

Mosier Ground-Water Project Update

Mosier Watershed Council Meeting, December 8, 2005

Stream Flow Monitoring

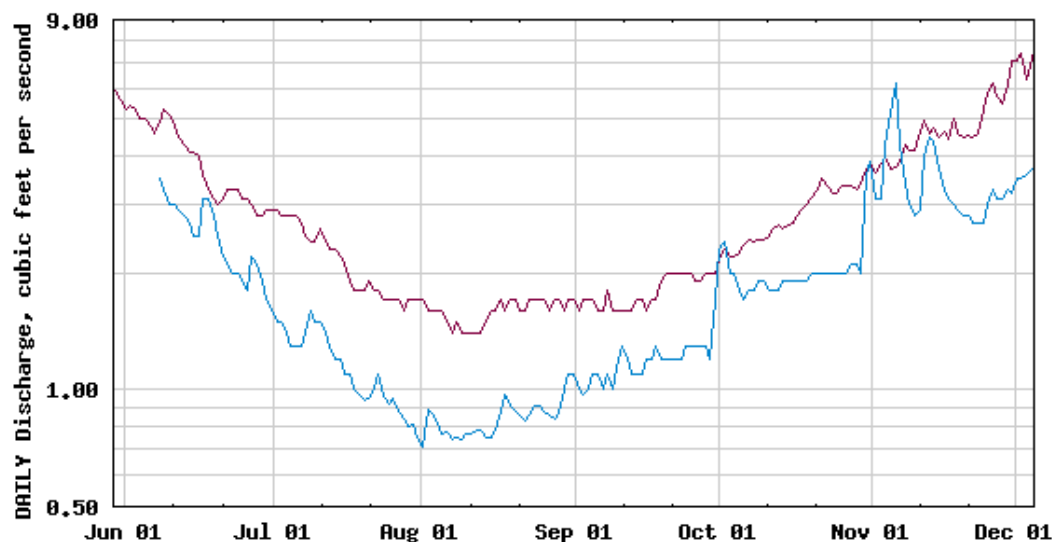
Goals: (1) Monitor flow at Mosier Creek gaging station to evaluate how flows have changed since 1963-81 period when gage was last in operation. (2) Measure flows at other sites on Mosier Creek to determine where ground-water enters or surface-water leaves the creek. Evaluate seasonal and long-term changes since 1962 and 1986 when last measurements were made.

Progress: The stream gage has been back in operation since June 7. Average monthly flows during July through September 2005 were about 1 cfs (cubic foot per second), slightly more than half of the long-term (1963-81) monthly average. Another round of gain-loss measurements were made at 10 sites on Mosier Creek in September. The results showed that Mosier Creek lost about 0.3 cfs (approximately 130 gallons per minute) downstream of the West Fork, compared to a gain of about 0.3 cfs in 1962 and 1986.

Plans: Operate the gaging station and make more gain-loss measurements in 2006. We will be analyzing the 1963-81 streamflow and climate data to assess trends and to make comparisons new data collected in the project.



USGS 14113200 MOSIER CREEK NEAR MOSIER, OR



----- EXPLANATION -----
 ——— MEDIAN DAILY STREAMFLOW BASED ON 18 YEARS OF RECORD
 ——— DAILY MEAN DISCHARGE

Well logging

Goals: 1) Collect information on geology and water-bearing properties of aquifers, 2) measure leakage through boreholes of comingling wells.

Progress: Video log run on Root (old Francois) well where pump was pulled so a water level recorder could be installed. A video log was re-run on the Frost well because the OWRD camera malfunctioned when the first log was run in March. Time was spent searching for candidate wells in the lower valley to log. There are fewer candidates than expected because ground-water levels in the Priest Rapids aquifer have dropped below the top of the unit over a large area.

Plans: We are planning to run a full set of logs to estimate co-mingling flow in Mosier City well no. 3 when it is offline for repair in February-March. We are planning to run logs in at least one other well that we have identified in the lower valley, but must first determine if an alternative source of water can be used to temporarily supply 2-3 homes that are connected to the well.

Ground-Water Level Monitoring

Goal: Monitor water levels in wells to evaluate changes over times scales ranging from hours to decades. These measurements will help understand the effects of climate, development and other factors on the ground-water resource.

Progress:

- 1 new well (Root) instrumented with continuous recorder measuring ground water levels and temperature. There are now 4 recorder wells operated by USGS and 1 well operated by OWRD in the valley. The Hudson and Evans wells recovered 7-8 feet between late August and mid-October (see attached hydrographs) following the end of major irrigation. The Burbank well, located on 7-Mile Hill, declined only about 2 feet during this period—probably due to seasonally low recharge rather than pumping.
- 22 wells measured bimonthly (October, December). 4 additional wells measured quarterly by OWRD.
- We have identified more than 50 wells that were measured at least once by OWRD in the 1984-87 period. We will add about 10 of these wells to the bimonthly network. The remainder will be measured during spring and fall “synoptic” measurements in 2006.

Plans: Make bi-monthly measurements (next one is in February). Make a spring synoptic measurement in April. We will measure about 50-70 wells in a period of 4-5 days to get a “snapshot” of the water level throughout the valley. From these data we will make maps of the water-table surface. We will also be adding a ground-water data page to the project web page (http://or.water.usgs.gov/projs_dir/mosier/index.html). This page will feature a clickable map for viewing hydrographs for all of the wells where we are currently monitoring.

Geologic Framework

Goal: Construct a three-dimensional geologic representation of the aquifer system in the Mosier Valley. The representation will be constructed by mapping the extent, thickness and properties of the basalt aquifers and other geologic units. This framework will be put into the ground-water simulation model.

Progress: We have begun compiling a geologic map that covers the entire Mosier Creek basin. We are using existing maps from studies by Lite and Grondin (OWRD), Keinle (Northwest Geological Services), and Swanson (USGS). The two most detailed maps have been digitized into the project GIS.

Plans: We will complete the map compilation and then begin constructing cross-sections through the area using the map in conjunction with geologic data from wells.

Estimate Ground-Water Pumping

Goals: Estimate an important part of the overall ground-water budget, pumping from wells.

Progress: A preliminary work plan for estimating current (2006) and historical ground-water pumping for irrigation has been developed. (See handout). A field visit was made to inspect the types of pumping and irrigation equipment used in the valley. Monitoring equipment, including running-time totalizers and flow meters, has been procured for use in the field data collection program planned for the 2006 irrigation season.

Plans: Complete the work plan. Interview growers to collect data needed to estimate historical pumping and obtain permission to monitor pumping in 2006. Begin installation of monitoring equipment.