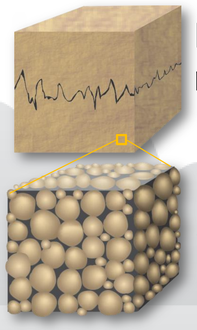
Groundwater Flow at SSFL

1 **Virtually all groundwater storage occurs in the matrix**



Fracture Voids = 0.01 % of rock volume

Matrix Voids = 13 % of rock volume

$$R = P - E_t - F$$

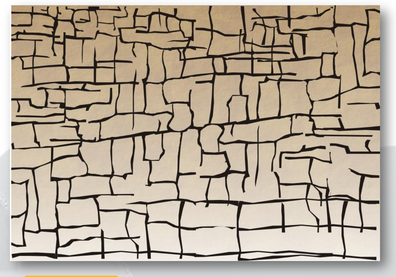
R = Recharge

P = Precipitation

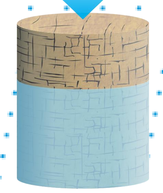
Et = Evapotranspiration

F = Runoff

3 **Flow is dominated by interconnected fractures:**



4 **Resistance to Flow is substantial:**

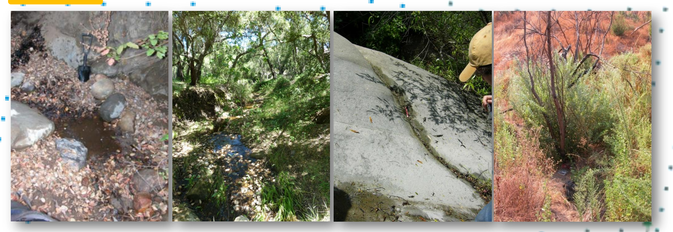


Bulk Hydraulic Conductivity = 0.00001 cm/s

Volume of Water Entering and Leaving the Mountain is small

P 18 inches/year

2 **Some Groundwater Discharges to seeps on hill slopes**



More than 150 seeps and phreatophyte areas have been identified around the site

R

E_t

F

Water Table

Recharge = Discharge = 200gpm

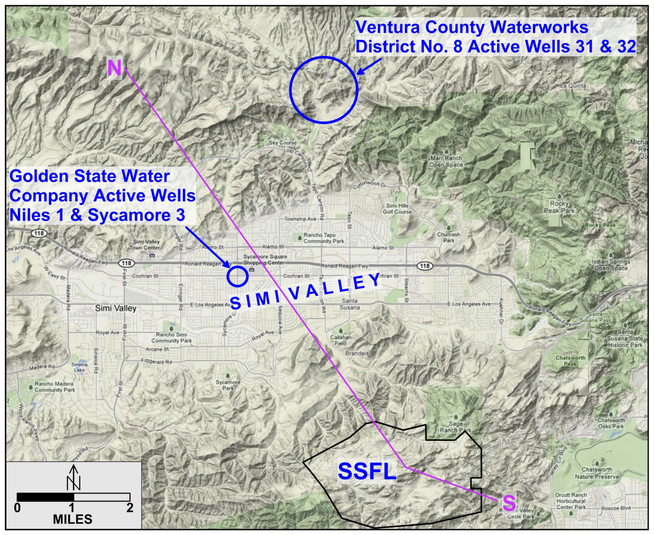
Mountain water table stands hundreds of feet above surrounding valleys

Deep groundwater flow discharges beyond mountain

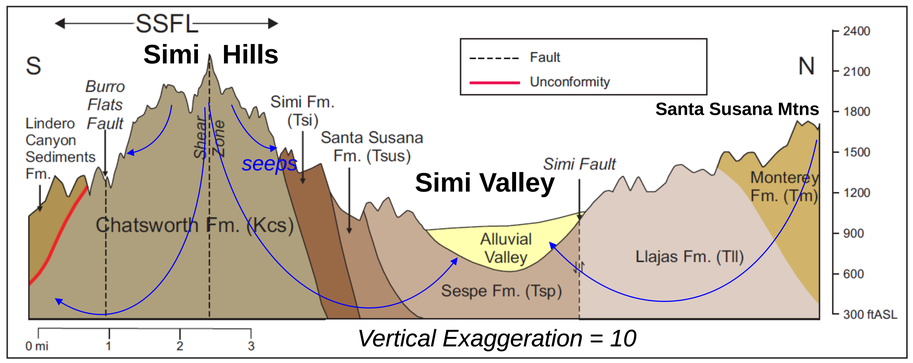
Poster Prepared by Kristina Small, G360 June 24th 2011

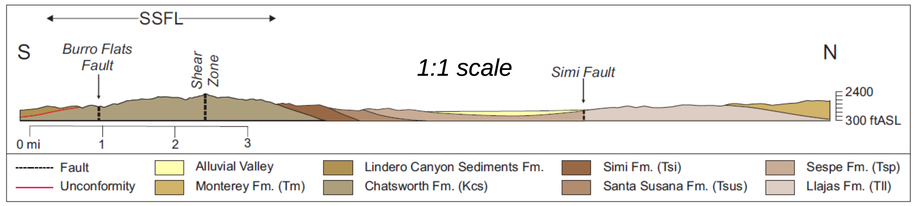
Simi Valley Water Supply and Groundwater Basin

The alluvial aquifer underlying the 19-square-mile Simi Valley has a maximum thickness of ~700 feet with well yields averaging 400 gallons per minute of typically high-mineral groundwater (California Department of Water Resources, Bulletin 118, 2004).

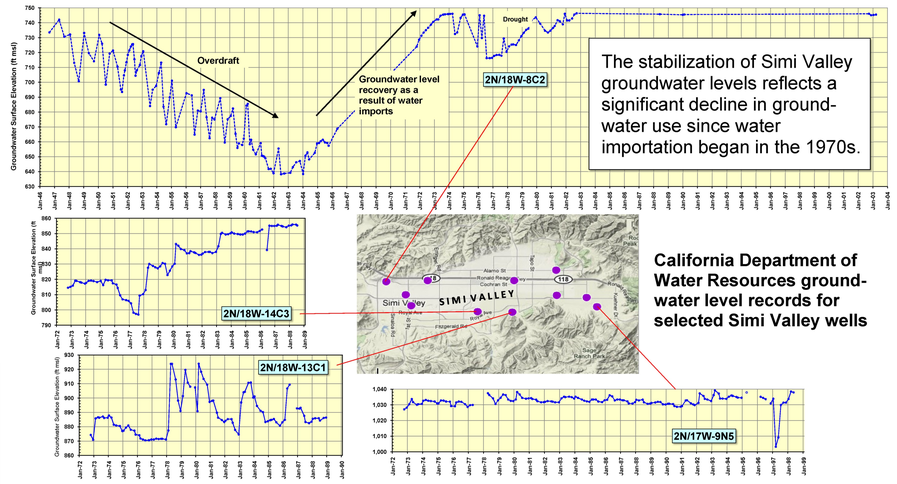


There are currently 4 active municipal wells in Simi Valley. The water must be treated and/or blended because of high mineral content.





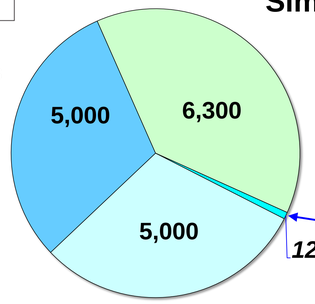
Simulations using a 3-D groundwater flow model indicate that groundwater recharged at SSFL is split roughly equally between discharge to hillside seeps and deep flow into the surrounding valleys (Appendix 6-A of the SSFL Groundwater RI Report).



The stabilization of Simi Valley groundwater levels reflects a significant decline in groundwater use since water importation began in the 1970s.

California Department of Water Resources groundwater level records for selected Simi Valley wells

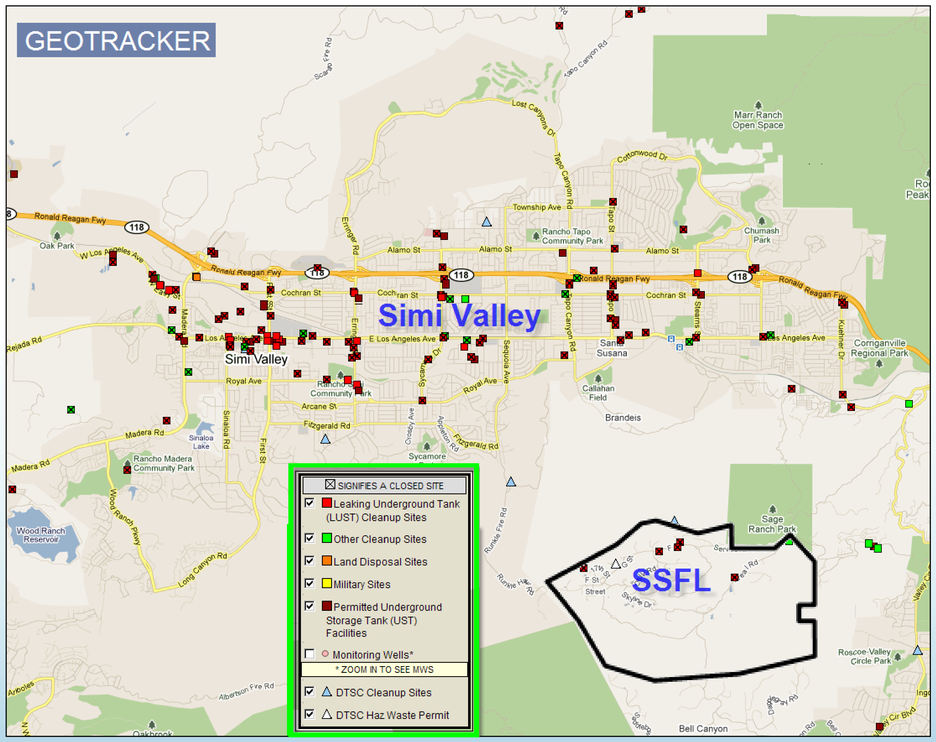
Simi Valley Estimated Average Sources of Groundwater Recharge (acre-feet/year)



- Valley floor recharge of local rainfall and runoff
- Mountain front recharge of local rainfall and runoff
- "Return flows" (20% of delivered water)
- *SSFL recharge that flows into basin*

Groundwater flow from SSFL is estimated to account for less than 1% of Simi basin recharge.

Estimates consistent with water balance factors adopted from *San Fernando Basin Groundwater Model Documentation* (USEPA,1994).



Actual and potential sources of groundwater contamination have been documented across Simi Valley (geotracker.swrcb.ca.gov).

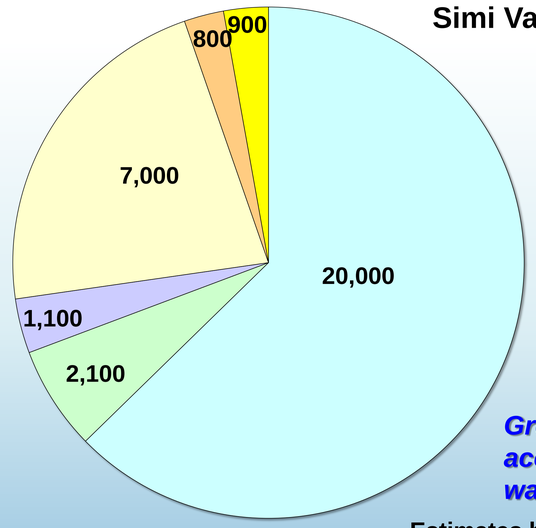
"With a TDS concentration of 1,580 mg/l, the quality of the groundwater is considered unsuitable for many municipal uses"

"Simi Valley's groundwater supply has been identified as impaired due to the presence of high levels of TDS and high chloride and nitrate concentrations, largely due to urban development and past agricultural activities"

"The quality of groundwater has had some challenges with volatile organic compounds (VOCs) in shallower portions of the basin"

Simi Valley General Plan Update Technical Background Report (2007)

Simi Valley Estimated Average Water Supply (acre-feet/year)



- Calleguas Water District imported surface water for Ventura Co. Waterworks District No. 8
- Calleguas Water District imported groundwater for Ventura Co. Waterworks District No. 8
- Ventura Co. Waterworks District No. 8 locally pumped groundwater
- Calleguas Water District imported surface water for Golden State Water Company
- Calleguas Water District imported groundwater for Golden State Water Company
- Golden State Water Company locally pumped groundwater

Groundwater flow from SSFL is estimated to account for less than 1/2 of 1% of Simi Valley water supplies.

Estimates based on annual reports, documents, and data from water purveyors and county and state agencies.

6/24/2011