
7.0 Model Results

The calibrated model produces a volumetric flow budget and predicted groundwater table elevations (*i.e.*, head values) during operation of the water system. **Figure 8** displays the predicted groundwater elevation contours on a potentiometric surface map of the study area.

7.1 Residual Analysis

Model validation is performed to determine how well the model results fit the observed data. The predicted head values are compared to the observed water levels to assess the model confidence using a residual analysis. A model is considered to fit the data if the residuals appear to behave randomly (USDC, 2006) and the magnitudes of the residual errors are acceptably small (BYU, 2009). The model calibration results were determined to fit the observation data. The predicted and observed head values used in the residual analysis are found in the data package of this report.

7.2 Volumetric Flow Budget

The hydrogeologic model is constructed on the assumption of a steady-state, closed system, where inflow equals outflow. A volumetric flow budget was developed for the project area that accounts for all of the simulated groundwater as it passes between model elements. Data tables accounting for the flow rate of groundwater that moves through the modeled area are contained in the model output files (**Data Package CD**). The hydrogeologic flow model accounts for several sources of groundwater inflow and outflow such as inflow from recharge derived from meteoric waters and surface water features and outflow to wells, springs and stream baseflow.

Groundwater inflow to the model from recharge is the water added to the groundwater system through groundwater recharge which is ultimately derived from precipitation. The inflow from streams is the water added to the groundwater system through losing stream reaches. Inflow from lakes and ponds is the water added to the groundwater system through leakage through the base of a lake, pond or other water impoundment.

Groundwater outflow to wells is the water extracted by registered water withdrawal wells. The outflow to lakes and ponds is the water that enters a lake, pond or other water impoundment through groundwater springs. Outflow to streams is the water lost from the groundwater system to maintain baseflow in gaining streams. Outflow to springs and ephemeral streams is the water lost to discharge to naturally flowing springs and ephemeral streams. From a modeling standpoint, springs and