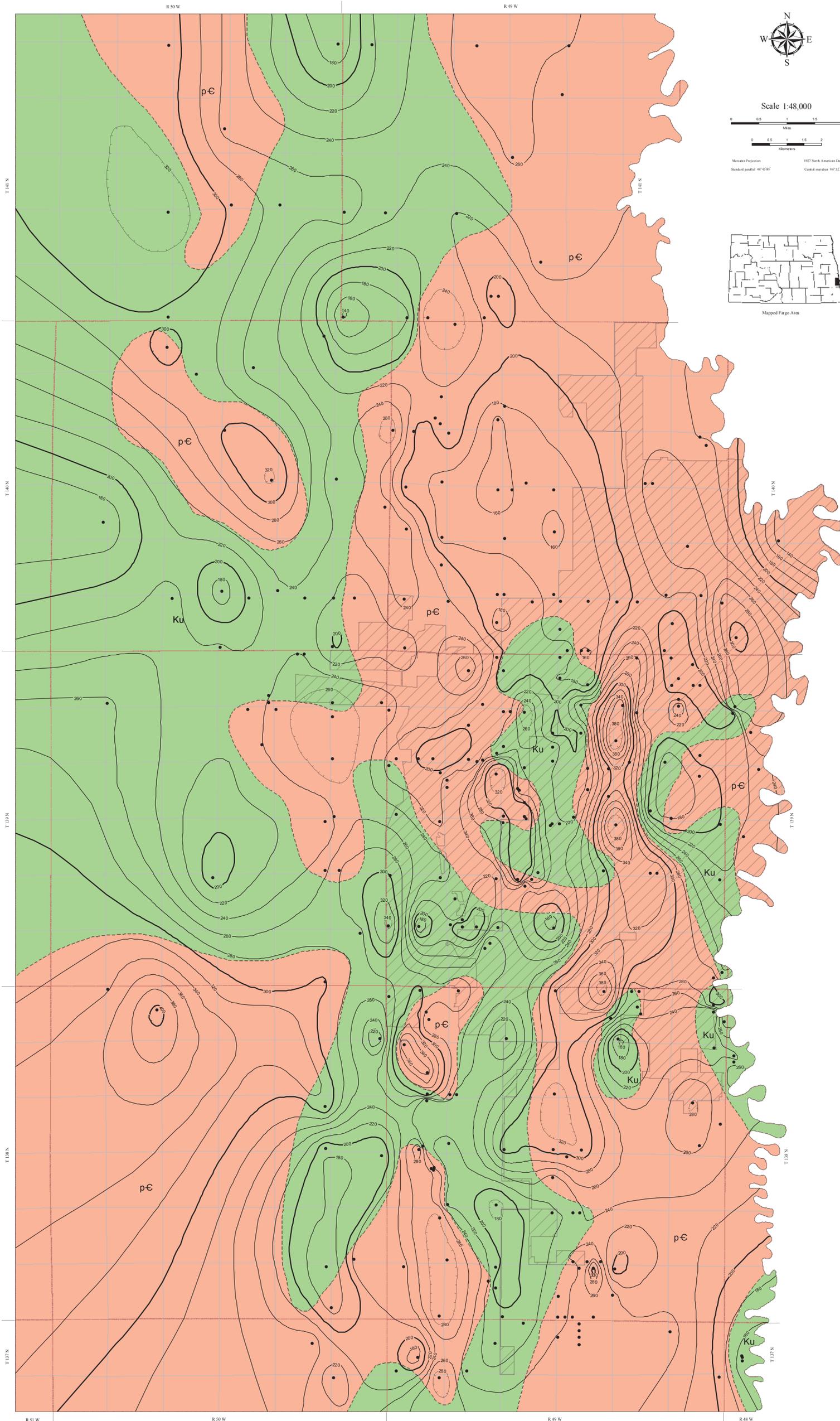


# Depth to Bedrock in the Fargo Area, North Dakota

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Bedrock in the Fargo area is defined as the consolidated rocks and sediments that are found at relatively shallow depths (<440 ft) lying directly beneath unconsolidated glacially derived sediments. The maps and associated contour lines presented here are drawn to the top of this surface and are represented as depth to bedrock (i.e. depth from the land surface to the first report of bedrock encountered in a drillhole). The map area depicted includes the Townships of Harwood, Berlin, Raymond, Reed, Barnes, Mapleton, Warren, and Stanley and covers 324 square miles (207,334 acres).

Depth to bedrock values (in feet below land surface) were compiled and interpreted from drillhole depths contained in drilling records maintained by the N.D. Geological Survey, N.D. State Water Commission, and N.D. Dept. of Transportation.

A total of 303 drillholes were used in the compilation of this dataset and consists of 147 test holes, 86 observation wells, and 70 water-supply (dominantly domestic) wells (Figure 1). There are hundreds of drillholes that have been drilled in the Fargo area for various reasons (dominantly water supply). The majority of drillholes used in this investigation consist of test holes that were a part of county geologic mapping studies completed in 1968 by the N.D. Geological Survey, U.S. Geological Survey (Klausing, 1968), and the N.D. State Water Commission. Only drillholes with reported bedrock depths were included as a part of this investigation.

The types of bedrock found beneath the Fargo area are of sedimentary (shale) and igneous (granitic) origin. Precambrian age (~2.5 Ga) granitic bedrock is found dominantly within the southwestern and northeastern map area beneath north Fargo and out towards Harwood to the north and Horace in the southwest. Cretaceous age (~99.6 Ma) marine shales of the Skull Creek and Belle Fourche Formations (undifferentiated) can be found beneath eastern West Fargo and western Fargo. These somewhat lithologically similar shale units are difficult to distinguish between in the subsurface.

Bedrock can be found within a depth range of 304 ft, and may be as shallow as 132 ft and as deep as 436 ft. The shallowest reported bedrock depth is found at 132 ft below the land surface in Cretaceous shale bedrock along the eastern margin of the map near the Red River. The deepest reported bedrock depth is found at 436 ft below the land surface in Precambrian granitic basement rock in the east-central portion of the map area just west of West Fargo and is found within a gently sloping southwest to north-east trending trough. Bedrock depths shallower than 200 ft may be found in the north-central portion of the map area. Bedrock depths deeper than 300 ft may be found in the northwestern and southwestern portions of the map and along a somewhat linear trough in the east-central map area, beneath the city of Fargo.

This map should see continued refinement as new drilling information is reported and recorded, and will be most useful during initial project planning, scoping and design, and for general informational purposes. The information presented here is not intended to supersede the requirement for site-specific, subsurface geologic information.

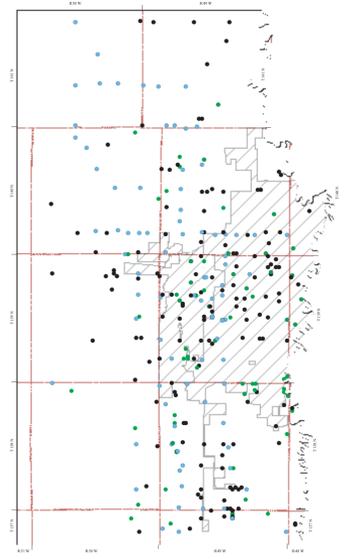


Figure 1. Test Holes (Black), Observation Wells (Blue), and Water Supply Wells (Green). Diagonal represents the limits of the cities of Fargo and West Fargo.

## GEOLOGIC SYMBOLS

**Ku** SKULL CREEK-BELLE FOURCHE FORMATIONS (Undifferentiated)  
SHALE: Black and brown to light gray, silty to sandy, micaceous, soft, massive, commonly bentonitic, with occasional pyrite, carbonaceous, some white to gray, fine-grained, noncalcareous sandstone and silts. Mesozoic (Cretaceous) marine sediments.

**p-ε** BASEMENT ROCK OF THE SUPERIOR PROVINCE (Weathered)  
GRANITE: Dark to light green and gray to white, commonly weathered, soft, greenish-pink-white kaolinitic clay, occasional angular quartz grains. Precambrian (Archean) basement rocks.

--- Approximate Subsurface Contact Between Geologic Units

— Index Depth to Bedrock Contour

— Supplementary Depth to Bedrock Contour

Contour Interval = 20 ft (between all contours)

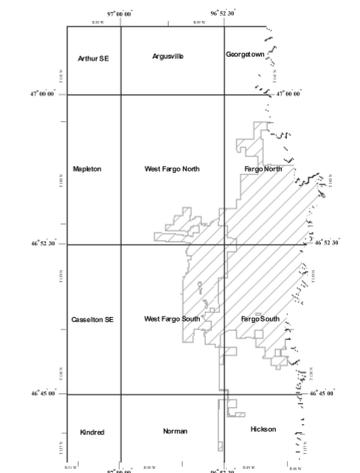
• Drillhole Locations

## MISC SYMBOLS

--- Township Boundary

— Section Boundary

▨ City Boundaries of Fargo and West Fargo



USGS 1:24,000 Topographic Quadrangles within the Mapped Fargo Area. Diagonal represents the limits of the cities of Fargo and West Fargo.