

EXPLANATION

SEDIMENTARY ROCKS

Recent alluvium
 Gravel, sand, silt, and clay. Most gravel clasts are limestone. Generally less than 20-30 ft thick along streams. Occurs in meanders of the Blanco River, Sink Creek, and Purgatory Creek, and as a broad area at the Balcones Escarpment under the city of San Marcos.

Lower terrace alluvium
 Gravel, sand, silt, and clay. Most gravel clasts are limestone. Generally 30 ft thick. Occurs primarily as a broad terrace near the Blanco and San Marcos rivers. Often has a resistant caliche cap where exposed in riverbanks.

Upper terrace gravel
 Gravel, sand, silt, and clay. Occurs in small patches at higher elevations at and around the Balcones Escarpment in the map area, with one occurrence several miles southeast of the scarp. May be the "Uvalde gravel" recognized elsewhere along the escarpment.

Bergstrom Formation
 Montmorillonitic mudstone. Relatively less calcium carbonate than underlying Pecan Gap Formation. Locally contains large specimens of *Exogyra ponderosa*. Supports growth of mesquite and juniper assemblage. Occurs in the southeast corner of the map area.

Pecan Gap Formation
 Montmorillonitic mudstone. Relatively more calcium carbonate than overlying Bergstrom Formation. Locally contains large specimens of *Exogyra ponderosa*. Forms unstable slopes in natural steep-slope conditions (e.g. near the San Marcos River) and where excavated for development. Supports growth of mesquite and juniper trees. Occurs over a large area southeast of the Balcones Escarpment in the southern half of the map.

Austin Group
 Light gray marly or chalky limestone and tan marly fissile shale, 160-200 ft thick (DeCook, 1963). Formations of the Austin Group recognized elsewhere are not mappable in this area. Contains small seams and crystals of pyrite or marcasite in some areas. Upper contact not exposed. Occurs in a broad area in the northeast quarter of the map area.

Eagle Ford Formation
 Blue calcareous shale and gray, arenaceous, bentonitic limestone (DeCook, 1963). Consists of three layers having a total thickness of 20-25 ft: lower bentonitic (montmorillonitic) shale (6-7 ft), middle calcareous flag sandstone or siltstone (4-5 ft), and upper shale (12-13 ft). Lower and upper contacts are distinctive on air photos. Subject to slumping where excavated for development. Occurs with Del Rio Clay, Georgetown and Buda Formations in a band extending from the northeast to the southwest corner of the map area.

Buda Formation
 Tan and gray, massive, hard, nodular limestone (DeCook, 1963). Hard, nodular limestone in lower part and hard, thick-bedded limestone in upper part. Total thickness about 45 ft. Lower and upper contacts readily distinguished on air photos. Supports oak-juniper assemblage. Occurs with Del Rio Clay, Georgetown and Eagle Ford Formations in a band extending from the northeast to the southwest corner of the map area.

Del Rio Clay
 Blue-gray to tan gypsiferous, ferruginous, marly shale, 40-60 ft thick (DeCook, 1963); about 45 ft thick in map area. Clays are dominantly illite and kaolinite in unweathered state, but the illite is converted in the weathered zone into plastic montmorillonite. Characterized by gypsum veinlets, pyrite or marcasite, and abundant specimens of *Limnospira crotchfordi*. Subject to slope failures during construction in the weather zone. Distinguished in the field by predominance of mesquite trees in a clayey soil. Lower and upper contacts readily distinguishable on air photos. Occurs with Georgetown, Buda and Eagle Ford Formations in a band extending from the northeast to the southwest corner of the map area.

Georgetown Formation
 Light gray and white argillaceous nodular limestone and tan calcareous shale, 25 to 35 feet thick (DeCook, 1956, 1963). Sharp contact with underlying Person Formation. Supports oak-juniper assemblage. Occurs with Del Rio Clay, Buda, and Eagle Ford Formations in a band extending from the northeast to the southwest corner of the map area.

Edwards Group, undivided
 In Hays County, upper gray dolomitic, siliceous, massive, honeycombed limestone overlies lower light gray argillaceous, nodular limestone (DeCook, 1963). Thickness is 430-450 ft in the San Marcos area (Rose, 1972). Divided by Rose (1972) into a lower Kainer and an upper Person Formation, separated by the "Regional Dense Member". Comprises the principal aquifer in the map area and throughout central and southwest Texas. Underlies typical hill country landscape, occurring in a broad band in the west and northeast part of the map area. Supports dense growth of oak and juniper. Dolines and karst solution features are common.

Person Formation
 Gray, dolomitic, siliceous, massive, honeycomb-weathering limestone containing a regionally persistent lowermost bed, the Regional Dense Member of Rose (1972). Thickness in the San Marcos area is 130 to 150 ft (Rose, 1972). Conformably distinguishable as a mapping unit only when this lower bed is present; elsewhere mapped as "Ker" or undivided Edwards Formation (Ked).

Kainer Formation
 Light gray argillaceous nodular limestone, similar in most other aspects to the Person Formation. Thickness 300 ft (Rose, 1972). Distinguishable as a mapping unit only where overlain by the Regional Dense Member of the Person Formation; elsewhere mapped as "Ker" or undivided Edwards Formation (Ked). Limestones of the underlying Walnut Formation, as described in Hays County by DeCook (1963) and Davis (1962), crop out only in the Blanco River canyon near the northwest corner of the map and are here included with Kainer Formation.

Glen Rose Formation
 Finely crystalline dolomite interbedded with dolomitic limestone and marl. Characterized by DeCook (1963) as "hard limestone with abundant argillaceous marl" with a thickness of 500-900 ft in Hays County. Crops out only in the Blanco River canyon near the northwest corner of the map area, where the upper 35 to 45 feet are exposed.

Geological Symbols

Contact
 Observed, inferred or concealed

Fault
 Observed, inferred or concealed; arrow on downthrown side where known or inferred

Doline

REFERENCES

Davis, W. E., 1962. Geology of Lime Kiln quadrangle, Hays County, Texas: Univ. Texas (Austin), M.A. thesis (unpublished), 90 p.

DeCook, K. L., 1956. Geology of San Marcos Springs quadrangle, Hays County, Texas: Univ. Texas (Austin), M.A. thesis (unpublished), 86 p.

DeCook, K. L., 1963. Geology and ground-water resources at Hays County, Texas: U.S. Geol. Survey Water-Supply Paper no. 1612, 72 p.

Grimshaw, T. W., 1976. Environmental Geology of Urban and Urbanizing Areas: A Case Study From the San Marcos Area, Univ. of Texas (Austin) Ph.D. Dissertation (unpublished), 244 p.

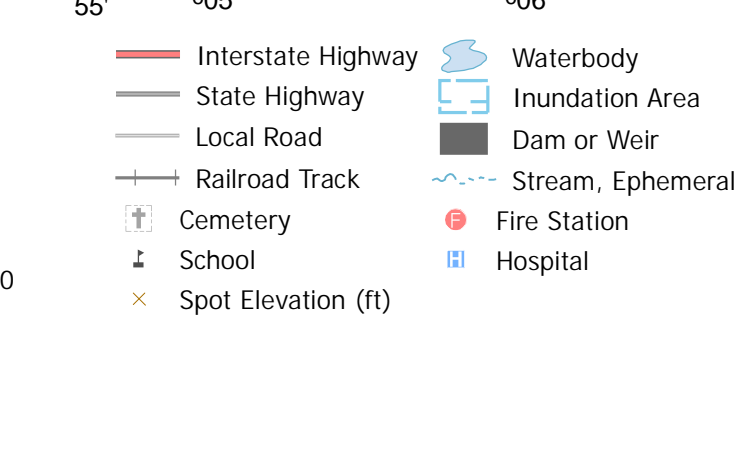
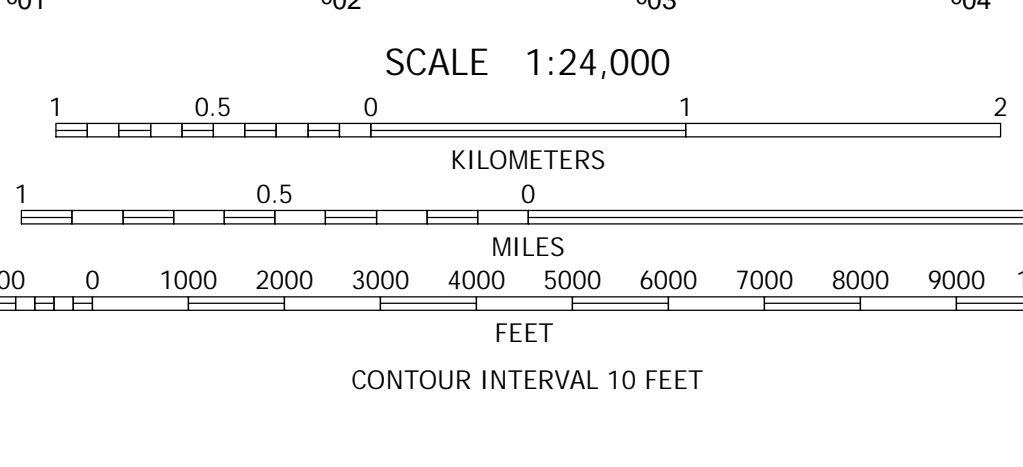
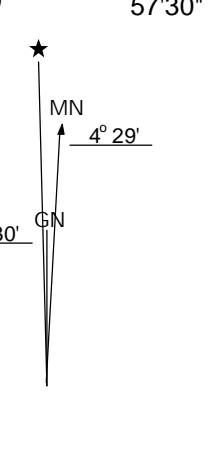
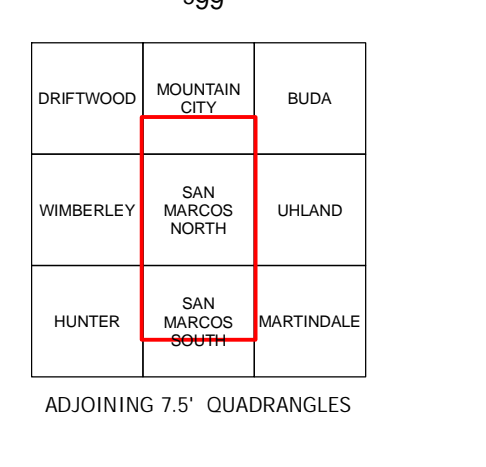
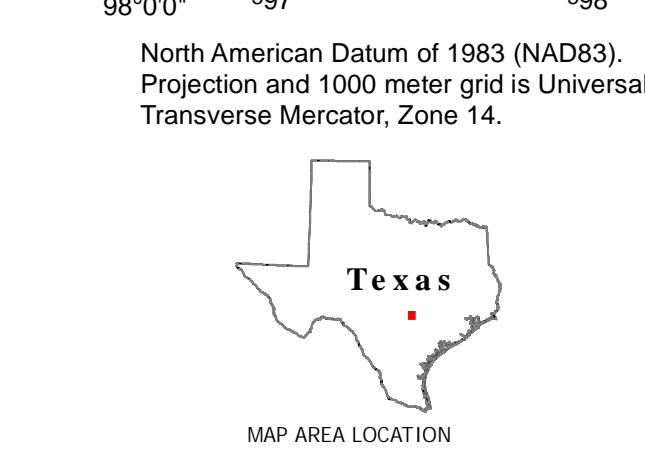
Rose, P. R., 1972. Edwards Group, surface and subsurface, central Texas: Univ. Texas (Austin) Bur. Econ. Geology, Rept. Inv. no. 74, 198 p.

DIGITAL DATA SOURCES

Roads, Boundaries and Structures.....National Map, 2013
 Place Names.....Geographic Names Information System, 2013
 Hydrography.....National Hydrography Dataset, 2010
 Elevation, Hillshade Data.....National Elevation Dataset, 2004
 Contour Lines and Spot Elevations.....TNRS, 2010

ACKNOWLEDGEMENTS

Map preparation was supported by a grant from the Barton Springs/Edwards Aquifer Conservation District. Jeffrey Horowitz converted paper geologic maps to digital format.



Geology by Thomas W. Grimshaw, 1973-1975; Cartography and GIS by Mark A. Helper