

Long-Term, Basin-Wide Grande Ronde Aquifer Test

Katie Moran(mora2949@vandals.uidaho.edu) and Jim Osiensky (osiensky@uidaho.edu)

Hydrology Program, Department of Geological Sciences, University of Idaho, P.O. Box 443022, Moscow, ID 83844-3022



BACKGROUND

Annual static water level declines of 0.5-1.5 ft. have been consistently observed in Grande Ronde aquifer system wells since the initial development of this ground water resource in the Palouse Basin. Previous studies have offered conflicting data about the size and groundwater storage capacity of the Grande Ronde aquifer system, the primary water resource in the area. This study hopes to resolve some of the data consistency problems noted by other studies by using standardized data collection equipment and a coordinated approach throughout the basin. In addition, this aquifer test will be conducted over a longer time scale than previous aquifer tests.

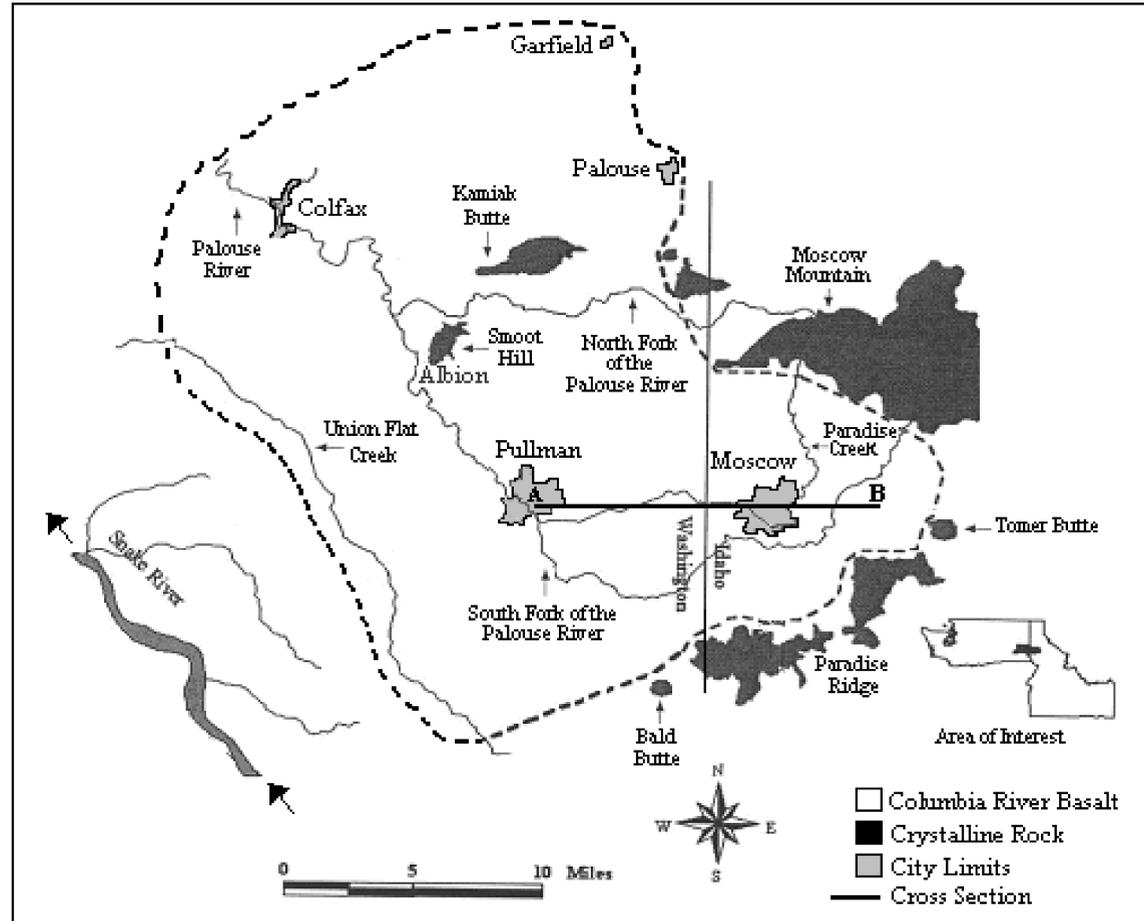
SCOPE AND OBJECTIVES

SCOPE

- Who is involved?** All of the major municipal pumping entities in the basin - Moscow, Pullman, UI, WSU, Colfax, and Palouse - are participating in this aquifer test.
- What types of data are we collecting?** A network of Leveloggers™ (for water-level measurements) and HOBOS™ (pump on/off) will record data at standardized intervals for the duration of the test.
- How long will this test run?** This aquifer test will begin around November 25, 2009, and continue for approximately one year.

OBJECTIVES

- **What do we hope to learn?**
 - Short-term and long-term aquifer storativity (storage capacity)**
The start of this aquifer test requires all significant Grande Ronde pumping to cease at a coordinated time for as long as possible, to allow as much water level recovery to static levels as possible. Short-term changes from static levels will lead to a calculated short-term storativity; data collected over the remainder of the year-long test will delineate the long-term storativity. Accurate storativity estimates are required for water budget-based calculations within the basin.
 - Well connections** – Past research and aquifer tests have revealed hydraulic connections among subsets of Grande Ronde wells. This test should confirm known connections as well as delineate previously unknown connections among specific wells.
 - Basin size** – Calculated basin storativity, combined with pumping amounts and drawdown data, will allow the estimation of total basin size and aquifer extent.



DATA COLLECTION

LEVELLOGGERS

- Solinst and Schlumberger in-situ pressure transducers collect water level data. These devices are suspended in monitoring wells below the water level.
- Solinst Barologgers collect atmospheric barometric data in order to differentiate water level changes by pumping from atmospheric pressure effects.
- Loggers are programmed to record measurements at selected intervals to ensure synchronized data.



Onset HOB0 Motor On/Off Loggers

- Self-contained, battery-operated units mounted with velcro or magnets onto well pump housing or wiring
- Records on/off state changes
- Are/will be installed on municipal pumps to record consistent data for on/off cycling of all large-volume groundwater pumps within the basin



METHOD

The methodology for a multiple-well, variable-pumping-rate aquifer test has been under development for the past several years in the Palouse Basin (McVay, 2007; Fiedler, 2008; Bennett, 2008; Osiensky, 2007). Collection of standardized water level and pumping data throughout the basin will enable the analysis of hydraulic effects of long-term pumping (broken into discrete on/off intervals for each spatially distinct pumping well) as a single, comprehensive data set.

ACKNOWLEDGEMENTS

We would like to thank PBAC for funding this project and providing equipment and knowledge, and Latah County, Washington Department of Ecology, and PBAC for the network of Grande Ronde data loggers. Thanks also to all municipal well operators and private well owners for their cooperation - this test would not be possible without their help.

