

SHALLOW WELLS & STREAMFLOW

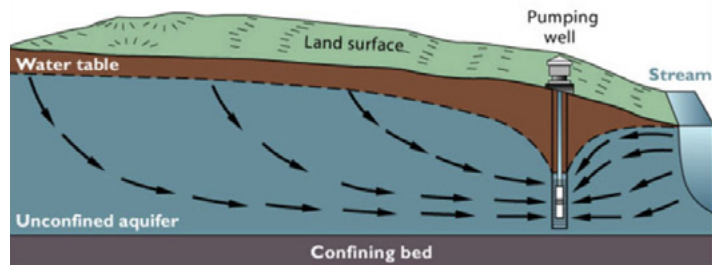
What You Need to Know!

INTRODUCTION

Groundwater is a major water source for many Californians. In addition to being one of the primary sources of agricultural water use throughout the state, approximately 33 million Californians, including most rural inhabitants, use groundwater for drinking or residential uses. Additionally, California contains many Groundwater Dependent Ecosystems -- important plant or animal communities that require groundwater to meet some or all of their water needs. Unsustainable groundwater use (i.e., pumping more groundwater than what is replenished) can not only lower groundwater levels, requiring deeper wells and higher pumping costs for landowners, but can also degrade important groundwater-dependent habitat supporting imperiled plants, animals, and fish. One specific mechanism through which these impacts materialize is via streamflow depletion caused by groundwater pumping of shallow, near-stream wells.

HOW SHALLOW NEAR-STREAM WELLS IMPACT STREAMFLOW

Groundwater and surface water (e.g., creeks, rivers, wetlands) in California are often hydraulically connected, and the use of one source can impact the other. For instance, high winter streamflows sink through the streambed and banks to recharge groundwater reserves, while during the summer dry period, stored groundwater plays an important ecological role by augmenting naturally low streamflow as it emerges back into the stream. Groundwater pumping can capture groundwater that would have augmented streamflow, or capture the streamflow directly, especially where shallow groundwater wells are located close to streams. Both situations will lower streamflow during summer months. Due to the generally slow pace by which water moves through the ground, pumping from deeper, more distant wells is less likely to produce these direct, rapid impacts on streamflow.



NOAA
FISHERIES





THINGS TO CONSIDER BEFORE DRILLING A WELL

All well construction requires a county permit. However, if your well is shallow and located near a waterway, other regulatory requirements may come into play. For example, you may need to notify and obtain a streambed alteration agreement from the California Department of Fish and Wildlife under Fish and Game Code section 1602 before constructing a well if the well will be located in or deplete the surface flow of a river or stream. Shallow, near stream wells may also require a valid water right if they are directly capturing surface water or the subterranean portion of a stream.

HOW YOU CAN HELP

There are several things landowners can do to minimize the impact of their well pumping on streams and rivers.

- **Pump during times when others are not pumping (e.g., night):** Because the timing between pumping from a shallow, near-stream well and resultant surface flow depletion can be brief (e.g., minutes to hours in some cases), the impact can be cumulatively significant if numerous landowners pump at the same time. Staggering pumping times among neighbors

can minimize or avoid streamflow depletion impacts. Adding a storage tank to your well system can help ensure you have adequate water when you need it.

- **Regularly inspect your well system:** Inspect your well system periodically to ensure that the system has adequate pressure and amperage, valves are opening and closing as designed, there is no buildup of debris, and the system does not have any leaks. Restoring a system to good working order will increase its water use efficiency, and noticeably decrease electricity costs
- **Pump and store water during winter high flows:** In California's Mediterranean climate, much of our precipitation occurs between October and April. Capturing (or pumping) water during winter and storing it for later use can help alleviate the strain caused by groundwater pumping on naturally low summer streamflows.
- **Consult with a hydrogeologist to relocate an existing well, or site future wells, a suitable distance from streams and rivers.** As stated earlier, the degree of streamflow depletion is largely governed by the wells' depth and distance from the stream, as well as the existing on-site geology. Landowners should work with a knowledgeable professional to ensure their existing well, or proposed new well, is sited an appropriate distance from any waterway.



Please visit the State Water Board's Drought webpage at www.waterboards.ca.gov/drought for more information.