

**Evaluation of Bi-State Remediation Alternatives
for Mitigation of Low Stream Flows
Induced by Surface-Groundwater Interaction**

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ABSTRACT

Interactions between surface water and groundwater are of growing importance as the effects of increased groundwater withdrawals on stream flows during critical low-flow periods are becoming more pronounced. Conjunctive management of both sources requires sophisticated spatial and temporal analysis. In situations involving multiple jurisdictions such as state boundaries, management problems are magnified due to often conflicting regulations and policies. A transient MODFLOW model of the Spokane Valley-Rathdrum Prairie (SVRP) aquifer/river system mutually accepted by both the States of Idaho and Washington was used in this study to evaluate regional solutions to potential water shortages through the use of strategically placed infiltration basins or injection wells. Artificial recharge of the SVRP aquifer was simulated using diversions from Lake Pend Oreille during winter periods when flows are high and excess water is potentially available. Alternative locations for potential wells and detention basins were examined. Lag times for the water to impact stream/groundwater interaction areas along the Spokane River were evaluated to assess the potential for augmenting stream flows from July through September. Results indicated that the aquifer could be used to improve low-flow season stream flow values utilizing both infiltration basins and injection wells with winter surface water diversions. Depending on the location, as much as 30% of the winter diversion rate could be lagged to improve summer flows at the Spokane gage. Thus, a regional mitigation strategy is scientifically feasible.