

RECEIVED JUL 22 1992

MEMORANDUM

TO: Drennan Park  
FROM: Andrew Wachob  
SUBJECT: Flowmeter Test of BFT-1809 Observation Well  
DATE: July 16, 1992

This memo summarizes my interpretation of the flowmeter logs run in the SCWRC observation well BFT-1809 (27JJ-q02) at Dolphin Head on July 13, 1992. The caliper log referenced in this analysis was made on July 7, 1992 by Joe Gellici. With the pump set at 40 feet and discharging 200 gallons per minute, the flowmeter logs were made for the interval between 100 feet and 700 feet below top of casing, with the log record showing the water speed relative to the probe during both upward and downward probe movement.

Before beginning a quantitative analysis of this flowmeter log, it is important to notice and adjust for a probable discrepancy in the depth scales of the upward and downward logs. It appears that the upward log is shifted about three feet higher than the downward log. An examination of the logs near depths of 250, 265, 300, 330, 395, and 480 feet reveals that features common to both logs appear in the upward log at positions about three feet closer to the surface than they appear in the downward log. While the reason for the offset is uncertain at this time, this discrepancy should not prevent a useful analysis of these logs.

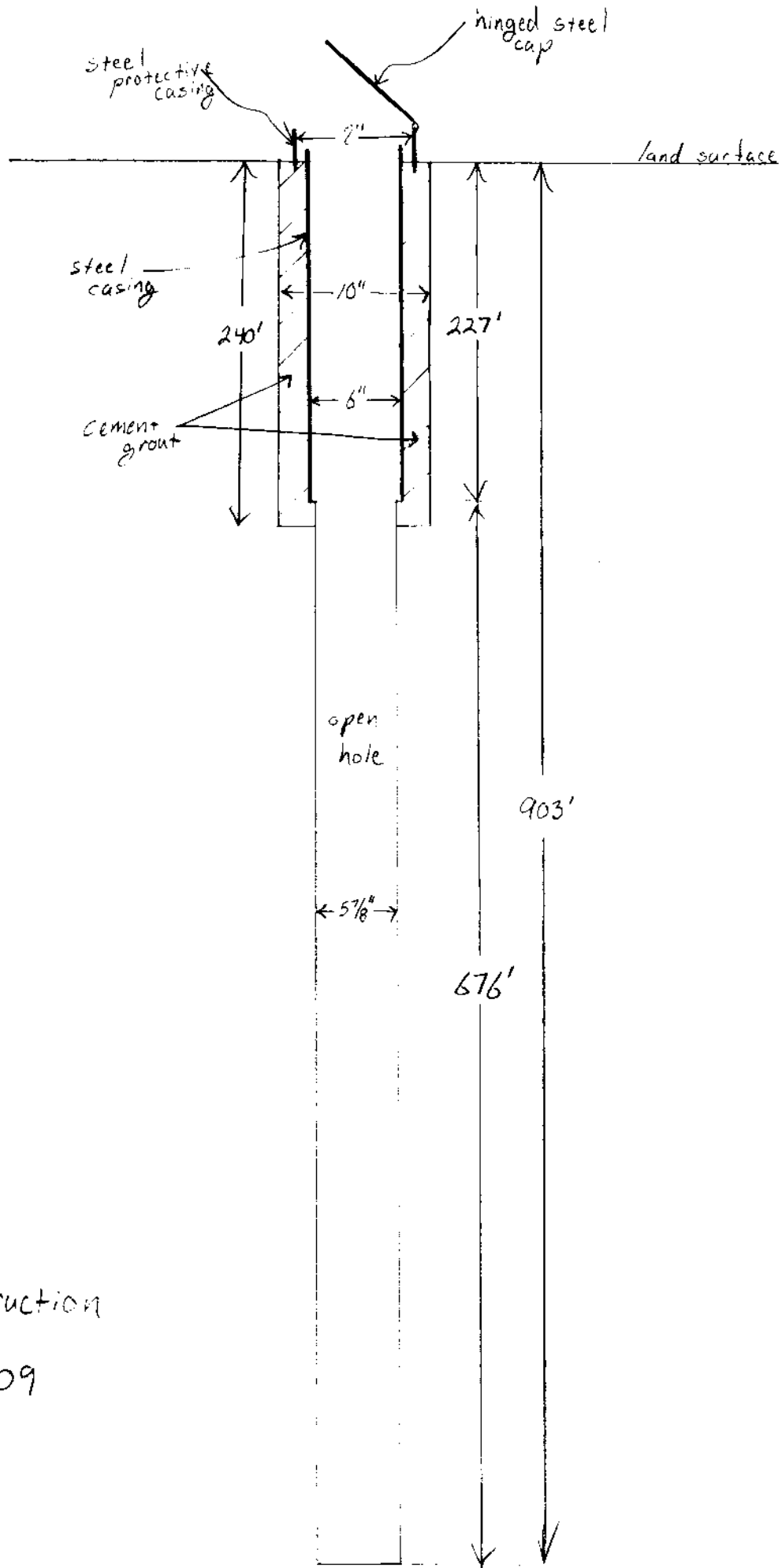
Below 520 feet, both upward and downward logs have essentially the same value, indicating that the water in the well between 520 feet and the bottom of the well is not flowing to any extent measurable with this flowmeter.

Between 520 feet and 510 feet, the two logs begin to show some separation, indicating that water is beginning to flow upwards. By 502 feet, the speed of the water has equaled the upward speed of the flowmeter (20 feet per minute, which corresponds to about 31 gallons per minute), resulting in the upward log showing zero velocity for the water at that depth.

Most of the water being pumped from this well appears to be entering the well from between 514 feet and 484 feet. At 498 feet, the water is flowing at about 60 gpm, by 490 feet, the water is moving at 110 gpm, and by 482 feet, the water is flowing by at about 162 gpm. Calculations of flow in the well indicate that the flow remains at roughly 165 to 175 gallons per minute between 470 feet and 240 feet. Variations in the water speed within this region are due to variations in the well diameter - comparing the flowmeter logs with the caliper log for this well shows a very good correlation.

Between 240 feet and the bottom of the casing, at 228 feet, the hole diameter increases considerably. Water speed slows, but the volume of flow increases in this zone, since inside the casing, the water is flowing at 200 gpm. This zone is difficult to analyze accurately, since the caliper arms extended completely without hitting the side of the well in the uppermost eight feet of open hole, and since the flowmeter probe hung up twice in this zone while logging downhole. However, it seems reasonable to conclude that if about 170 gpm was flowing into this zone from below, and 200 gpm was flowing out of this zone, then about 30 gpm of water is entering the well from the uppermost 12 feet of open hole.

In summary, this flowmeter test has shown that there are two zones within this well which are producing water. The primary zone, contributing about 85% of the water pumped from the well during this test, is located between 484 feet and 510 feet. The remaining water being pumped from from this well is entering the well from just below the casing, between 228 feet and 240 feet.



Well Construction

BFT 1809



# State of South Carolina Water Resources Commission

P.O. Box 4515 / 3830 Forest Drive / Columbia, S.C. 29240 / (803) 758-2514

144 RIBAUT SQ., BEAUFORT, S. C. 29902 - 524-1995



## WATER WELL REPORT

OWNER'S NO.

COUNTY NO.

BFT-1809

SCWRC NO.

273J-q02

**A. GENERAL**

1. Lat-Long: 321603 804322 2. Map: Parris Island 3. Location: Dolphin Head
4. Well use: ps ( ) ind ( ) irr ( ) stk ( ) fire ( ) dom ( ) rec ( ) obs (X) pab ( ) abn ( ) des ( ) unu ( ) stb ( )  
Remarks: Beaufort-Jasper Regional Ground-Water Study Monitor Well.
5. Drainage Basin: 030-0208 6. Topography: draw ( ) hilltop ( ) hillside ( ) valley ( ) flat (X) depression ( )
7. Owner: SCWRC/USGS Phone: 524-1995  
Address: 144 Ribault Square, Beaufort, South Carolina 29902
8. Engineer: \_\_\_\_\_ Phone: \_\_\_\_\_  
Address: \_\_\_\_\_
9. Source of Data: \_\_\_\_\_ Phone: \_\_\_\_\_

**B. WELL CONSTRUCTION DATA**

1. Contractor: C. W. Lusby Drilling Company, Inc. Phone: (806) 792-9422  
Address: 3311-88th Street, Lubbock, Texas 79423
2. Driller: C. W. Lusby 3. Date started: 3/20/86 Completed: 5/9/86 4. Const. Diag.: Yes ( ) No ( )
5. Method Drilled: Mud rotary (X) Cable tool ( ) Augered ( ) Other \_\_\_\_\_
6. Hole Size: Dia(in.): 10" from 0' to 240' Type bit: \_\_\_\_\_ Time: \_\_\_\_\_  
5 7/8" 240' 903'
7. Well Depth (ft.): Rept. 903' Test hole: \_\_\_\_\_ Completed: \_\_\_\_\_ Measured: 890'
8. Method Developed: Pump ( ) Horiz. jet ( ) Air surge (X) Other \_\_\_\_\_ Time: \_\_\_\_\_
9. Drill Mud Type/Brand: Bentonite/Quick Gel Total weight used: \_\_\_\_\_
10. Grout Type: Neat Method: Tremie & Pressure Vol: \_\_\_\_\_ Thick(in.): \_\_\_\_\_ Depth(ft.): 0' to 227'
11. Casing Dia.(in.): 6" Depth: 0' to 227' Wght./ft.: \_\_\_\_\_ Type: Steel Meth. install.: \_\_\_\_\_  
or Wall Thick
12. Screen Record: open hole (X) Remarks: Opens to upper and lower Floridan Aq: Floridan  
Dia.: \_\_\_\_\_ Depth: \_\_\_\_\_ to \_\_\_\_\_ Type: \_\_\_\_\_ Mat.: \_\_\_\_\_ Slot: \_\_\_\_\_ Aq: \_\_\_\_\_  
(in.) (ft.) (in.)
13. Filter: \_\_\_\_\_ Type \_\_\_\_\_ Method: \_\_\_\_\_ Vol: \_\_\_\_\_ Thick(in.): \_\_\_\_\_ Depth(ft.): \_\_\_\_\_ to \_\_\_\_\_
14. Remarks: \_\_\_\_\_