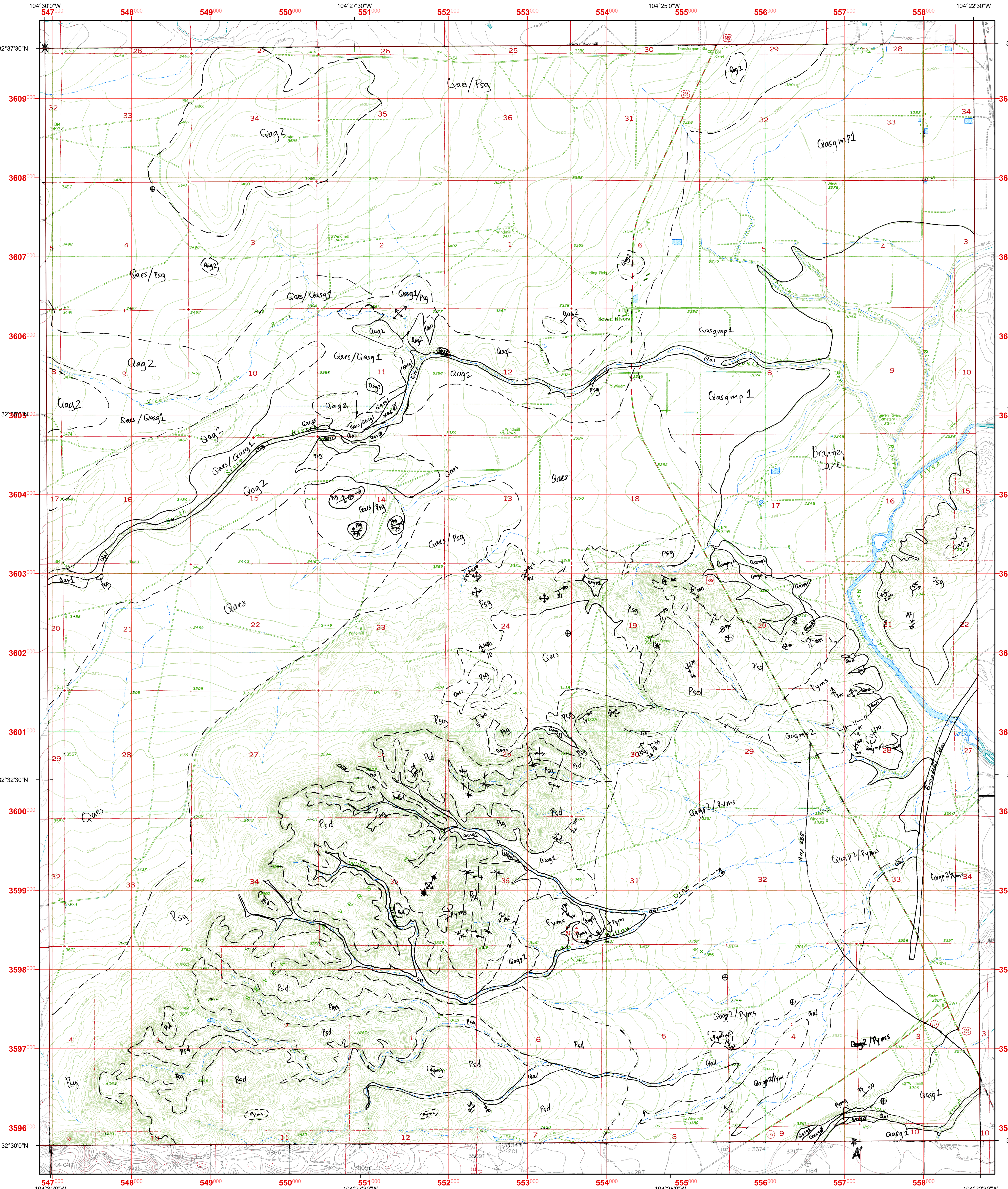
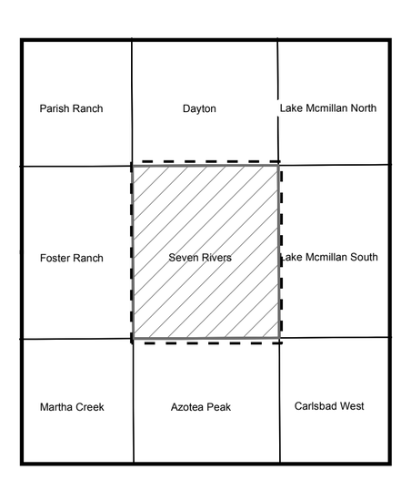
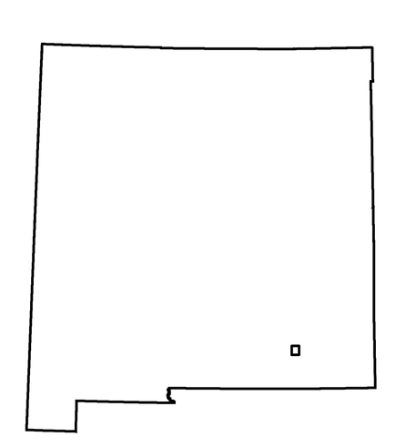


Base from U.S.Geological Survey 1954, from photographs taken 1947 and field checked in 1954.
1927 North American datum, UTM projection -- zone 13N
1000- meter Universal Transverse Mercator grid, zone 13, shown in red





Magnetic Declination
May, 2005
8º 42' East
At Map Center

Geologic Map of the Seven Rivers 7.5 - minute Quadrangle

by
Carol M. Dehler, Joel L. Pederson, and Stacy S. Wagner

May 2005

1:24,000

CONTOUR INTERVAL 20 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

COMMENTS TO MAP USERS

A geologic map displays information on the distribution, nature, orientation, and age relationships of rock and deposits and the occurrence of structural features. Geologic and fault contacts are irregular surfaces that form boundaries between different types or ages of units. Data depicted on this geologic quadrangle map may be based on any of the following: reconnaissance field geologic mapping, compilation of published and unpublished work, and photogeologic interpretation. Locations of contacts are not surveyed, but are plotted by interpretation of the position of a given contact onto a topographic base map; therefore, the accuracy of contact locations depends on the scale of mapping and the interpretation of the geologist(s). Any enlargement of this map could cause misunderstanding in the detail of mapping and may result in erroneous interpretations. Site-specific conditions should be verified by detailed surface mapping or subsurface exploration. Topographic and cultural changes associated with recent development may not be shown.

Cross sections are constructed based upon the interpretations of the author made from geologic mapping, and available geophysical, and subsurface (drillhole) data. Cross-sections should be used as an aid to understanding the general geologic framework of the map area, and not be the sole source of information for use in locating or designing wells, buildings, roads, or other man-made structures.

The map has not been reviewed according to New Mexico Bureau of Geology and Mineral Resources standards. The contents of the report and map should not be considered final and complete until reviewed and published by the New Mexico Bureau of Geology and Mineral Resources. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the State of New Mexico, or the U.S. Government.

This work was performed under the STATEMAP component of the USGS National Cooperative Geologic Mapping Program. Funding for geological mapping was provided by the U.S. Geological Survey and the New Mexico Bureau of Geology and Mineral Resources, a division of New Mexico Tech. The New Mexico Office of the State Engineer is providing funding for the compilation effort as well as the hydrologic investigation underway.

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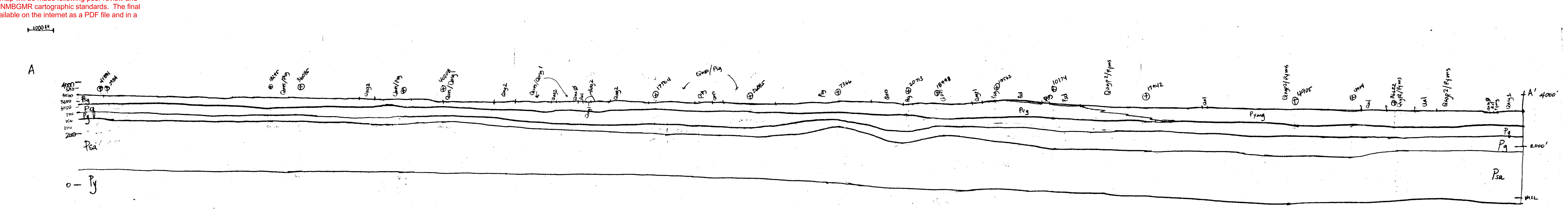
This and other maps are available in PDF format from:
http://geoinfo.nmt.edu/statemap

or contact:
NMBGMR Publications -- [505] 835-5410
NMBGMR Geologic Information Center -- [505] 835-5145

DRAFT

NMBGMR OF-GM 98

This draft geologic map was produced from scans of hand-drafted originals from the author(s). It is being distributed in this form because of the demand for current geologic mapping in this important area. The final release of this map will be made following peer review and redrafting in color using NMBGMR cartographic standards. The final product will be made available on the internet as a PDF file and in a GIS format.



Unit descriptions

Qal-alluvium (Holocene)--Brown (7.5 YR 6/4), silt to sand, well sorted, subangular to subrounded, dominantly quartz with rare lithics, occupies draws and river channels and associated active floodplains. Little to no vegetation. Overlies or inset into all older units. Thickness 0-2m.

Qaes-alluvial and eolian deposits (Pleistocene (?) to Holocene)-Brown (7.5 YR 6/4), silty clay to silt to sand, well sorted, subangular to subrounded grains composed of 70% quartz and 30% carbonate and chert. Unit locally weathers into badlands and exhibits piping. Common veneer on nearly all Quaternary deposits in the map area and commonly overlies Psg and Pymg. Thickness ≤10 m.

Qas0-alluvial sand side canyon (Holocene)-- Light brown (7.5 YR 6/4), silt to fine-lower sand, subrounded to subangular, well sorted, massive, quartzose and lithic grains. Forms terrace ~2m above modern alluvium.

Qasm1-alluvial sand mainstem (Pleistocene (?) to Holocene)- Light brown (7.5 YR 6/4), silt to fine-lower sand, subrounded to subangular, well sorted, massive, quartzose and lithic grains, scattered pebbles and rare cobbles dispersed within matrix, rare calcic nodules and laminated drapes of dark red mud. Surface nearly always reworked into coppice dunes. Top of unit forms a terraces(T1) five meters above modern Pecos River and deposit is equivalent to flume sand in Carlsbad. May overlie or be inset into Qagm2. Thickness ≤10 m.

Qagsr1 or Qagr alluvial sand Seven Rivers or Rocky Arroyo (Pleistocene (?) to Holocene)- Light brown (7.5 YR 6/4), silt to fine-lower sand, subrounded to subangular, well sorted, massive, quartzose and lithic grains. Top of unit forms a terrace (T1) five meters above modern drainage. May overlie or be inset into Qag2 units. Thickness ≤10 m.

Qasp1 alluvial sand piedmont (Pleistocene (?) to Holocene)- White to pink (5 Y 8/1-5 YR 7/4), quartz sand and silt with mainstem pebbles, poorly exposed. Inset into or capping Qa2 deposits and caps the fill-cut T2. Laterally equivalent to Qasm1. Thickness 0-2 m.

Qaspm1 alluvial sand piedmont (Pleistocene (?) to Holocene)- Transitional deposit of Qasm1 and Qasp1.

Qagm2-alluvial gravel mainstem (Pleiostocene) Pink (5 YR 7/4) to red to tan, medium sand to pebble and small cobbles (<12 cm dia.) in sand and gravel lenses, subangular to well rounded, poorly to well sorted. Pebbles of chert, gray and maroon quartzite, metamorphic clast(?),smaller cobbles are carbonates, chert, quartzite, dolomite, limestone, metamorphic, schist, bull quartz, and basalt, and large pebbles and small cobbles are carbonate lithics. Gravel becomes sandy conglomerate where well cemented by calcite. Capped by calcrete layer (0-< 2 m thick). Commonly overlies Permian units. Thickness 0-75 m.

Qagp2-alluvial sand and gravel piedmont (Pleistocene) Gray to yellow gravel, poorly sorted, angular to subrounded dolomite clasts. Sand composed of quartz and locally carbonate cemented, imbrication N40E. Piedmont deposit along east side of Seven Rivers Hills area. Thickness 0->~75 m.

Qagsr2 or Qagr alluvial gravel Seven Rivers or Rocky Arroyo (Pleistocene) Gray to yellow gravel, poorly sorted, angular to subrounded dolomite clasts. Sand composed of quartz and locally carbonate cemented. Thickness 0->~75 m.

Pymg---Yates Formation—mixed gypsiferous facies
Gypsum with minor dolomite, siltstone, and sandstone. Dolomite is pink to salmon to very light gray, massive to vesicular, and exhibits extensive chickenwire textures, rippenstein weathering, crinkly laminations, thinly bedded, teepee structures, green gypsiferous siltsone interbedded. . Gypsum locally fills void spaces in the dolomite, and was likely remobilized from this unit. Sandstone is yellow, locally silica cemented. Folded into domes and basins. This facies is only present in Rocky Arroyo in the SE part of the quadrangle. Contact with overlying gravels is sharp or covered. Thickness XX m.

Psd---(Yates Formation—mixed facies or) Azotea Tongue dolomite (of Kelley 1971)
Dolomite with interbedded siltstone, sandstone, and gypsum. Dolomite is thinly to thickly bedded, massive, yellow to light gray to pink to orange, vesicular, silty, clayey, very finely crystalline to sugary, undulose bedding, paper lams, crinkly lams, interbedded with thin to medium beds of pink dolomitic siltstone or green shale or yellow sandstone. Thickness XX m.

Psg---Seven Rivers Formation---thin- to medium-bedded, dolomite, commonly vesicular, tan-grey weathered, light grey fresh, massive to laminated, interbedded with m-scale intervals of red siltstone and very fine sandstone and gypsum, in cycles (m-scale), rippenstein and elephant skin weathering, interbedded with m-scale intervals of red siltstone and gypsum, in cycles (m-scale), very fine sand to silt, with ripple-cross lamination and local soft-sediment deformation (some due to gypsum mobilization) interbedded with white to yellow to green to gray to red, punky to crystalline massive gypsum (up to 2 m thick), crystals cm scale, some gypsum intervals lack siltstone and are interbedded with very thin dolomite beds, laminated to stromatolitic, gypsum nodules in siltstone intervals, many small folds (scale) and caverns characterize this unit, folds are commonly trough shaped, small-scale def is common in this unit, yet, large scale stratographic deformation is minimal—beds can be traced laterally for kms in the Seven Rivers Hills area, several scales of folding—m-scale, 10-m scale, and km scale, all low amplitude, 5-10 m scale cycles of interbedded gyp and siltstone and dol are characteristic of this unit. May be divisible into two units—a red siltstone rich, and siltstone poor unit. Upper contact with Psd may be an unconformity and is defined by a breccia zone several meters thick. Contact between Psg and Psd is common area for cave formation. Thickness XX m.

Pq—Queen Formation (Guadalupian)-- In cross section only.

Pg—Gray Formation (Guadalupian)— In cross section only.

Psa—San Andres Formation—(Leonardian to Guadalupian)—In cross section only.

Map symbols:

Bedding contact-dashed where approximately located or where interpreted from air photo

Basin- arrows on axis denote plunge direction

Dome—arrows on axes denote plunge directions

c—cave in gypsum or carbonate unit

Small-scale fold—numbers denote trend and plunge, arrows on axis indicate anticline vs, syncline

Oil/gas well location
(suggested type logs for subsurface stratigraphic picks are logfile numbers XXXXX)

Water well location

Severn Rivers Quadrangle

CORRELATION OF MAP UNITS