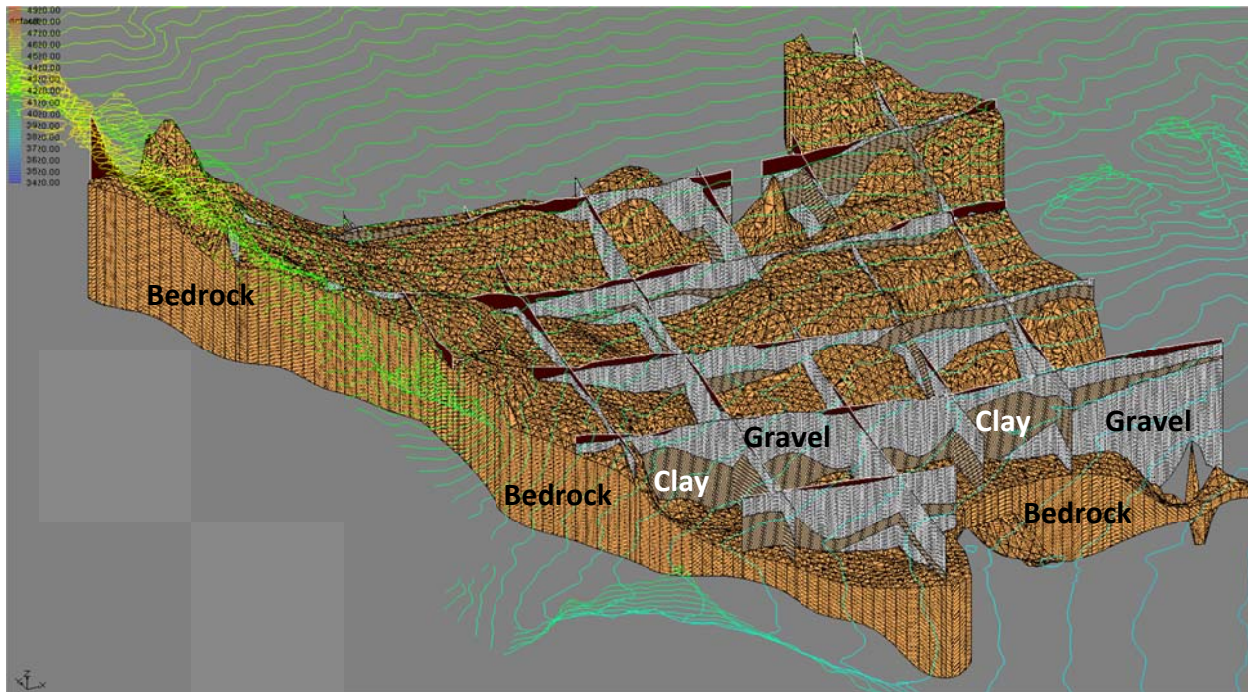


Montana Bureau of Mines and Geology (MBMG) – Groundwater Investigation Program (GWIP)

Helena Area GWIP Project: North Hills – Update September, 2010



Geology in a part of the North Hills study area as interpreted from driller's well log data in the Groundwater Information Center (GWIC) database

Completed contracts:

- Phil Farnes – precipitation maps and consulting
- Patrick Faber – summaries of aquifer testing in the North Hills area
- MSE – installation of shallow piezometers along Silver Creek
- H and L Drilling – Drilling, well installations, and aquifer test support (Valley Excavating and Helena Valley Fault sites)
- Diamond M Drilling: Exploratory drilling and well installations along the Helena Valley Fault (Diamond Hill property)
- Lindsay Drilling – Exploration and monitoring well installation at four locations in the North Hills area

Contracts underway:

- University of Idaho – METRIC evapo-transpiration calculations
- Lewis and Clark County Water Quality Protection District (LCWQPD) – ¼ FTE Hydrogeologist and technician for monthly groundwater level monitoring
- Lindsay Drilling – Deep exploratory and test wells at two sites near the crest of the North Hills on state-owned land
- Isotech Laboratories – stable oxygen, hydrogen, sulfur, and nitrogen isotope analyses of water samples from area wells, streams, canals, and drain ditches

North Hills Project Activities:

Began or re-instated monthly groundwater level monitoring at 26 wells, increased Lewis and Clark County Water Quality Protection District (LCWQPD) monitoring from quarterly to monthly at 4 wells, and collected monthly data for another 21 wells monitored monthly by LCWQPD. Instrumented seven wells with continuous recorders

Conducted a 6-day aquifer test with existing, unused wells at the Panoramic Subdivision site north of Lake Helena

Assisted with two privately conducted aquifer tests at a subdivision

Installed a pumping well and five observation wells near the Valley Excavating rock quarry and conducted a 5-day aquifer test at the site

Installed three wells near the Helena Valley Fault to examine hydrogeologic conditions in the vicinity of the fault and conducted numerous aquifer tests

Drilling of additional exploration and test wells began in early July and is expected to be completed in September

Montana Tech Geophysics Department conducted several resistivity surveys and a seismic survey on state and private land near Interstate 15. The department also completed gravity and magnetic surveys along Applegate Drive, Montana Avenue, and Prairie Road

Established three stream-monitoring sites along Silver Creek, including data recorder, staff gage, and shallow monitoring well installations

Began monitoring of stream flow at drains at numerous sites in March, which augments surface water flows measured by LCWQPD in Prickly Pear Creek, Ten Mile Creek, and Drain D2

Conducted two of three planned major water quality sampling events in April and August, in cooperation with LCWQPD. GWIC project samples are being analyzed by the MBMG laboratory, while LCWQPD project samples went to Energy Labs. Isotopes of certain elements are being analyzed by Isotech Laboratories, Inc.

Installed crest gages with buried temperature recorder buttons at four sites in the North Hills area to measure the depth and duration of intermittent flows in selected drainages

Installed two rain gages to collect precipitation data

Collected snow and water samples in March for stable oxygen and hydrogen isotope analyses at various elevations

Compiled aquifer test data from DNRC water rights records, the GWIC database, and a summary from Helena-area consultant Pat Faber

Processed well log data from hundreds of deep wells for 3D graphical display in Groundwater Modeling System. The display will be used to in develop the aquifer geometry of the groundwater model.