

At Risk: Public Supply Well Vulnerability Under California's Sustainable Groundwater Management Act

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EXECUTIVE SUMMARY

ommunity water systems in the San Joaquin Valley face a host of challenges that threaten the safety and reliability of drinking water, including pollution, periodic drought, and chronic groundwater overdraft. About 20% of community water systems in the region currently have water quality violations (SWRCB 2021a). Hundreds more are at risk of failing to provide safe drinking water (Henrie et al. 2021). Moreover, shallow wells, some of which serve community water systems, are vulnerable to shortterm and chronic declines in groundwater levels. For example, during the 2012-2016 drought, many domestic wells and some public supply wells went dry.

To that end, the state's Sustainable Groundwater Management Act was designed to prevent—among other undesirable effects—significant and unreasonable chronic lowering of groundwater levels, which would impact beneficial users of groundwater, including water systems reliant on shallow groundwater wells. Yet implementation thus far, which occurs at the local level, often does not account for shallow well protection. This threatens the realization of California's Human Right to Water, passed in 2012, which states that "every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes." (California Water Code §106.3, Chaptered 2012).

Vulnerability to declining groundwater levels is most acute for communities in critically overdrafted basins. Underfunded local agencies, poor representation of disadvantaged communities, historical groundwater overdraft, and the potential for increasingly severe droughts driven by climate change all challenge the ability of groundwater sustainability agencies to support the Human Right to Water and protect the health and security of groundwater reliant residents, particularly in rural areas.

Numerous studies have documented the impact of submitted Groundwater Sustainability Plans and groundwater decline on shallow domestic wells (Perrone and Jasechko 2017; Gailey, Lund, and Medellín-Azuara 2019; R. A. Pauloo et al. 2020; Water Foundation 2020; Bostic et al. 2020). However, none have explored impacts to public supply wells. This report examines the potential impacts of submitted Groundwater Sustainability Plans on public drinking water supply wells. Results inform the Department of Water Resources' Sustainable Groundwater Management Act review efforts and the final plans approved by Groundwater Sustainability Agencies with quantitative evidence of the likely impacts and financial costs of minimum thresholds on public supply wells.

This report focuses on the San Joaquin Valley, due to its social and economic significance, high concentration of water-related challenges, and the availability of developed Groundwater Sustainability Plans. Across the San Joaquin Valley, the average minimum threshold is 100 feet below the average 2019 water level (R. Pauloo et al. 2021). Declines of this magnitude are likely to have detrimental impacts on shallow public supply wells and costly rehabilitation or replacement to continue operating effectively.

We find that 503 of the 1,200 public supply wells, or 42%, are likely to be partially or fully dry at minimum thresholds established in these sustainability plans.

Of the Groundwater Sustainability Plans that have public supply wells within their boundaries, all have at least one public supply well that would be partially or fully dewatered at minimum threshold groundwater levels. Each Groundwater Sustainability Plan would impact 16 wells and 5 water systems, on average. Furthermore, about 70% of water systems in all plans will have at least one well that could be partially or fully dewatered at minimum thresholds. Nearly 120 water systems, serving 1.35 million people, will face more severe challenges, with over 30% of each system's wells impacted. Small water systems and water systems serving populations whose households make less than \$75,000 per year are more likely to face severe impacts.

Yet some solutions are available. Consolidation between small water systems with chronic water quality challenges and large water systems that meet water quality standards can support water quality and quantity vulnerabilities. Nearly 20% of small, underperforming system wells will be fully dewatered at minimum thresholds, while only 10% of large, highperforming water system wells are likely to experience full dewatering. However, this analysis does not include domestic well users nor groundwater-dependent state small water systems, including those in Disadvantaged Unincorporated Communities that fall outside of community water systems, where there are often dense groupings of domestic wells (London et al. 2018). These communities should be involved in discussions of nearby consolidation as they too are vulnerable to changes in groundwater quantity and quality.

As a result of the vulnerability of public supply wells, water systems, and their customers reflected in this analysis, we recommend the Department of Water Resources examines how Groundwater Sustainability Plans consider the Human Right to Water in their minimum thresholds and mitigation plans. Furthermore, Groundwater Sustainability Agencies need to prepare to support small systems and domestic wells with additional data collection on who is vulnerable, robust mitigation frameworks, support in searching for alternative water supplies, and consolidation efforts. Finally, data and methods for assessing the impacts of a range of minimum threshold options on groundwater wells should be made accessible through a centralized, standardized, and publicly available format.





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