the individual wells. I note in summing the estimate of the individual discharges that the total discharge of flow from the group only amounts to about 600 gallons per minute - 1.33 cubic feet per second.

Well No. 10 which was drilled later, and which was the well Mr. Steenbergen made the pump test on in 1939, has also been located on this sketch, a copy of which is enclosed.

Upon a thorough search through the old files of the Agricultural Extension Service we located what are presumably the original notes made by Mr. Steenbergen on this test. From these notes the following information has been summarized: The pump test was made on December 13-14, 1939, with a horizontal centrifugal pump using tractor power. The suction of the pump was directly connected to the well casing of Well No. 10, and the notes indicate

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that the static water level in the well at that time stood approximately 2-1/2 feet above the ground surface.

The combined discharge from Well No. 10 + Wells Nos. 0-7, inclusive, was measured with a weir installed in the ditch a short distance above Well No. 8. Apparently Well No. 0 was not flowing and Wells Nos. 6 and 7 are described as barely flowing.

The following notations with reference to the pump test on Well No. 10 were taken directly from Mr. Steenbergen's notes:

Pump Test - Well #10 - St. Joseph Irrigation District

Time	Weir dischg cu.ft./sec.	Remarks
12-13-39		
9:00 a.m.	1.68	Combined flow of all wells above weir including Well No. 10
9:15 a.m.		Flow from Well #10 cut off. Static water level about +2.5 ft. ground surface.
9:45 a.m.	1.14	Combined flow of all wells with Well #10 shut off
11:00 a.m.		Pump started on Well #10
11:18 a.m.		Drawdown Well #10 - 18.2 ft.
11:25	4.05	
11:35	4.62	
12:08 p.m.		Drawdown Well #10 - 19.05 ft.
12:48 p.m.	4.56	
2:25		Drawdown Well #10 - 21.6 ft.
2:45	4.86	
4:26		Pump stopped
4:52		Pump started
11:50		Drawdown Well #10 - 20.45 ft.
12:00 a.m.	4.74	
6:30 a.m.		Pump stopped to change tractors
7:10		Started pumping again
10:27	4.74	
10:50		Drawdown Well #10 - 22.2 ft.

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Toward the end of the pump test the notes indicate that Well No. 8 and all the wells above the weir had ceased to flow. It is difficult from the notes to determine just how much effect the pumping of Well No. 10 had upon the water levels in the other wells. It appears that a lowering of 50 inches and 54 inches occurred in wells Nos. 6 and 7 respectively. A lowering in Wells Nos. 4 and 5 of 28 and 24 inches respectively is indicated. Wells Nos. 1, 2 and 3 ceased flowing, but the notes do not show how much below the reference point or ground surface the water level was lowered. Possibly these wells have a greater normal static head above the ground surface than do the other wells.

I shall be much interested in the present situation of this group of wells and also any additional information you have secured relative to pumping from them.

Very truly yours,

H. C. Schwalen
Agricultural Engineer

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cc James C. Armer