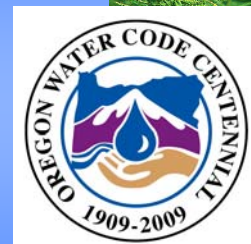
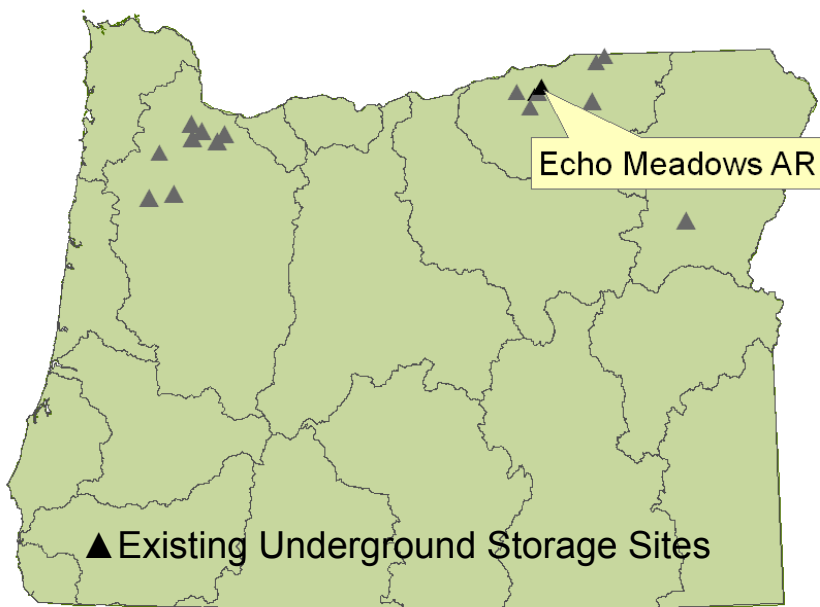




## Oregon Underground Storage: Echo Meadows AR



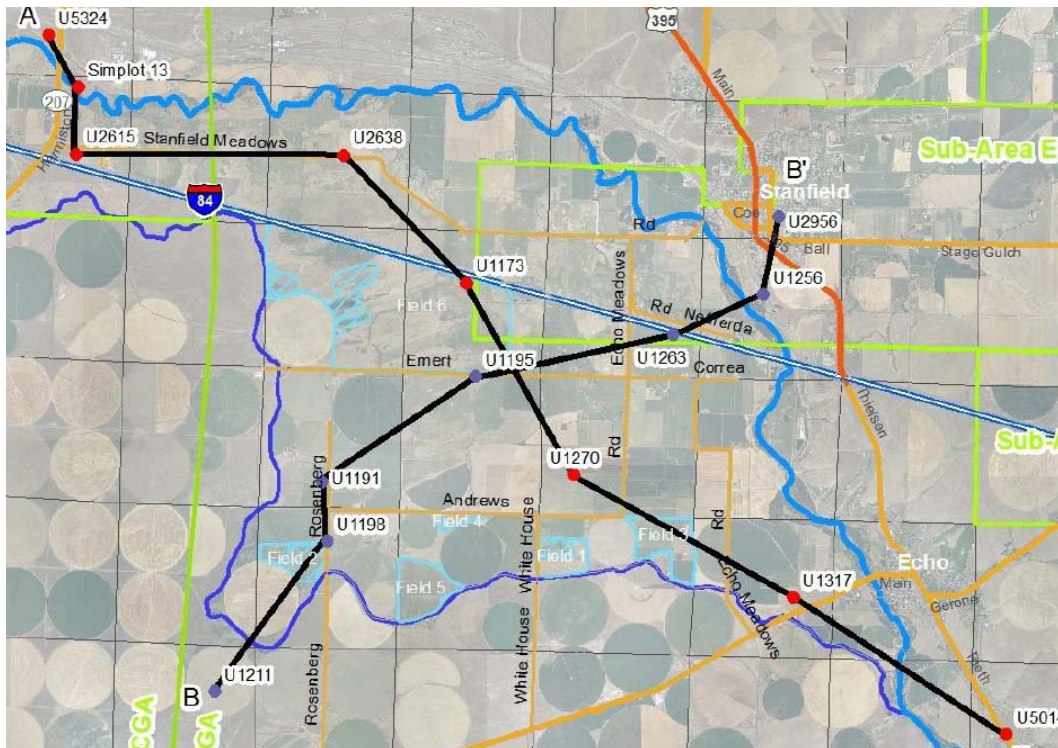
- Echo Meadows is a historic wetland located outside of Hermiston, Oregon. Selected agricultural fields are dedicated to shallow aquifer recharge by surface spreading during winter months.



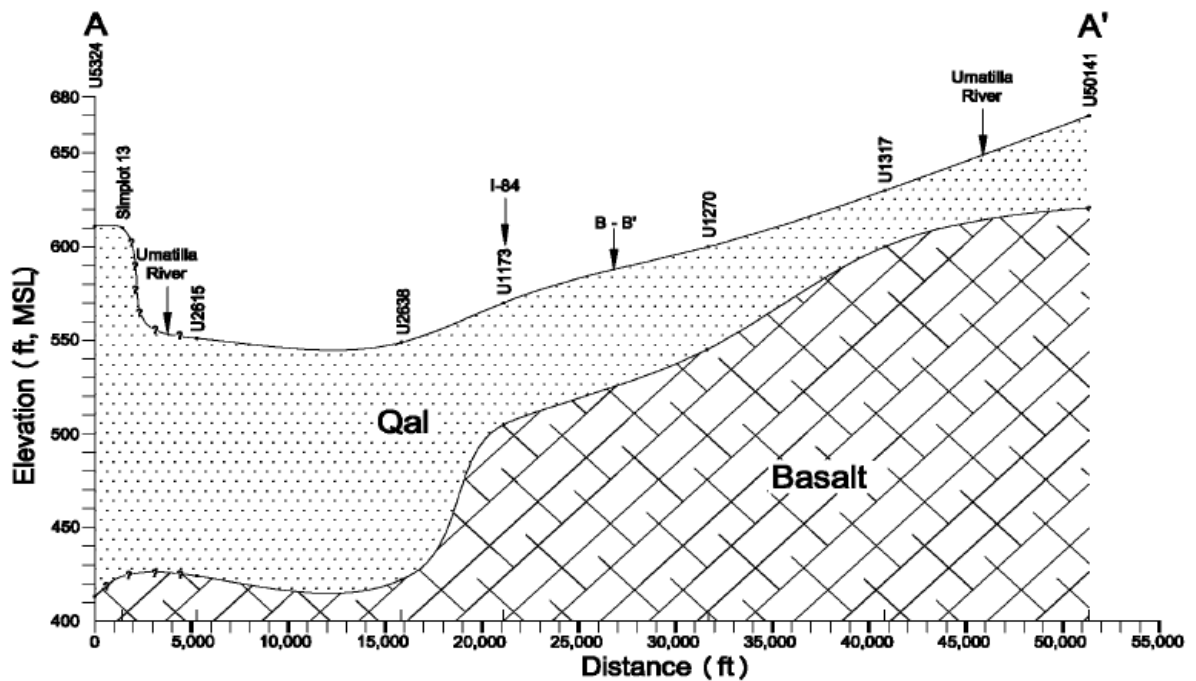
- The site obtained an aquifer recharge limited license in 1997 for stream flow enhancement, which was reissued in 2002, and subsequently expired. The project acquired a new limited license to test and monitor AR in 2008, as part of the Governor's Umatilla Basin Aquifer Recovery Initiative (HB 1069).



- **Source Water:** The Umatilla River provides recharge water during high flow winter months, when permit-specific minimum stream flow rates are satisfied.



Location of geologic cross-sections of Echo Meadows AR site (IRZ, 2008).



#### Legend

- Qal RECENT ALLUVIUM
- UNDIFFERENTIATED BASALT

Note: All distances and elevations are approximate.

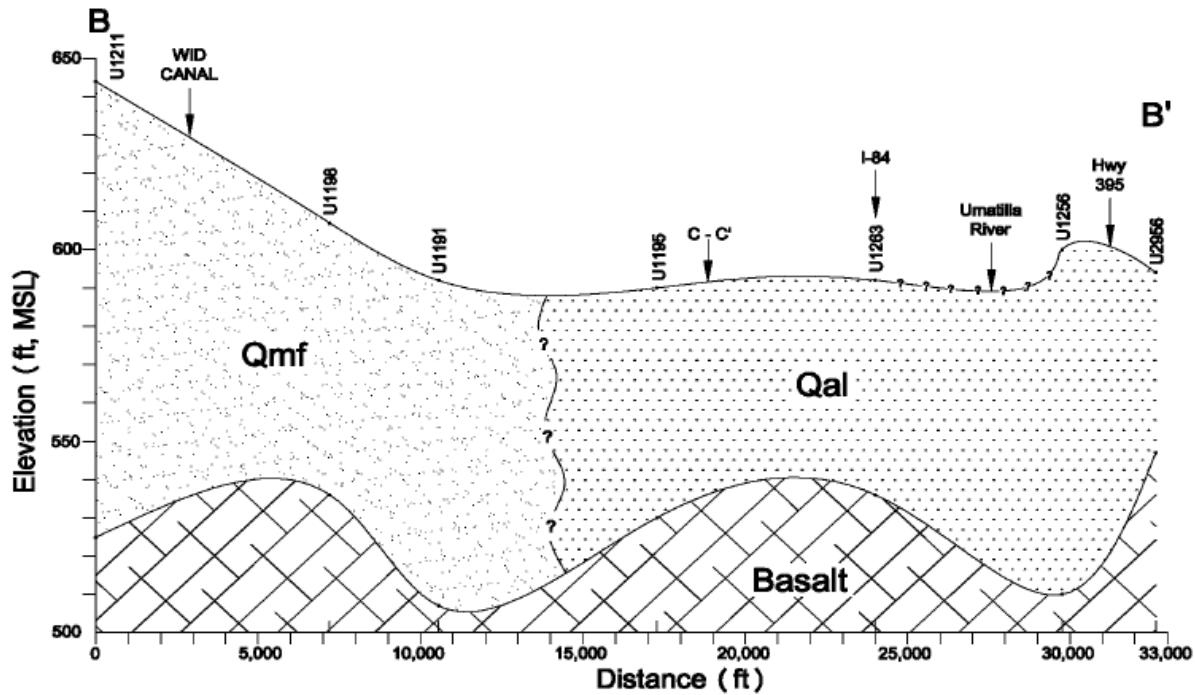
Generalized Cross-Section A-A'  
Echo Meadows Area  
Figure 1.x

Umatilla Recharge Project






Conceptual model of geology at Echo Meadows, cross-section A-A' (IRZ, 2008).





#### Legend

-  Qmf MISSOULA FLOOD DEPOSITS  
(Includes surficial loess Qe in places)
-  Qal RECENT ALLUVIUM
-  UNDIFFERENTIATED BASALT

Note: All distances and elevations are approximate.

Generalized Cross-Section B-B'  
Echo Meadows Area  
Figure 1.x

Umatilla Recharge Project



Conceptual model of geology at Echo Meadows, cross-section B-B' (IRZ, 2008).

- **Aquifer:** Sediments of varying permeability underlie Echo Meadows. Groundwater flows northwest toward the Umatilla River, and recharge is expected to increase water levels at alluvial wells and discharge to the river.
- **AR:** Testing under the most recent AR limited license began in March of 2008 and continued as water availability allowed through the end of May. An estimated 600 acre-feet infiltrated during this time. Water quality and water level monitoring occur down gradient from the recharge to estimate groundwater travel time and paths, and geologic characterization is underway (as of November, 2008).