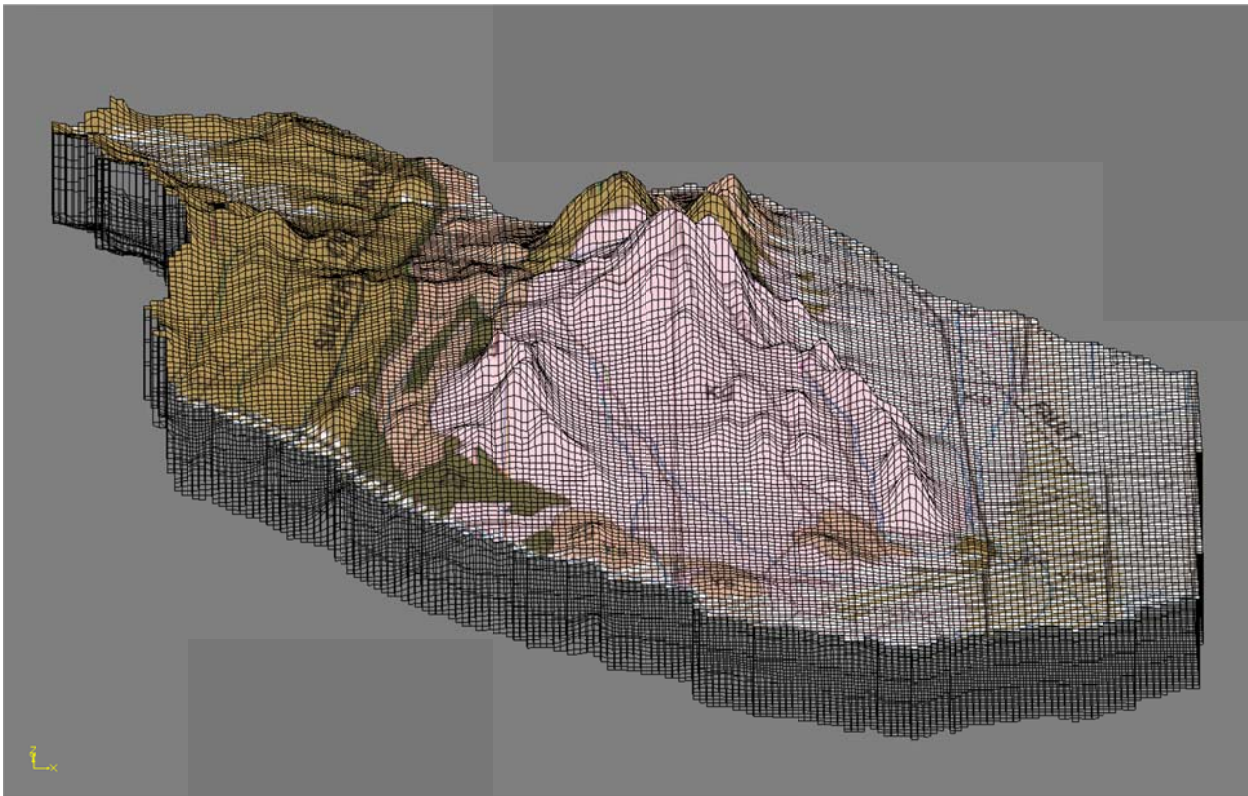


Montana Bureau of Mines and Geology (MBMG) – Groundwater Investigation Program (GWIP)
Helena Area GWIP Project: Scratchgravel Hills – Update September, 2010



Geologic map draped over an initial groundwater model grid for the Scratchgravel Hills area

Completed contracts:

- Phil Farnes – precipitation maps and consulting
- Patrick Faber – summaries of aquifer testing in the Scratchgravel Hills area
- MSE – installation of shallow piezometers along Silver Creek and Sevenmile Creek
- H and L Drilling – Aquifer test site drilling and well installation (Head Lane site on private land)
- Lindsay Drilling – Exploration, monitoring, and aquifer test site well installations at two sites in the Scratchgravel Hills on US Bureau of Land Management property

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
- Isotech Laboratories – stable oxygen, hydrogen, sulfur, and nitrogen isotope analyses of water samples from area wells, streams, canals, and drain ditches

Scratchgravel Hills Project Activities:

Began or re-instated monthly groundwater level monitoring at 38 wells in cooperation with Lewis and Clark County Water Quality Protection District (LCWQPD). Instrumented eight wells with continuous recorders

Constructed four stream-flow and shallow groundwater monitoring sites, equipped with data-logging instruments. Measure stream flow and water levels routinely.

Installed two wells to augment two existing unused wells for an aquifer test near the intersection of Head Lane and Franklin Mine Road. Conducted a 5-day aquifer test

Evaluated complex geology in the vicinity of mapped faults to ascertain conditions before drilling exploration and test wells

Installed six exploration and test wells at three sites on US Bureau of Land Management (BLM) land in the Scratchgravel Hills

Conducted two constant rate aquifer tests, one near the intersection of Head Lane and Franklin Mine Road, and one on BLM land north of the Head Lane area.

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 numerous sites in the Scratchgravel Hills area to measure intermittent flows in drainages

Installed a rain gage to collect precipitation data

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

Projected area maps, aerial photos, and digital elevation models into the groundwater model coordinate system (Montana State Plane system, North American Datum 1983, in feet)

Developing the groundwater conceptual model for the numerical model's grid and boundary conditions