

Aquifer-Test Report for Flowing Stock Well Cottonwood

INTRODUCTION

The U.S. Geological Survey began a water-resources investigation of the Tracy Segment hydrographic area in cooperation with Storey County, Nevada. Part of the investigation was planned to evaluate the distribution and movement of ground water in fractured volcanic rock aquifers. A flowing stock well near Cottonwood Springs and Long Valley Creek (39°22'37" N, 119°34'45" W; figure 1) was selected to estimate transmissivity of one such aquifer. No well drillers' report has been found, but field measurements indicate the well is constructed of 12-inch diameter steel casing with a 6-inch diameter riser, which extends 30.5 inches above land surface. The well is screened between 118 and 138 feet below land surface and is under artesian pressure, approximately 24 feet above land surface.

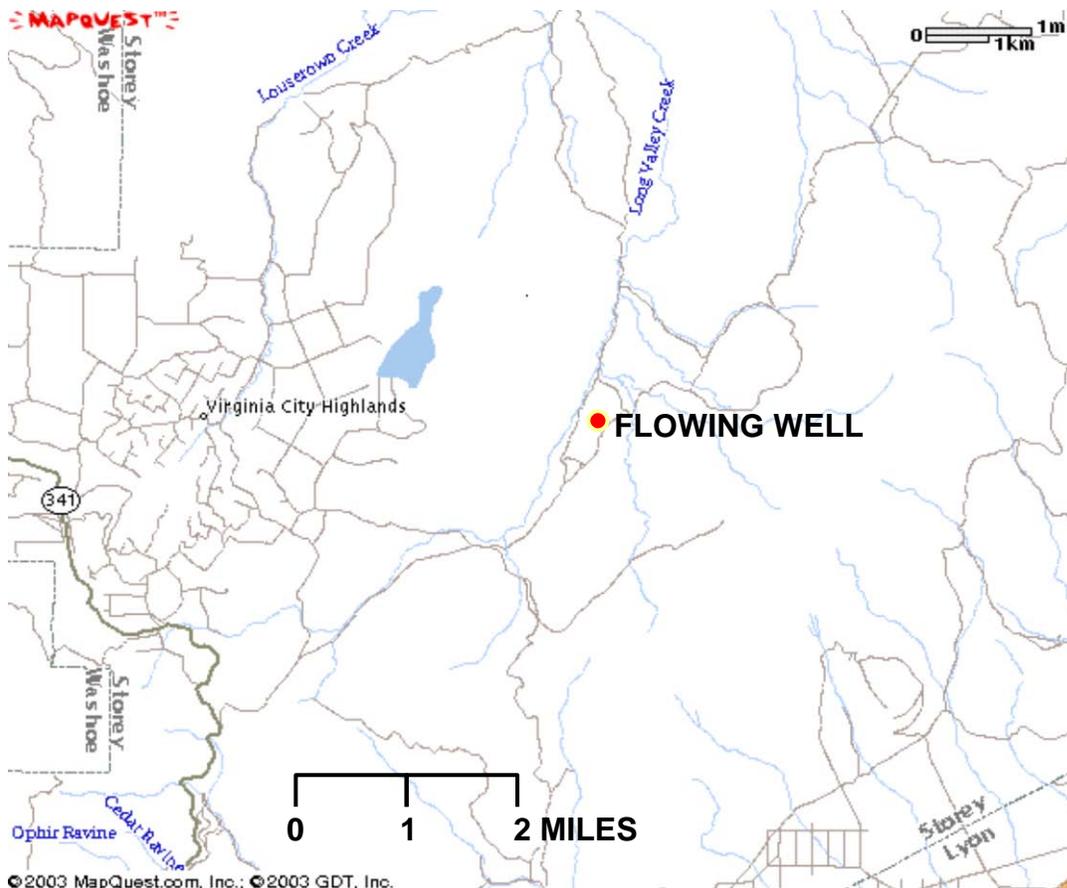


Figure 1.—Location of flowing, Cottonwood well.

TEST DESCRIPTION AND RESULTS

Discharge was measured in a four-foot length of 1.5-inch steel pipe, using a portable flowmeter (Panametrics TransPort™ Model PT868; no endorsement intended). The well was initially capped to allow the pressure to equilibrate at about 20 feet above the discharge line and then a gate valve was opened almost instantaneously to allow water to discharge through the steel pipe and into a 1.5-inch fire hose. Initial discharge was 50 gpm for the first minute of the test. Discharge declined 2 gpm over a twenty-minute period to 48 gpm. The 48-gpm rate of discharge remained constant during three hours of monitoring.

Transmissivity around the Cottonwood well was estimated with constant-drawdown, declining-discharge test (Jacob and Lohman, 1952; figure 2). A specific value could not be estimated because discharge declined 2 gpm from an initial rate of 50 gpm and drawdown in the aquifer could have been less than the measured drawdown of 20 ft. Well construction and constrictions in the discharge line probably result in a less-than-ideal relation between head loss and discharge. Transmissivity was estimated to be between 1,000 and 5,000 ft²/d.

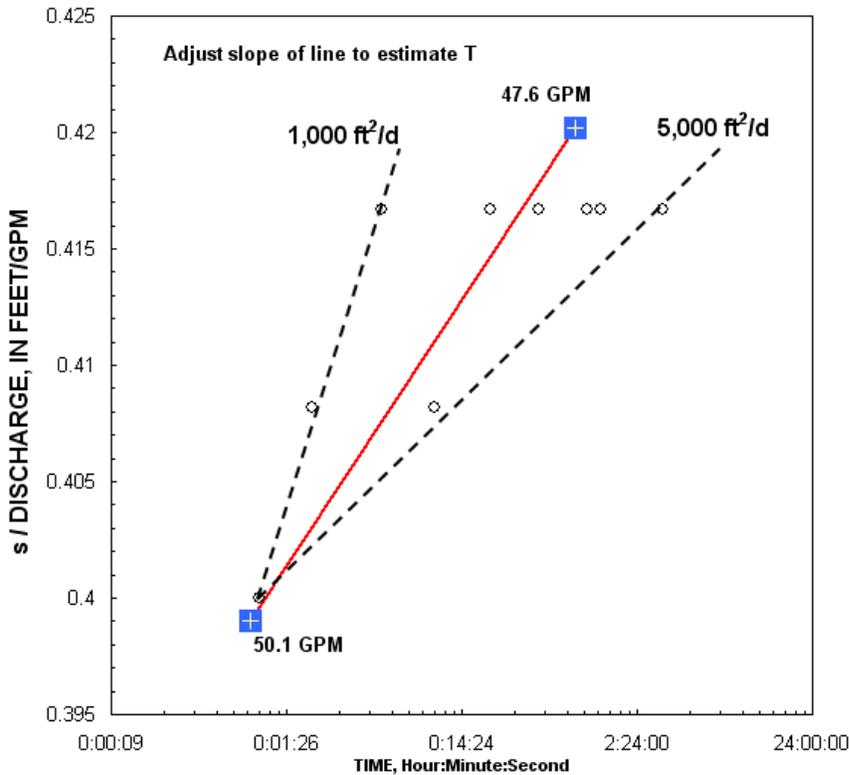


Figure 2.—Range of transmissivity estimates from fitting slope of discharge decline over 3 hours.

Table 1.—Time-discharge observations from Cottonwood Well on 6/17/02.

Day	GPM
10:20	
10:21	50
10:22	49
10:25	48
10:30	49
10:41	48
11:00	48
11:35	48
11:49	48
13:40	48

REFERENCES

- Halford, K.J. and Kuniandy, E.L., 2002, Documentation of spreadsheets for the analysis of aquifer-test and slug-test data: U.S. Geological Survey Open-File Report 02-197, <http://water.usgs.gov/pubs/of/ofr02197/>
- Jacob, C.E. and Lohman, S.W., 1952, Nonsteady flow to a well of constant drawdown in an extensive aquifer: Transaction of the American Geophysical Union, v. 33 (4), 559–569 p.