

Water Master Plan

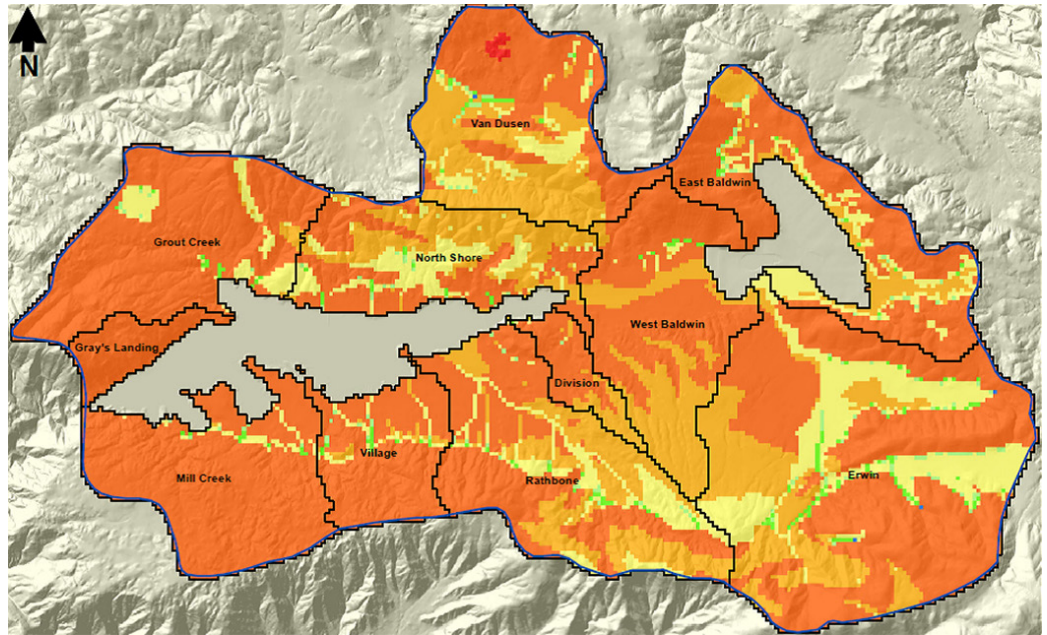
Big Bear City, California

Client

Big Bear City Community Services District

Highlights

- ◆ Performed water master planning
- ◆ Developed detailed water system hydraulic computer model
- ◆ Articulated 20-year Capital Improvement Program
- ◆ Evaluated groundwater recharge and safe yield
- ◆ Used basin-wide soil-water balance analysis method
- ◆ Prepared drought contingency plan
- ◆ Presented master plan at Board of Directors meeting
- ◆ Developed groundwater supply management and forecasting tools



Modeled spatial distribution of recharge with the Big Bear Valley Watershed

DBS&A led a hydrogeologic and engineering team to perform water master planning for the Community Services District of Big Bear City, California. The District required an update to its water master plan that would accommodate steady growth and proactively plan for future water supply needs.

The water master plan included analysis of population and water use trends, sources of water supply, and the operations of the existing water system. DBS&A's team also developed a detailed water system hydraulic computer model that was used to analyze the strengths and weaknesses of the existing water system and proposed system improvements. The plan also articulated a Capital Improvement Program that described and estimated the cost of the infrastructure needed to provide adequate water supplies during the 20-year planning horizon.

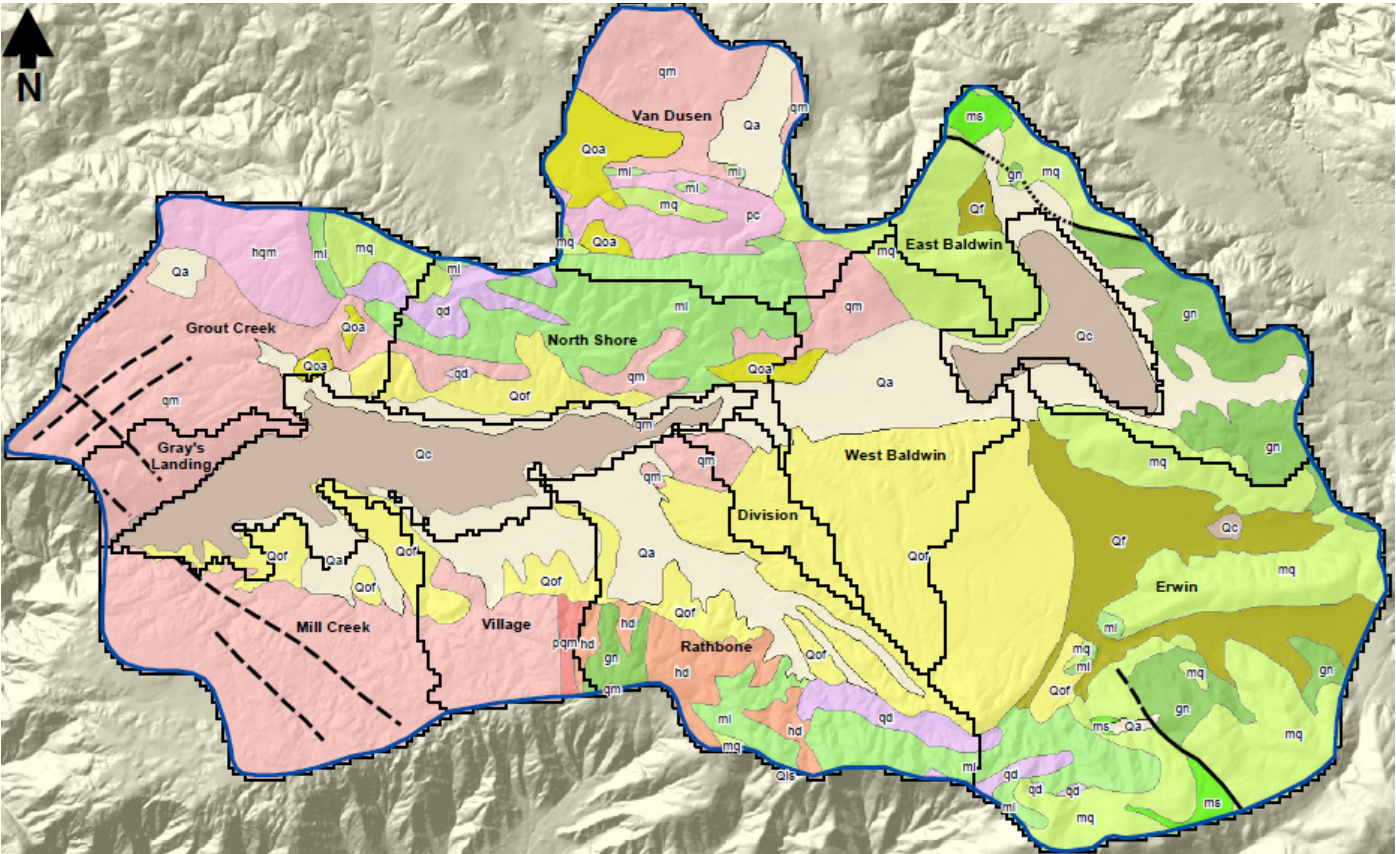
Of particular note, DBS&A evaluated natural recharge to groundwater within the Big Bear Valley groundwater basin. BBCCSD relies entirely on groundwater to provide water supplies to its customers. The objective of the recharge evaluation was to quantify the portion of precipitation that recharges the basin and provide the basis for quantifying the basin safe yield.



Water Master Plan continued page 2

DBS&A's recharge evaluation analyzed the surface and shallow subsurface using historical data sets spanning two decades. The approach consisted of a basin-wide soil-water balance analysis using site-specific data collected during the investigation including precipitation and other climatic parameters, soil hydrologic parameters, geology, land use, and vegetation. The project approach used a methodology similar to that used by the U.S. Geological Survey that DBS&A has successfully applied to numerous other watersheds in California and Nevada. DBS&A compared the site-specific results to various previous estimates of recharge and perennial safe yield. DBS&A subsequently used statistical methods to leverage the modeling results into useful water supply management and forecasting tools.

Associated with the master planning effort, DBS&A also prepared a drought contingency plan for the District for the purpose of preserving the District's limited potable water resources during times of declared water shortages. The document discusses (1) the District's four water supply shortage stages and their declaration processes, (2) the measures and restrictions for each of the District's four water supply shortage stages, and (3) the expected water savings due to each of the District's four water supply shortage stages. The document also discusses coordination with other regional water planning agencies, public notification procedures, enforcement, exceptions, and water connection limitations during a declared water shortage.



Bedrock Geology within the modeled Big Bear Valley Watershed domain

