

May 5, 2018

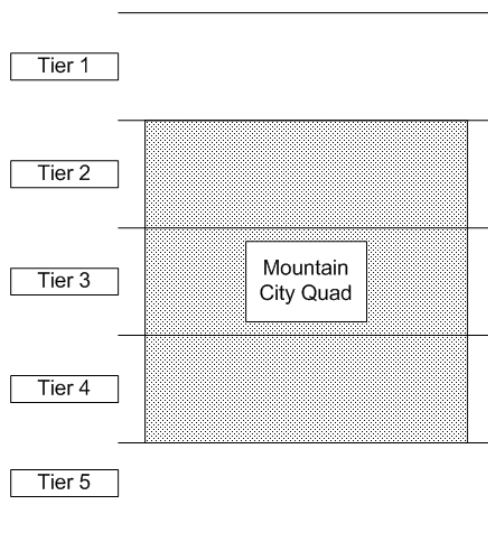
# MEMORANDUM

To: Brian Hunt  
From: Tom Grimshaw  
Subject: Digitization of the Geologic Map for the Mountain City Quadrangle

In my memo of January 22, 2018 (Attachment A), I proposed the following process for digitizing our revised geologic map of the Mountain City Quadrangle:

1. Digitize the manually prepared geologic map described above. You indicated that this task might be accomplished with resources at BSEACD.
2. Check the digitization to make sure it is fully usable for preparation of a GIS-based geologic map on the topographic base.
3. Prepare a draft GIS geologic map.
4. Using the air photos with the “original” geology, make adjustments as required to the GIS map to make sure the features are shown correctly.
5. Prepare a short description of the stratigraphy and structural geology, and other features (such as hydrologic characteristics) to accompany the geologic map.

The geologic map of the quadrangle is documented in nine 2.5-minute segments and, in addition, portions of the 16 adjoining segments (to allow “mapping into” the surrounding quads). The 25 segments are in five “Tiers” from north to south as depicted below.



Each Tier consists of five segments. Appendices B to F provide images of the geologic mapping for the Tiers 1 to 5. It is anticipated that these maps may be digitized for the geologic map of the Mountain City Quadrangle

Please let me know if you have any questions or comments.

## Attachment A.

### Text of January 22, 2018 Memo

This memo summarizes the procedure we discussed last week for getting the geologic map of the Mountain City quadrangle digitized and put into GIS format. The process for preparing the map up to this point has consisted of the following steps.

1. The USGS Mountain City Quadrangle (1968) is being used as the topographic base map for the geologic mapping.
2. The mapping is accomplished on air photo stereo pairs that were taken in 1958<sup>1</sup>. These photos are of high quality and were taken just a couple of years after the major Texas drought that ended in 1956. The 1958 photos are available on the USGS “Earth Explorer” website.
3. In general, the surface geologic features – stratigraphic units and faults of the Balcones Fault Zone – were mapped on the photos in conjunction with field checks for outcrops and exposures of faults.
4. Using transparency copies of the topographic map (in nine 2½-minute segments of the quadrangle), the geology was manually copied to the base map.
5. The stratigraphic units were colored with colored pencils using contrasting hues to make the complex faulting of the Balcones Fault Zone more visible.
6. As progress was made in the fieldwork and mapping, the results were recorded in periodic memos that I prepared and addressed to you. These memos and other work products have been placed on Dropbox where we can both access them in the folder “BSEACD TWG Share”.

The fieldwork for this mapping project has been accomplished jointly by you, me, and other members of the BCEACD staff. The mapping has now been essentially completed, so the process for digitizing the maps that we discussed is as follows:

6. Digitize the manually prepared geologic map described above. You indicated that this task might be accomplished with resources at BSEACD.
7. Check the digitization to make sure it is fully usable for preparation of a GIS-based geologic map on the topographic base.
8. Prepare a draft GIS geologic map.
9. Using the air photos with the “original” geology, make adjustments as required to the GIS map to make sure the features are shown correctly.
10. Prepare a short description of the stratigraphy and structural geology, and other features (such as hydrologic characteristics) to accompany the geologic map.

We will consider the possibility of a continuing role for Mark Helper in finalizing the map and report and will also look for a suitable venue for their publication, such as the UT Bureau of Economic Geology.

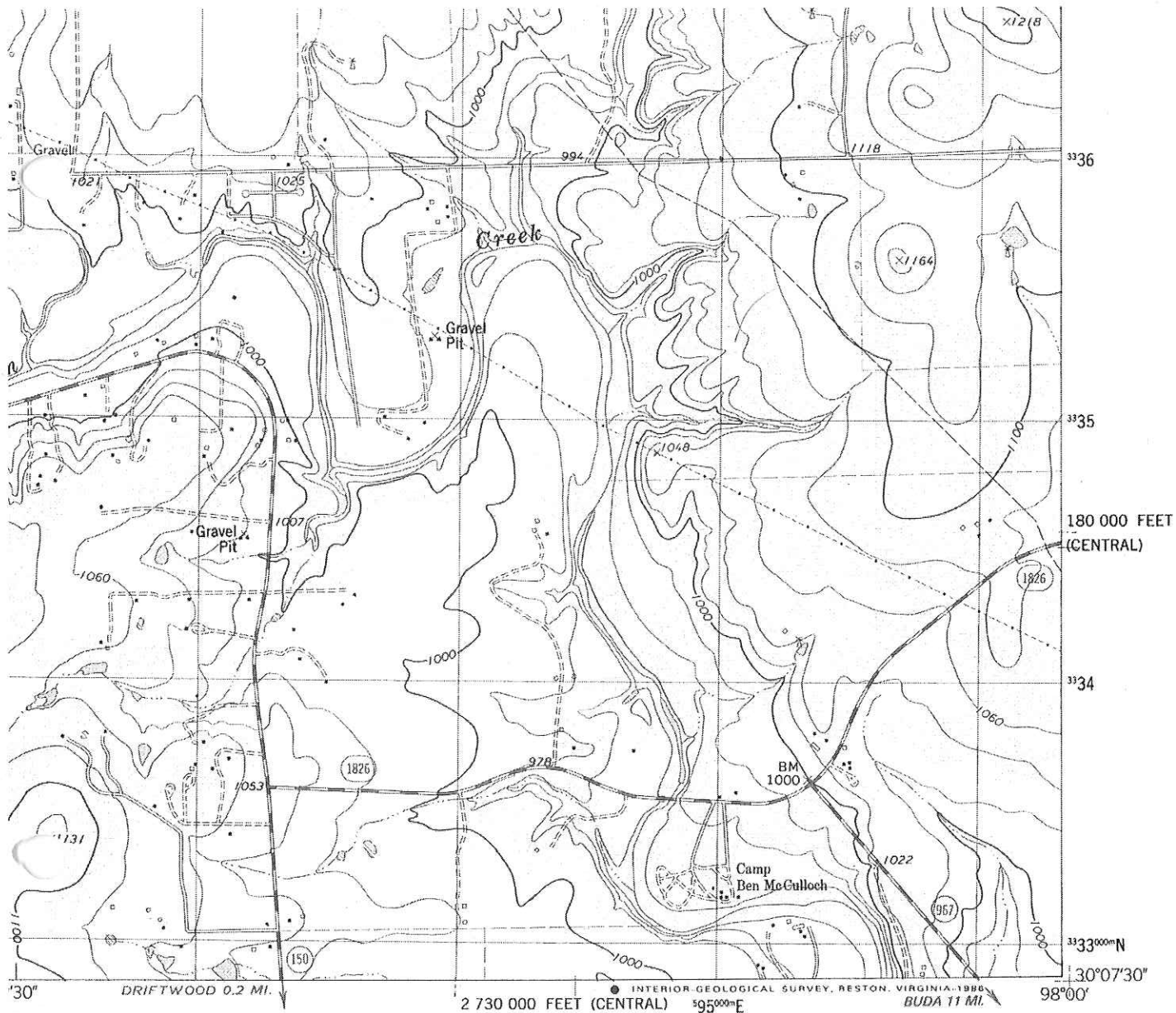
I look forward to your feedback on this description of the procedure that we discussed last week.

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<sup>1</sup> Geologic mapping of the quadrangle was previously done by Richard Smith for a 1978 MA thesis at The University of Texas, which incorporated pre-existing mapping of the southern one-third of the quad that I had done for my 1976 dissertation, also at UT. The current project builds on this previous work to take advantage of new insights on the faulting in the area as well as our increased mapping experience in central Texas geology.

Attachment B.

Geologic Map Segments for Tier 1



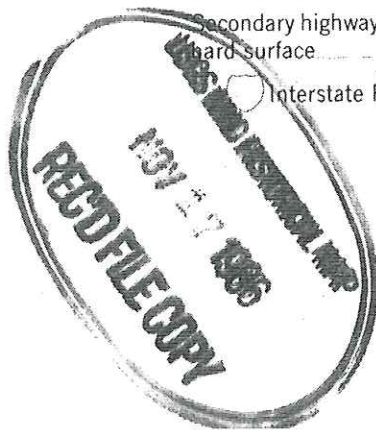
#### ROAD CLASSIFICATION

Primary highway, hard surface ——— Light-duty road, hard or improved surface ———  
 Secondary highway, hard surface ——— Unimproved road ———  
 Interstate Route U. S. Route State Route



QUADRANGLE LOCATION

3098-114



DRIPPING SPRINGS, TEX.

30098-B1-TF-024

1986

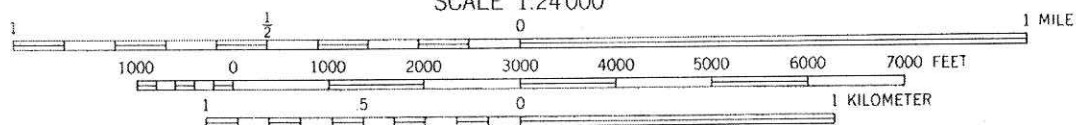
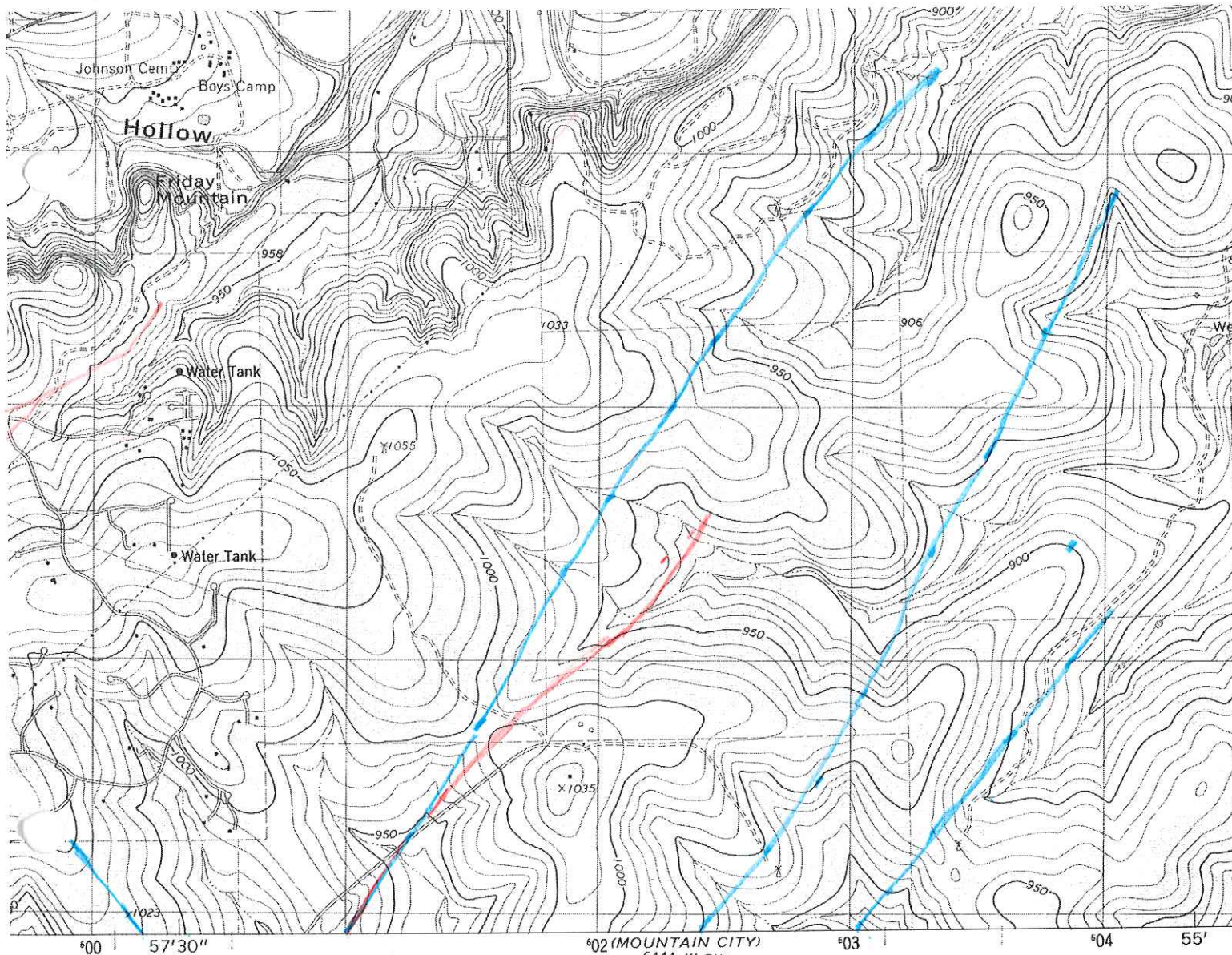
DMA 6344 II NE-SERIES V882

(MOUNTAIN CITY)  
644 II SW

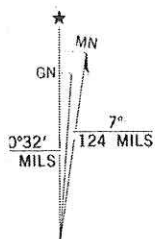






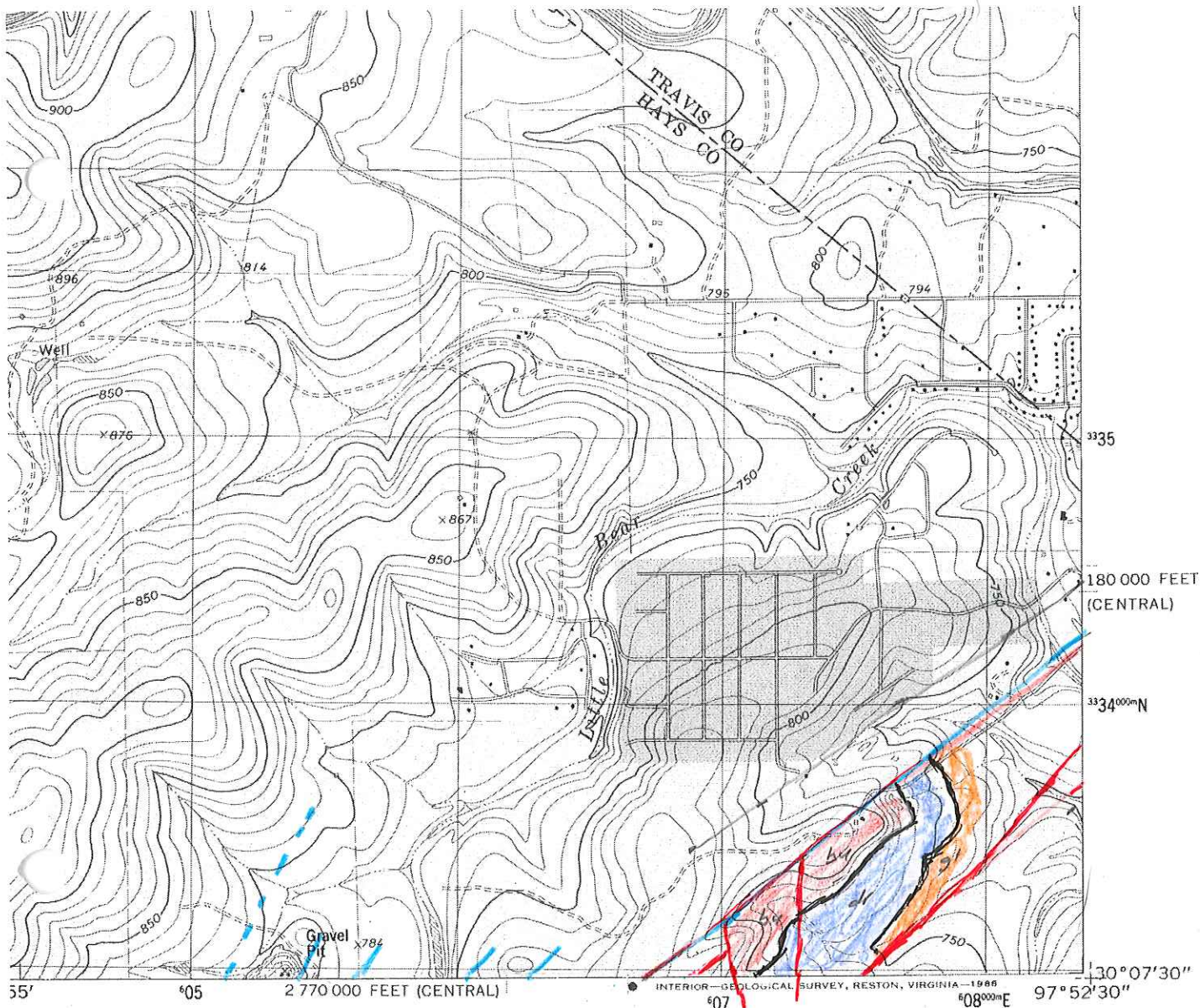


CONTOUR INTERVAL 10 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929



THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS  
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST





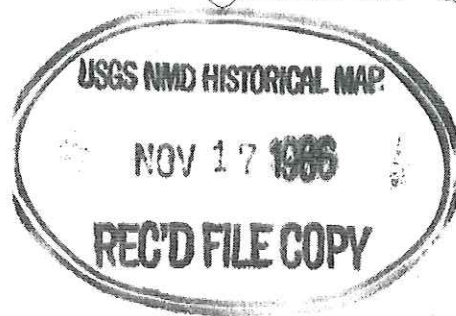
#### ROAD CLASSIFICATION

- |                                    |  |
|------------------------------------|--|
| Primary highway,<br>hard surface   | Light-duty road, hard or<br>improved surface |
| Secondary highway,<br>hard surface | Unimproved road                              |
| ○ Interstate Route                 | ○ U. S. Route    ○ State Route               |



QUADRANGLE LOCATION

3097-223



#### SIGNAL HILL, TEX.

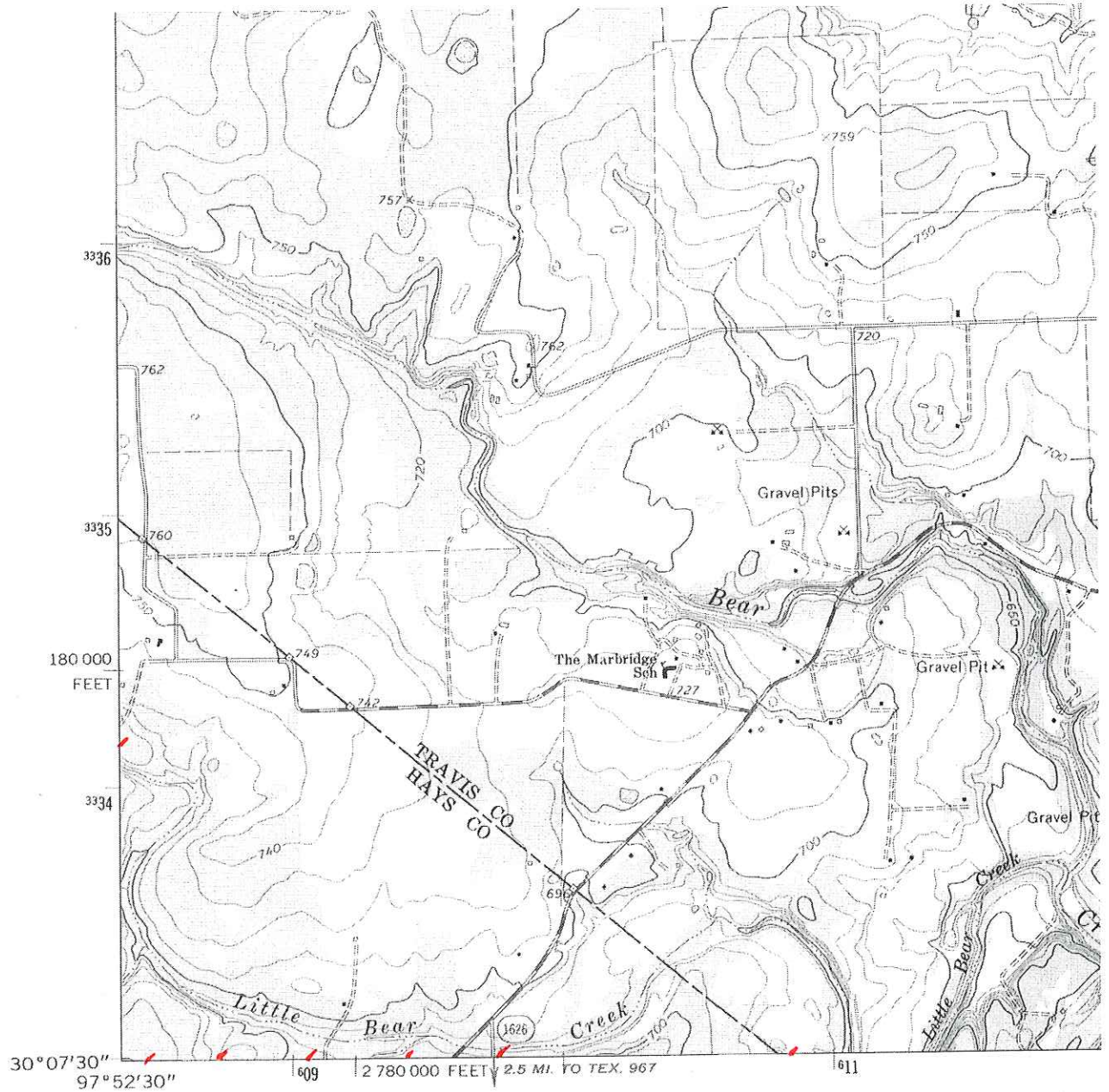
NW/4 BUDA 15' QUADRANGLE  
30097-B8-TF-024

1986

DMA 6444 III NW-SERIES V882

(BUDA)  
6444 III SE





(MOUNTAIN CITY)  
6444 III SW

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

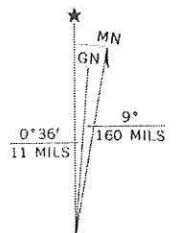
Topography by photogrammetric methods from aerial photographs taken 1954. Field checked 1955. Revised from aerial photographs taken 1966. Field checked 1966

Polyconic projection. 1927 North American datum  
10,000-foot grid based on Texas coordinate system,  
central zone

1000-meter Universal Transverse Mercator grid ticks,  
zone 14, shown in blue

Red tint indicates areas in which only landmark buildings are shown

Fine red dashed lines indicate selected fence lines



UTM GRID AND 1966 MAGNETIC NOR  
DECLINATION AT CENTER OF SHEET

Oak Hill (SW)

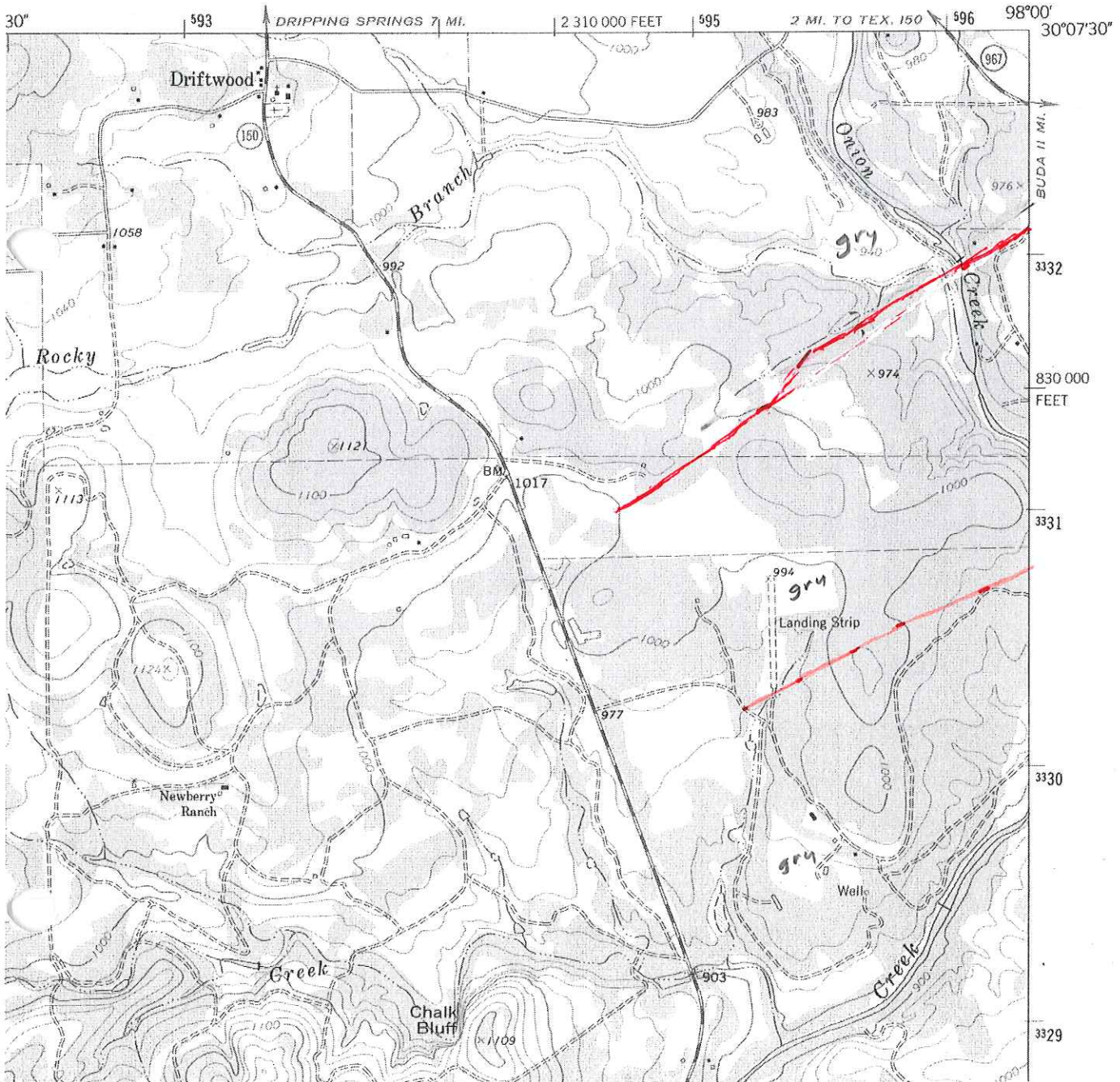
Attachment C.

Geologic Map Segments for Tier 2



DRIFTWOOD QUADRANGLE  
TEXAS-HAYS CO.  
7.5 MINUTE SERIES (TOPOGRAPHIC)

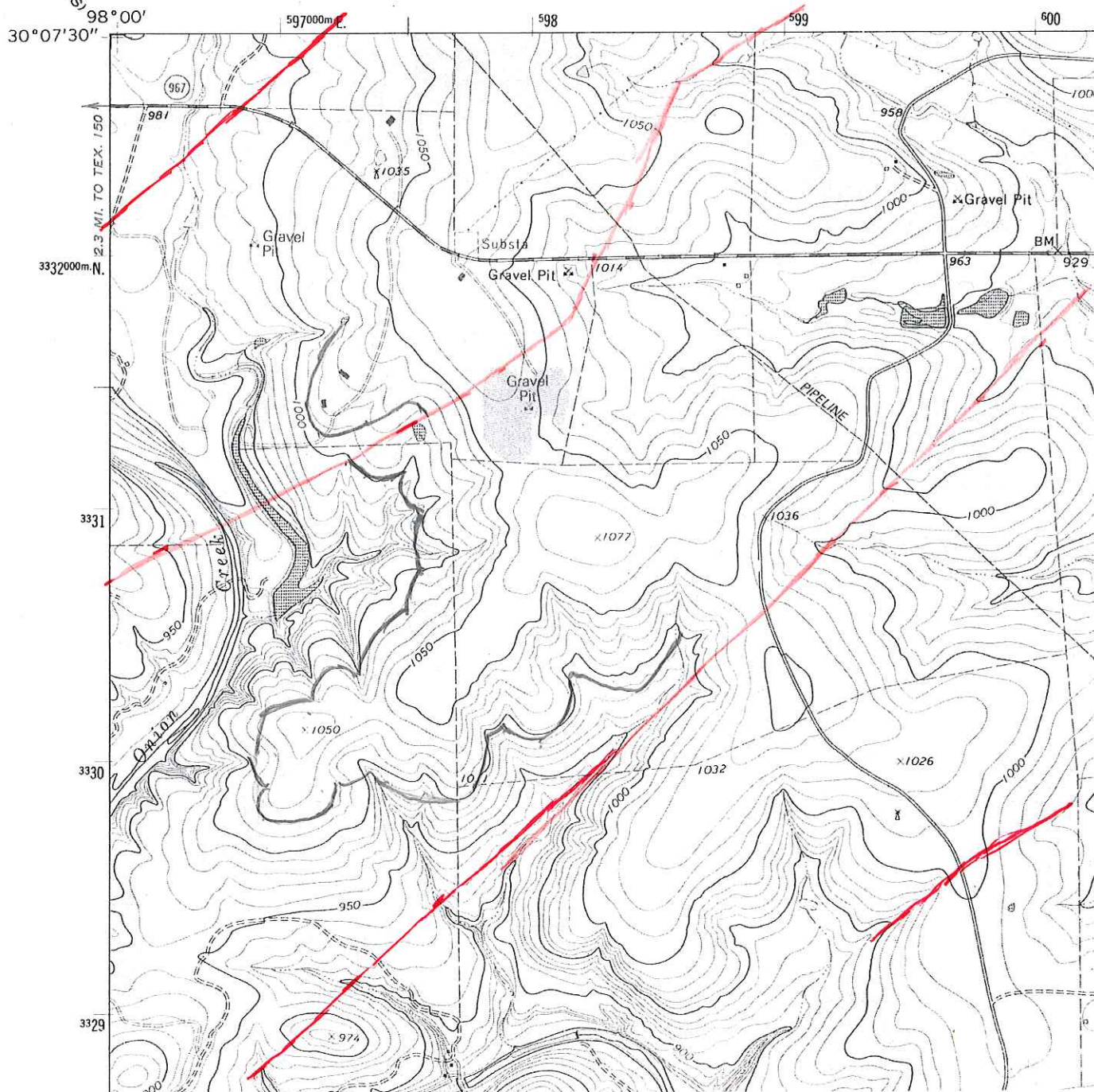
6444 111  
(BUDA 1:62500)



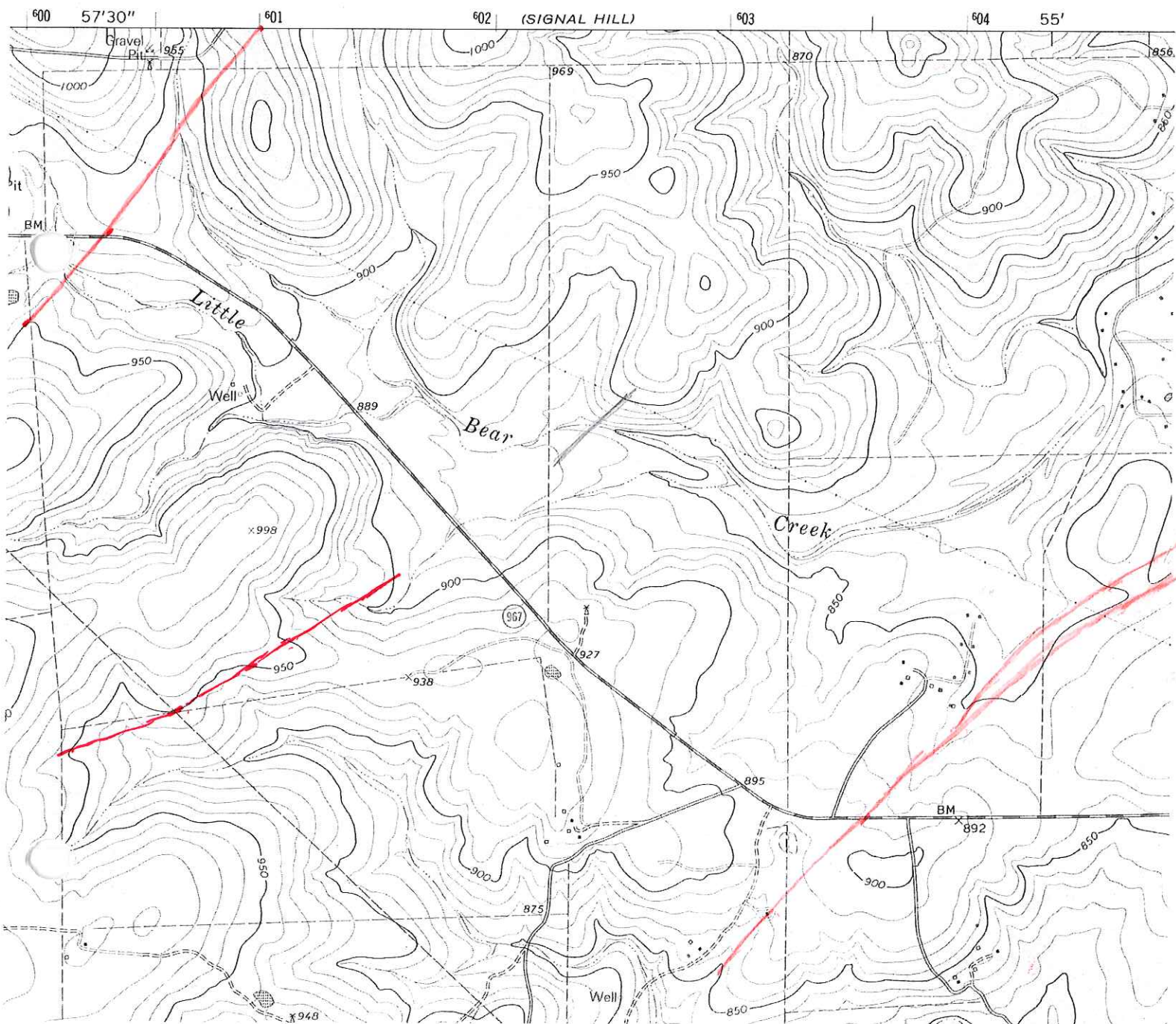


(DRIPPING SPRINGS)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY



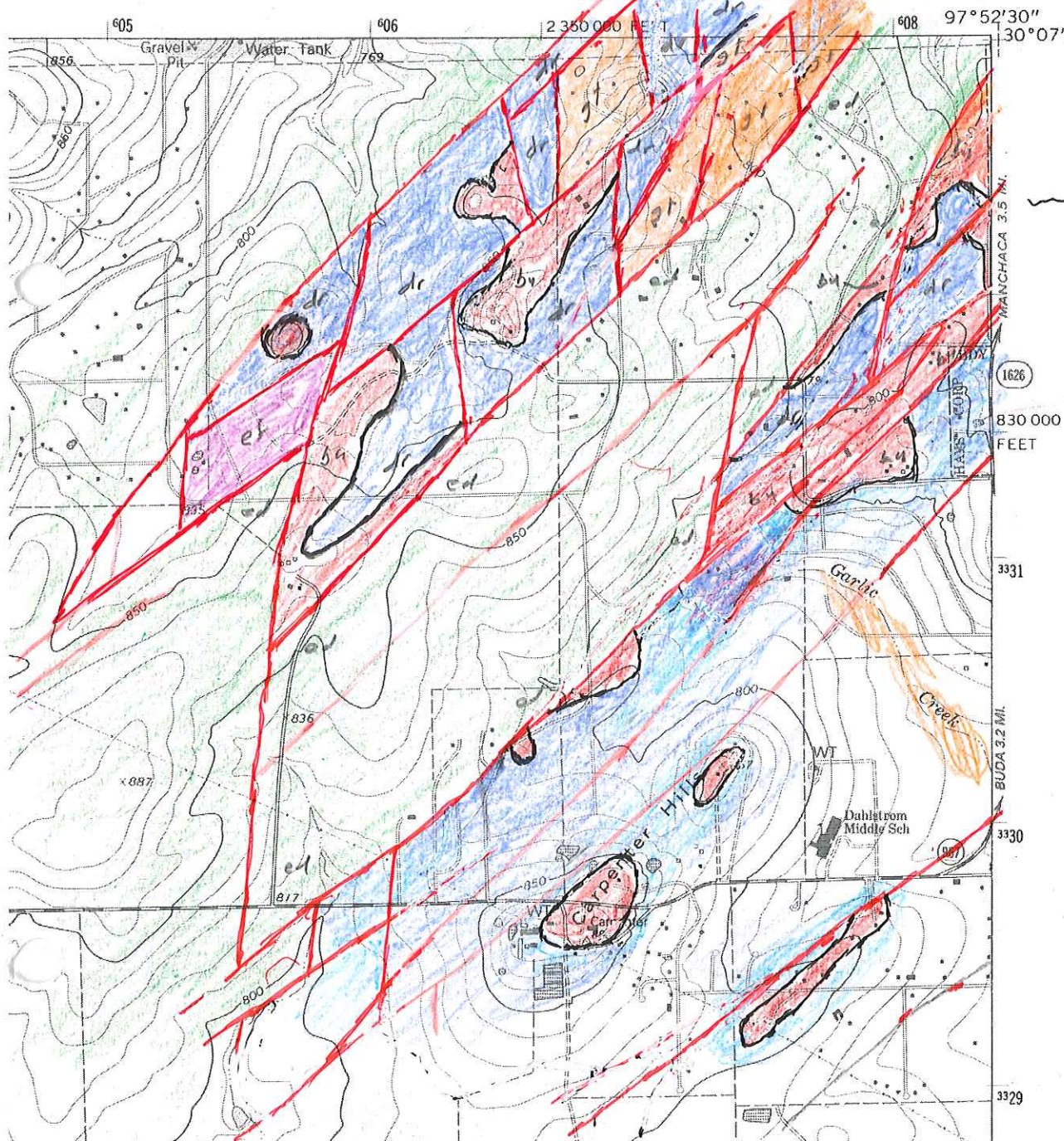






MOUNTAIN CITY QUADRANGLE  
TEXAS-HAYS CO.  
7.5 MINUTE SERIES (TOPOGRAPHIC)

(OAK HILL)

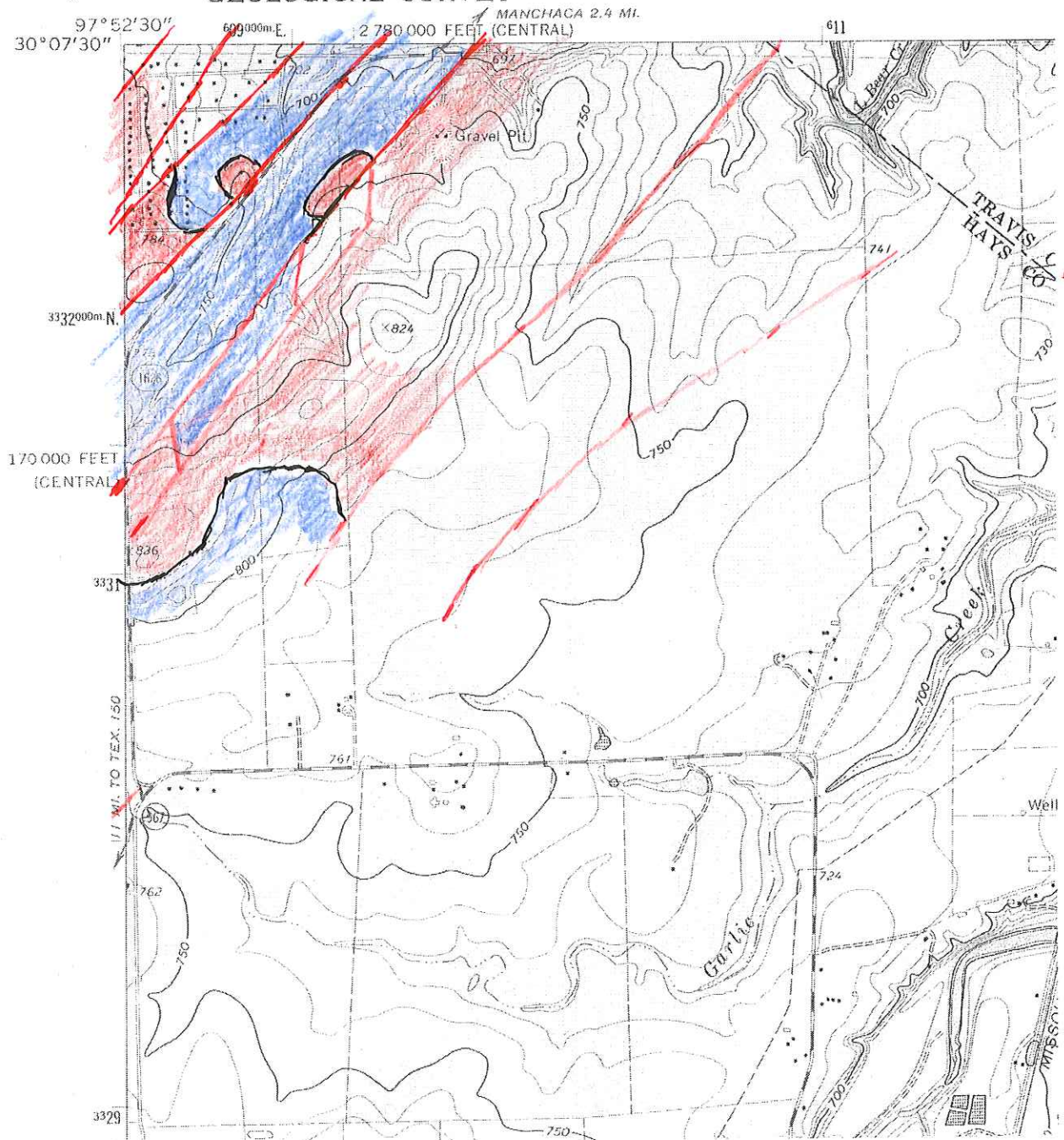




Buda (NW)

6444 (1) NW  
(SIGNAL HILL)

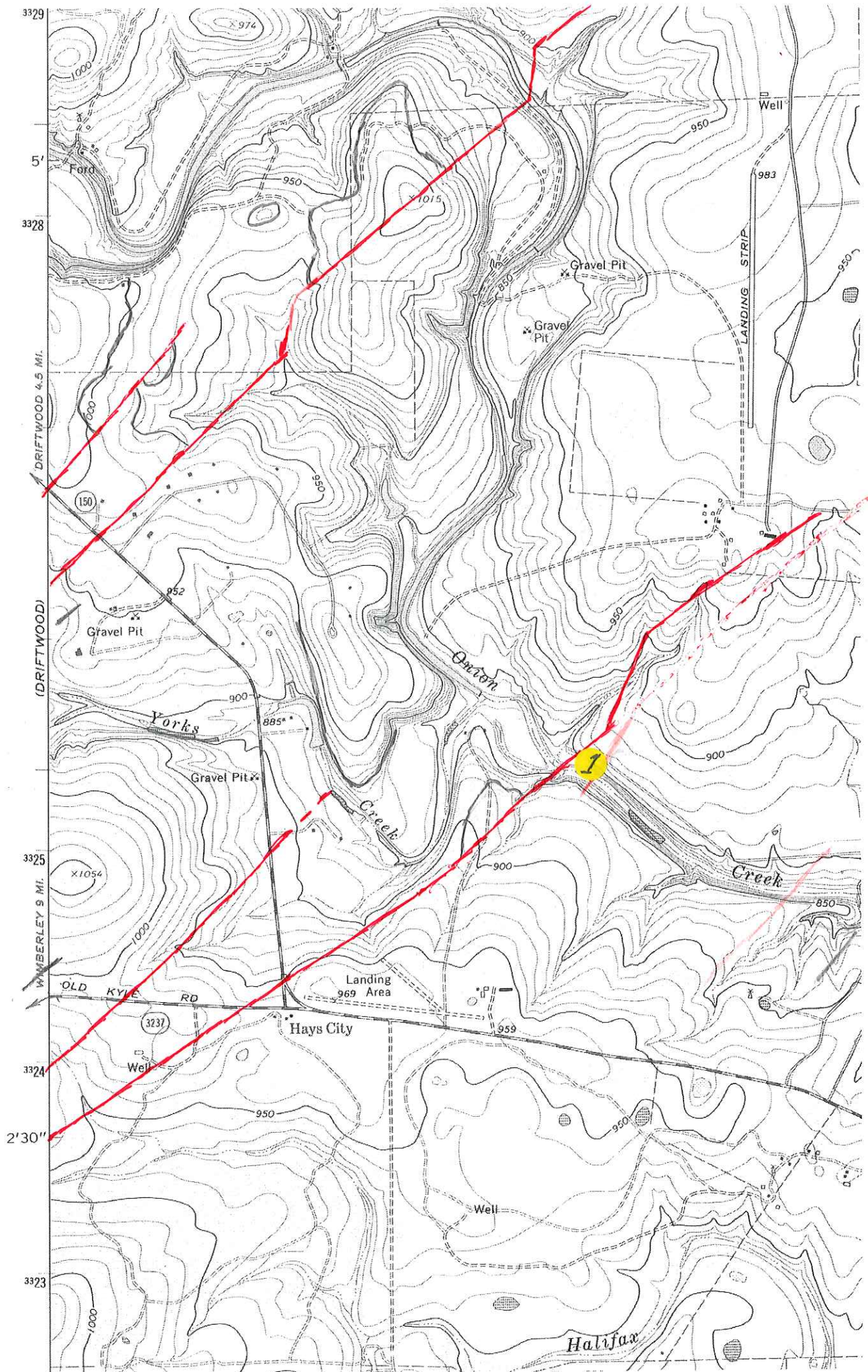
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY



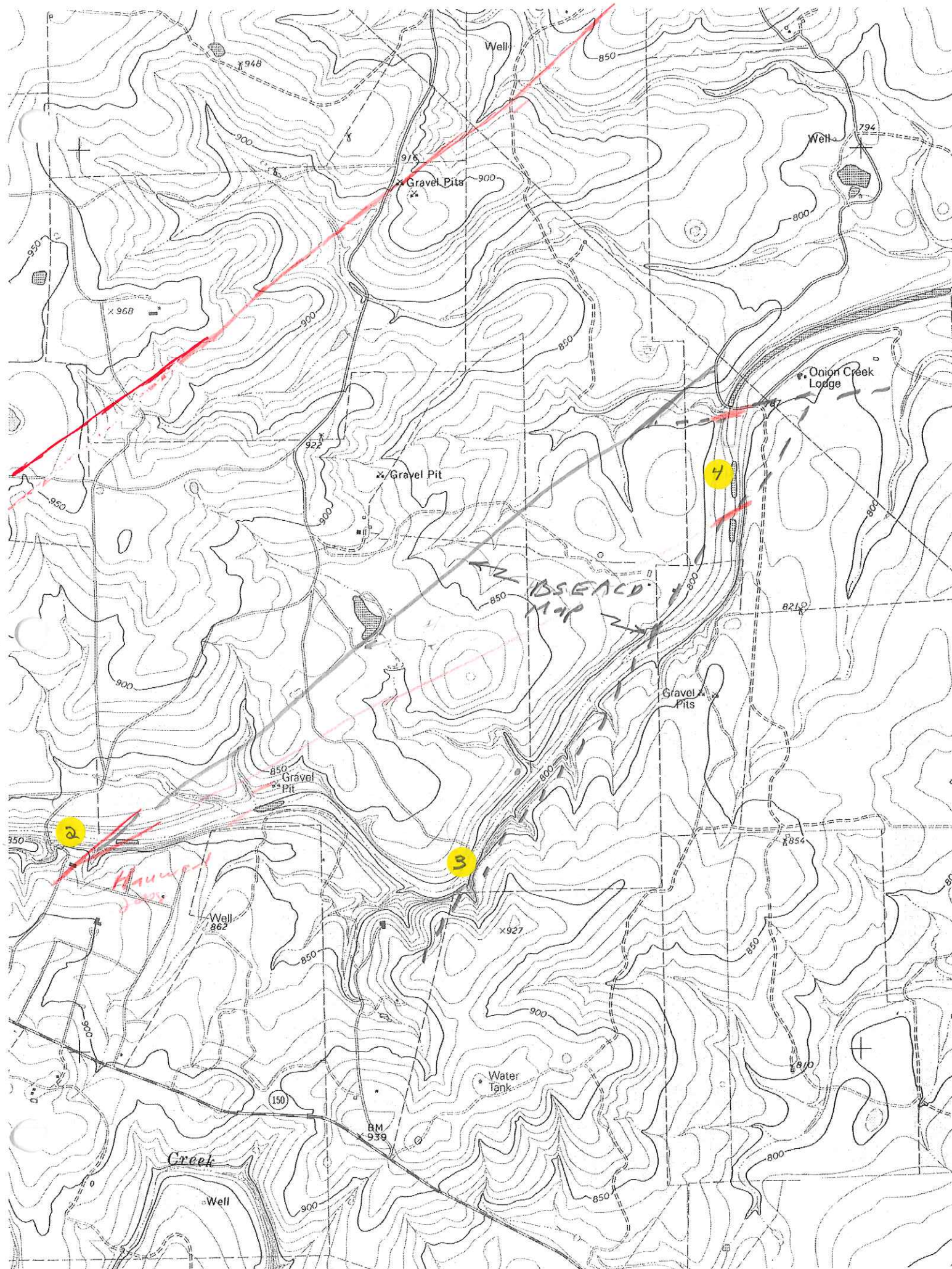
Attachment D.

Geologic Map Segments for Tier 3

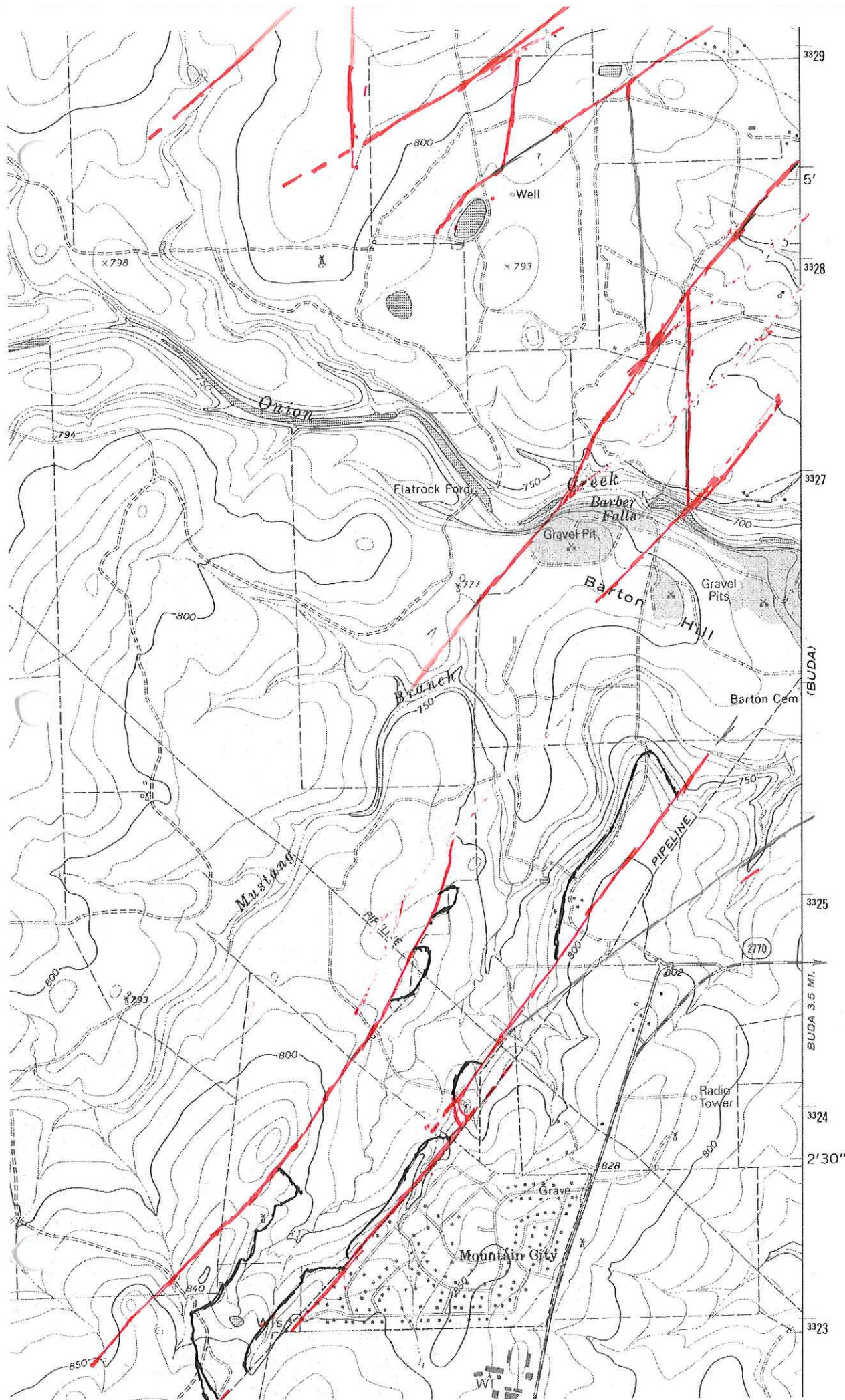








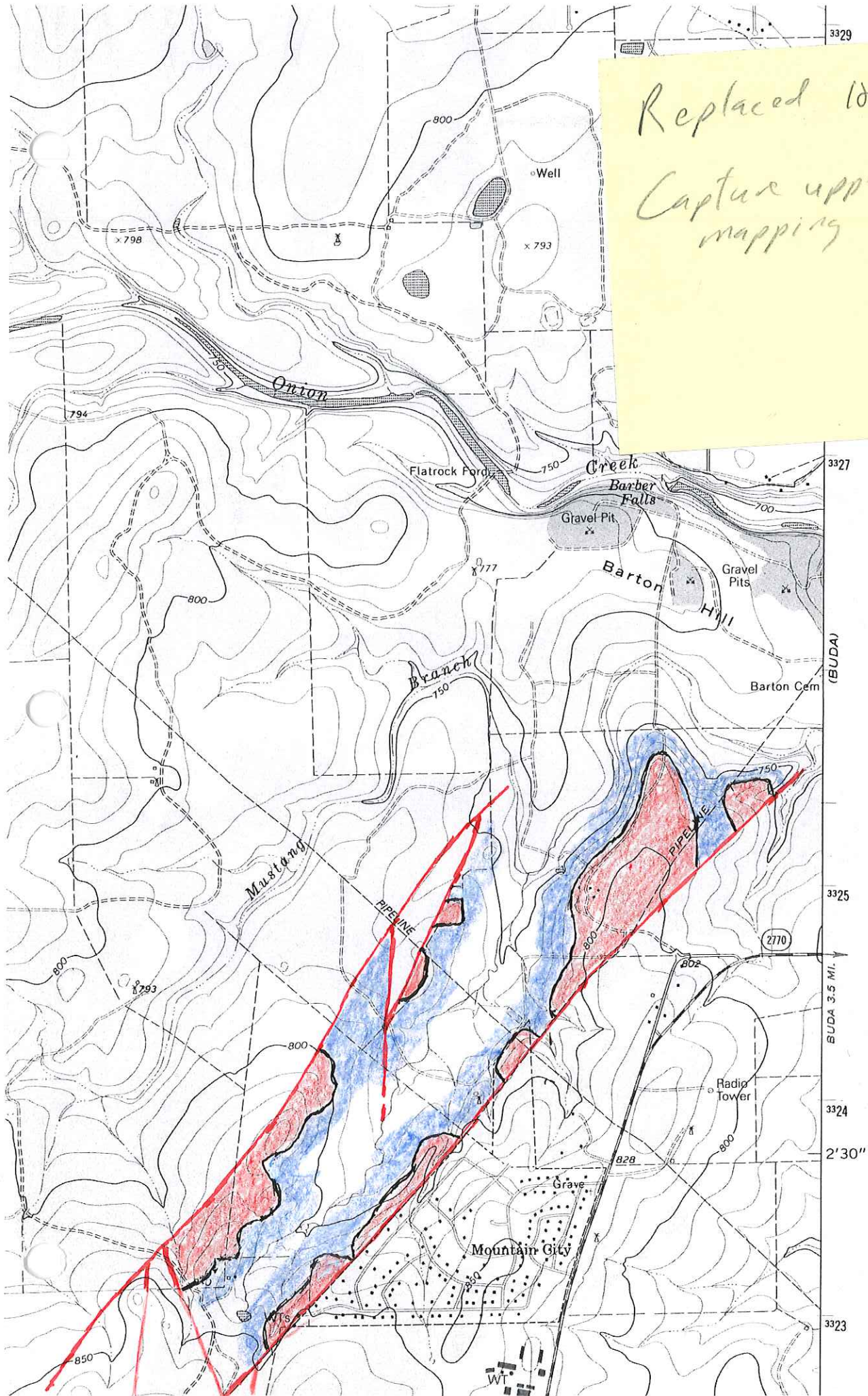






Replaced 10/27/15

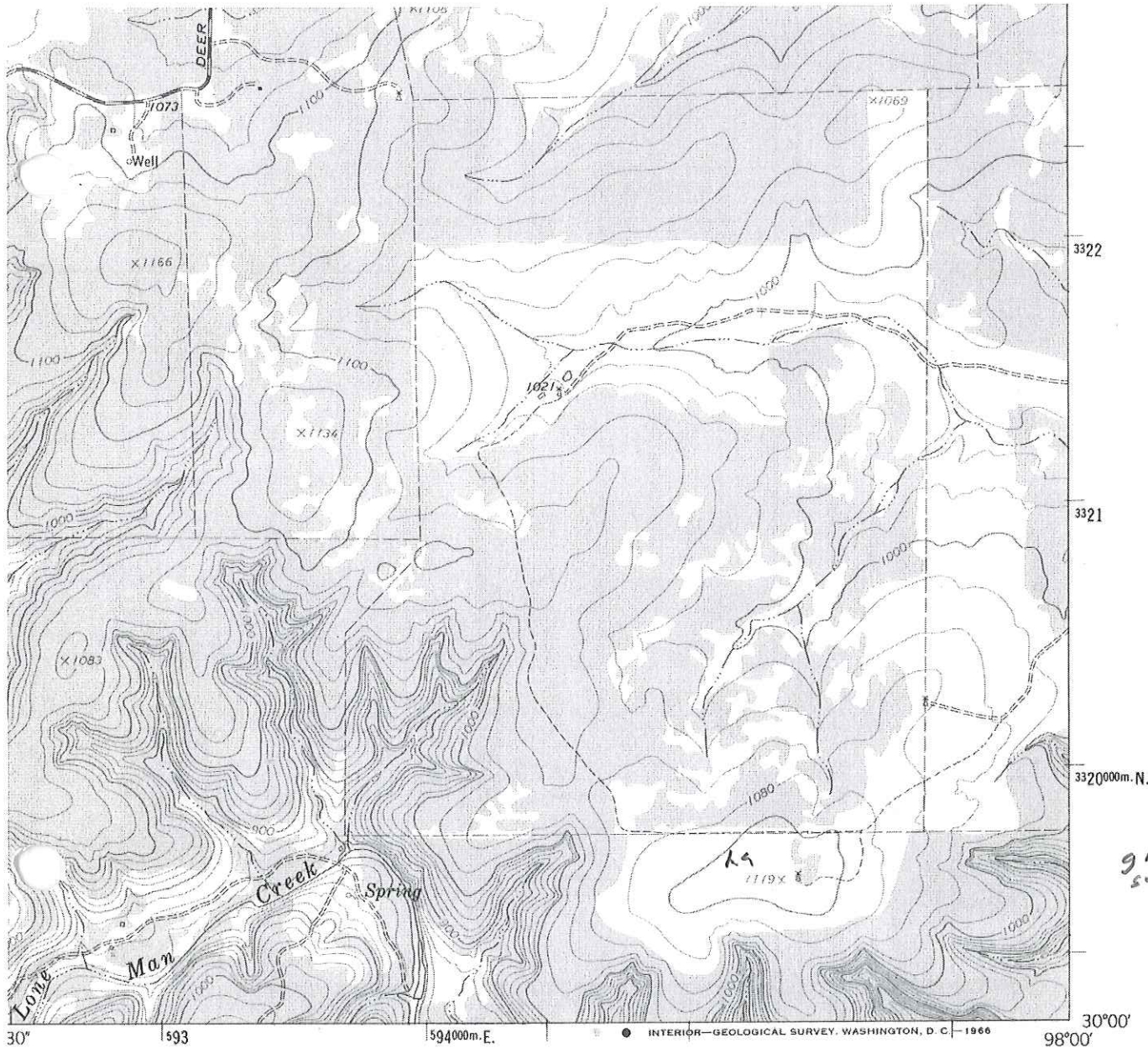
Capture upper  
mapping



Attachment E.

Geologic Map Segments for Tier 4





# ROAD CLASSIFICATION

Medium-duty ——— Light-duty ———

Unimproved dirt =====

○ State Route



QUADRANGLE LOCATION

U.S.G.S.  
FILE COPY  
TOPOGRAPHIC DIVISION

DRIFTWOOD, TEX.  
N3000-W9800/7.5

1964

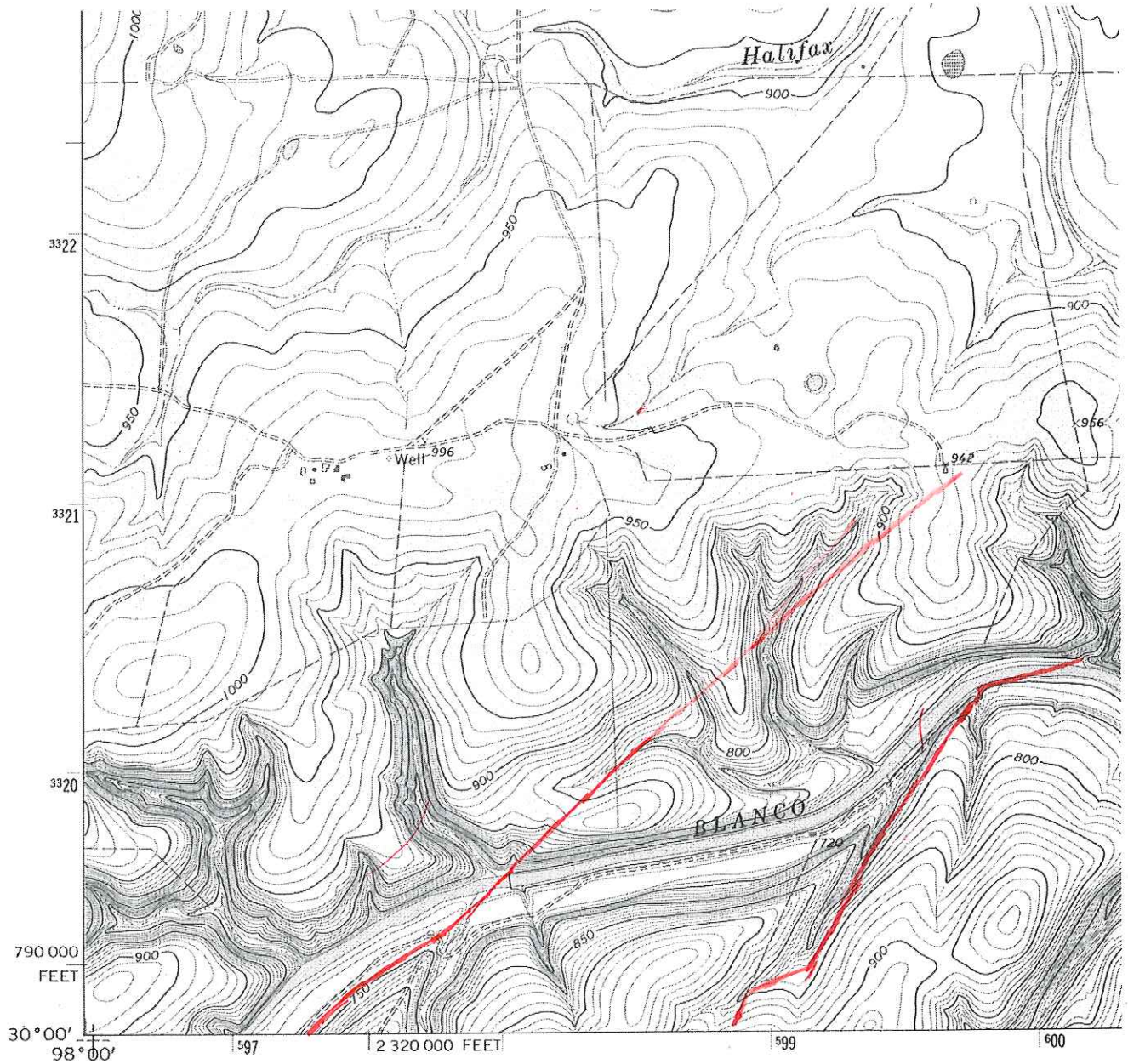
AMS 6344 II SE-SERIES V882

(SAN MARCOS NORTH)  
6443 IV NW

2850

MAR 9 1966





(WIMBERLEY)

Produced by the United States Geological Survey

Control by USGS and NOS/NOAA

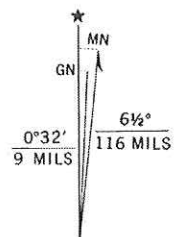
Compiled from aerial photographs taken 1967. Revisions shown in purple compiled from aerial photographs taken 1986 and other sources and have been field checked. Map edited 1994. Conflicts may exist between some updated features and previously mapped contours.

North American Datum of 1927 (NAD 27). Projection and 10000-foot ticks: Texas Coordinate System, south central zone (Lambert Conformal Conic)

Blue 1000-meter Universal Transverse Mercator ticks, zone 14

North American Datum of 1983 (NAD 83) is shown by dashed corner ticks. The values of the shift between NAD 27 and NAD 83 for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software

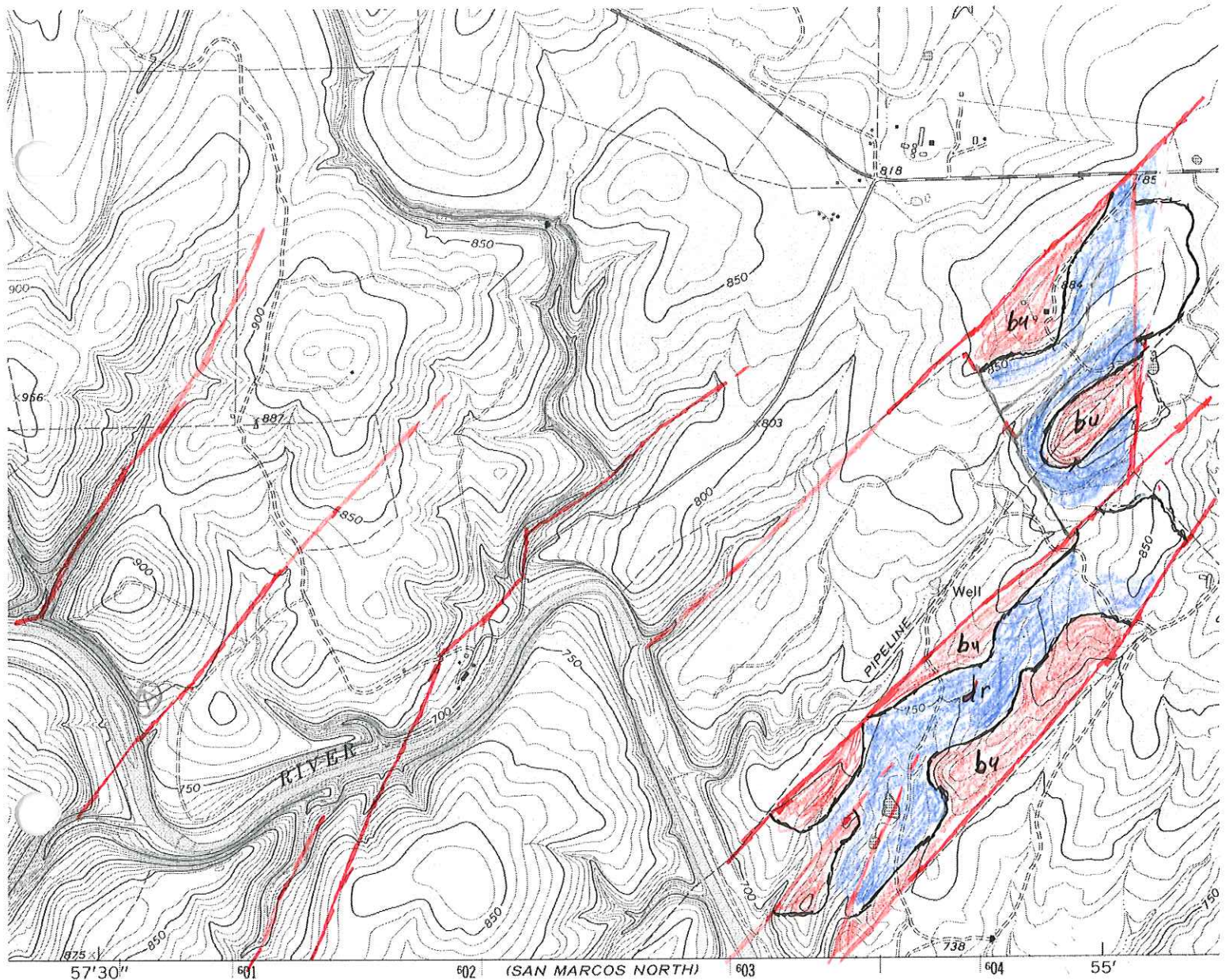
Areas covered by dashed light blue pattern are subject to controlled inundation



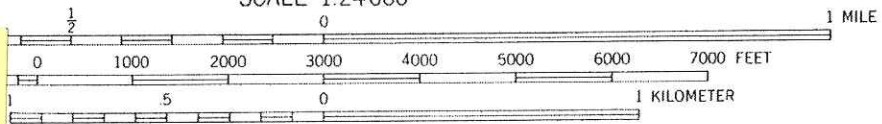
UTM GRID AND 1994 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

11/6/16  
 - Add Kgr, Nuv Kgr  
 in Blanco trench  
 - From Twb 1976 + Collins  
 - Kgr up to (A) next sheet





SCALE 1:24 000

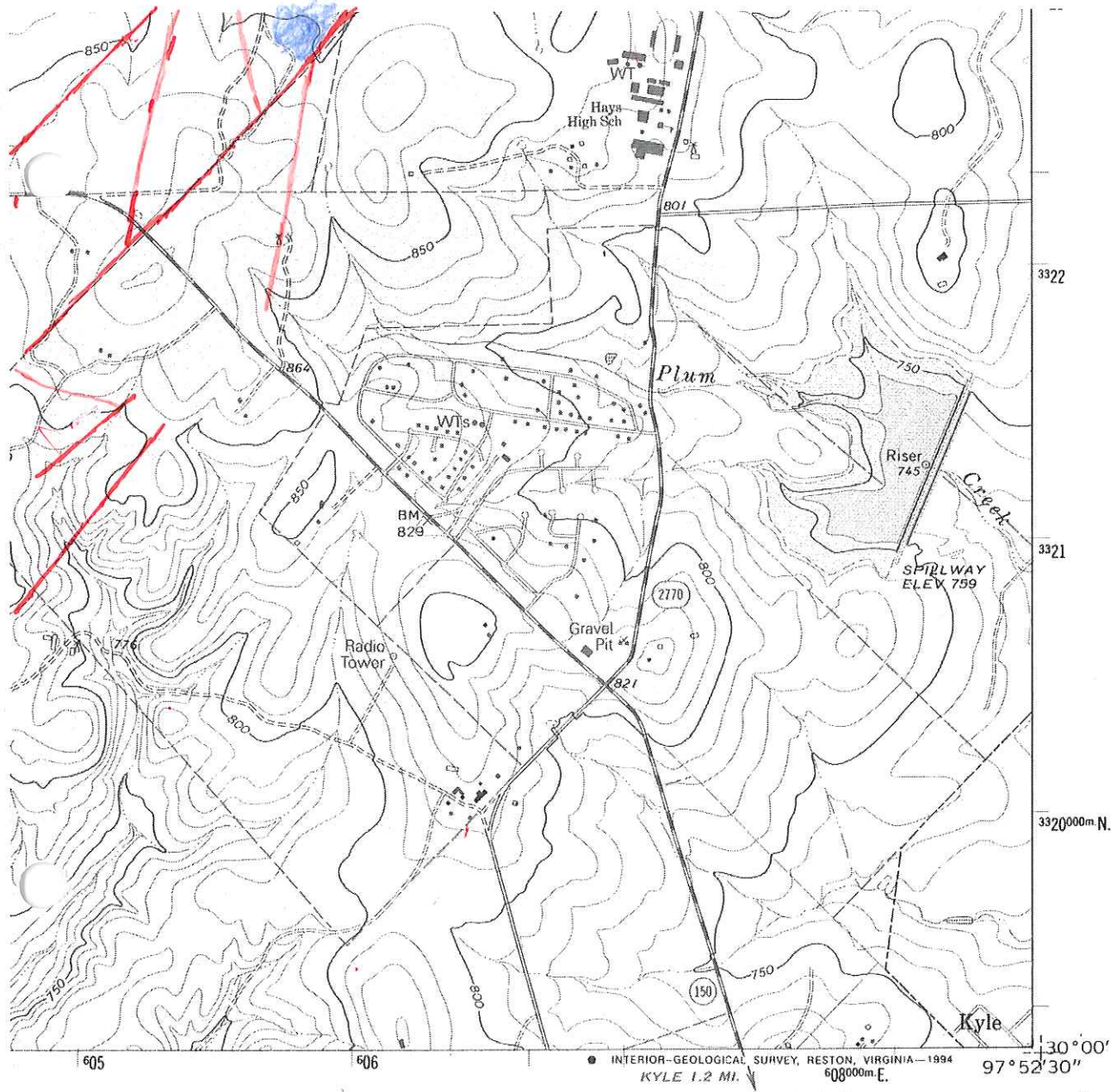


CONTOUR INTERVAL 10 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS  
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 2209.  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

1/6/16  
- Kgr against Med  
at (A)








ROAD CLASSIFICATION

Primary highway, hard surface \_\_\_\_\_ Light-duty road, hard or improved surface \_\_\_\_\_

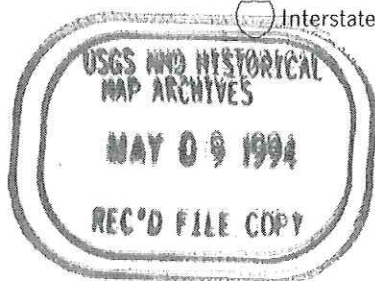
Secondary highway,  
hard surface .....  Unimproved road ..... 

 Interstate Route    U. S. Route    State Route



QUADRANGLE LOCATION

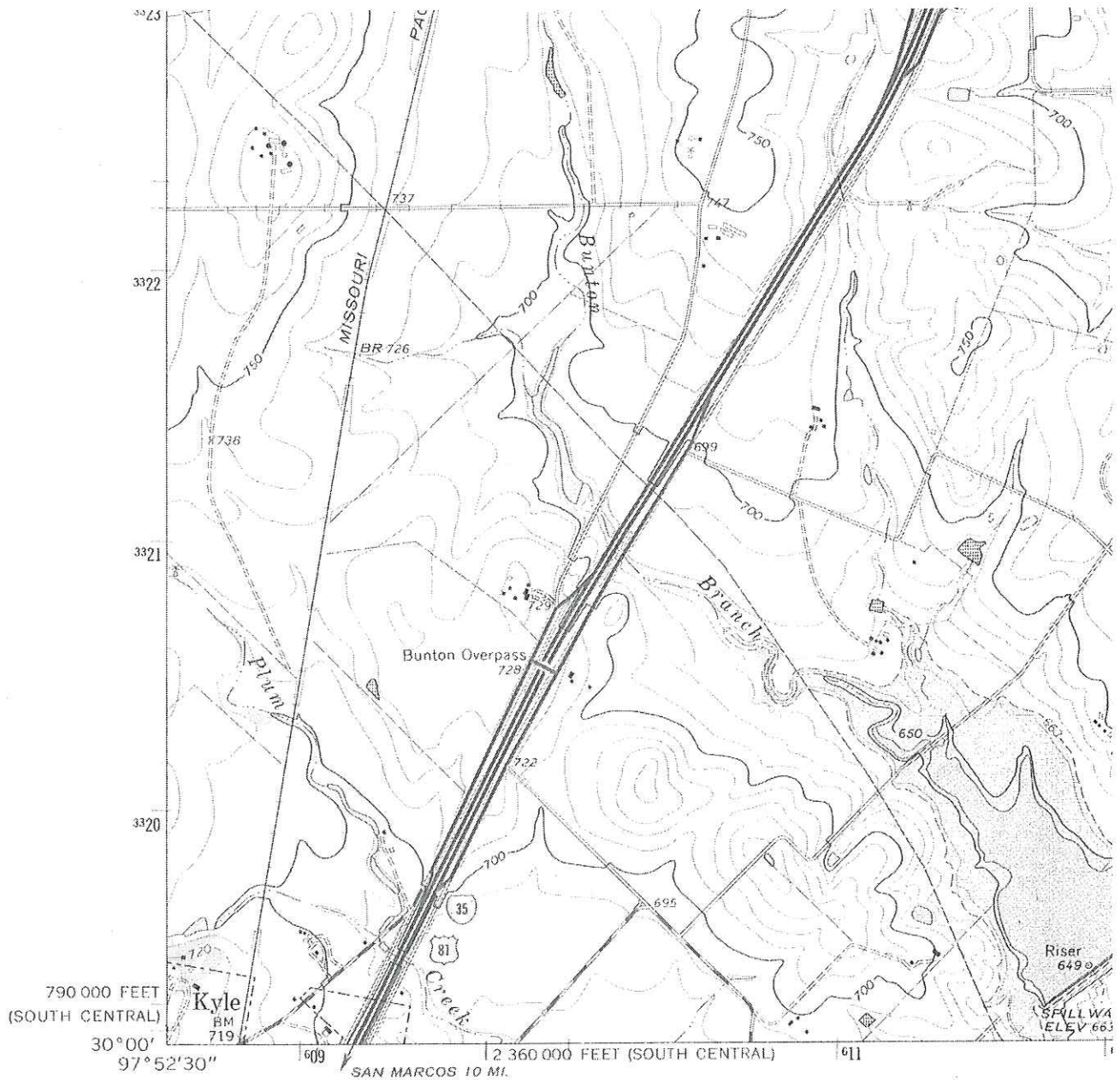
3097-222



MOUNTAIN CITY, TEX.

30097-A8-TF-024

1968  
REVISED 1994  
DMA 6444 III SW-SERIES V882



(SAN MARCOS NORTH)  
6443 IV NW

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1967. Field checked 1968

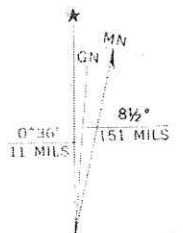
Polyconic projection. 1927 North American datum  
10,000-foot grids based on Texas coordinate system,  
south central and central zones

1000-meter Universal Transverse Mercator grid ticks,  
zone 14, shown in blue

Fine red dashed lines indicate selected fence lines

Areas covered by dashed light-blue pattern are subject to  
controlled inundation

Revisions shown in purple compiled from aerial photographs  
taken 1973. This information not field checked



UTM GRID AND 1973 MAGNETIC NO  
DECLINATION AT CENTER OF SHEET

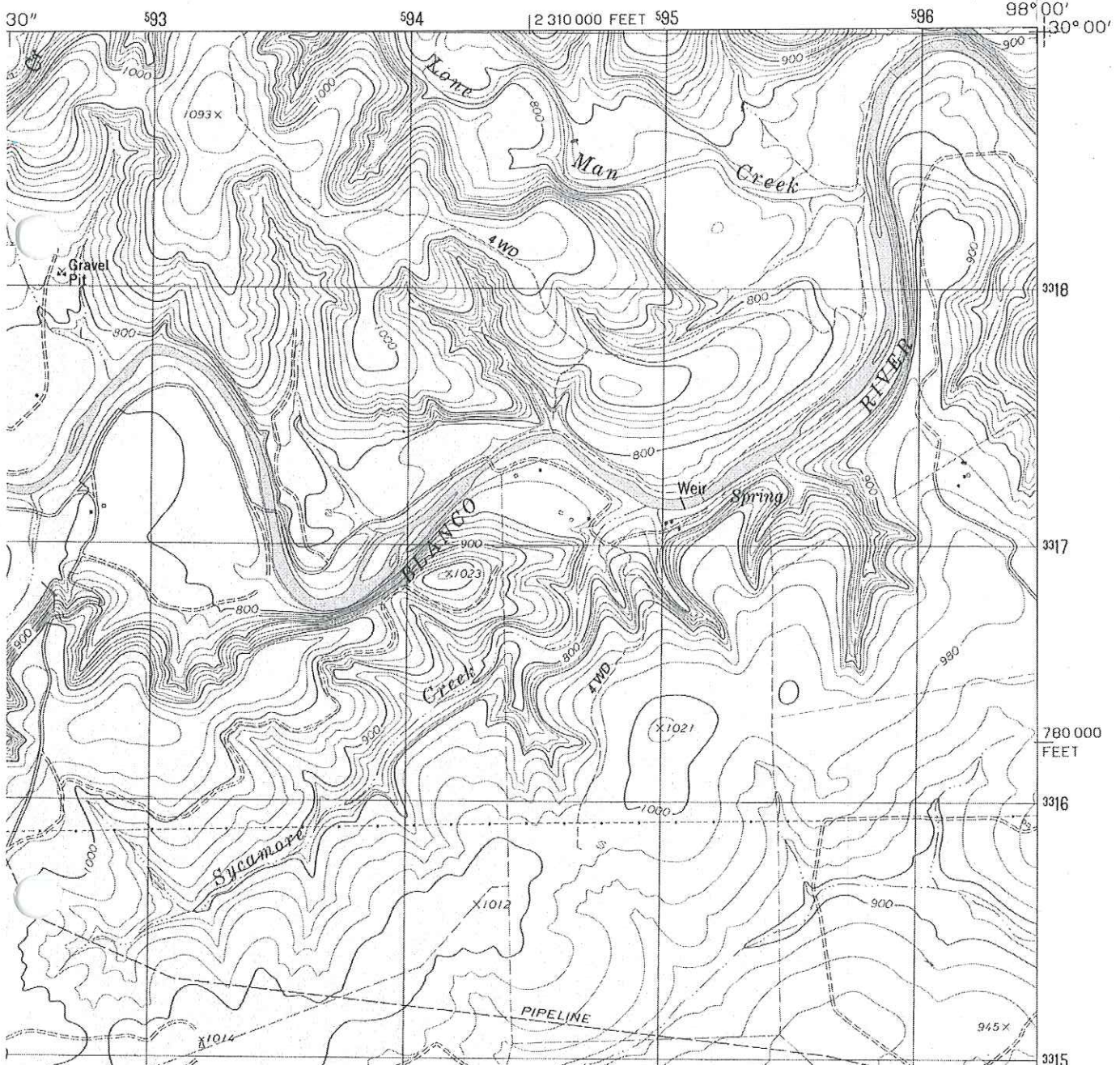
Buda (SW)

Attachment F.  
Geologic Map Segments for Tier 5



WIMBERLEY QUADRANGLE  
TEXAS  
7.5 MINUTE SERIES (TOPOGRAPHIC)

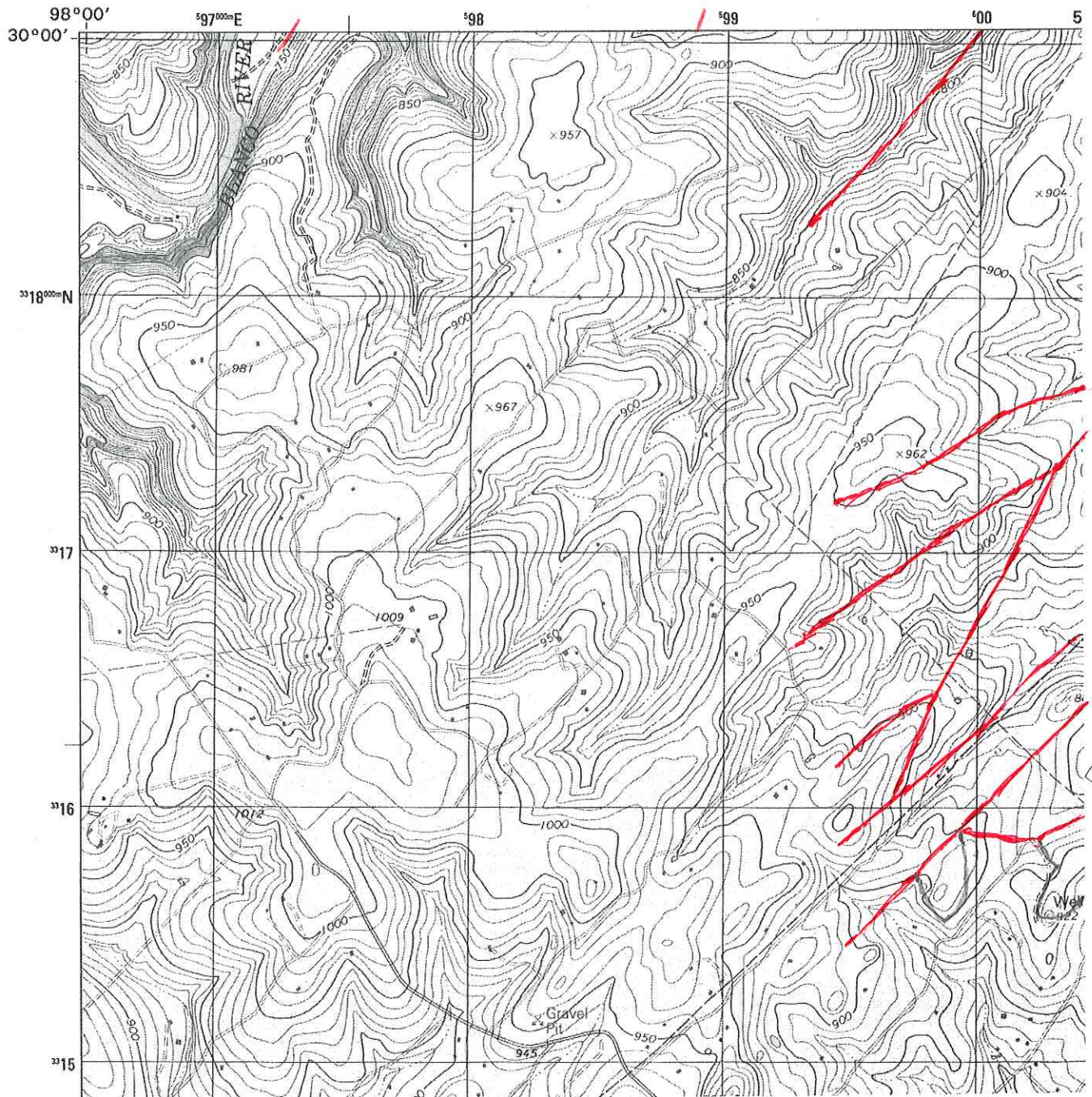
6444 III SW  
(MOUNTAIN CITY)



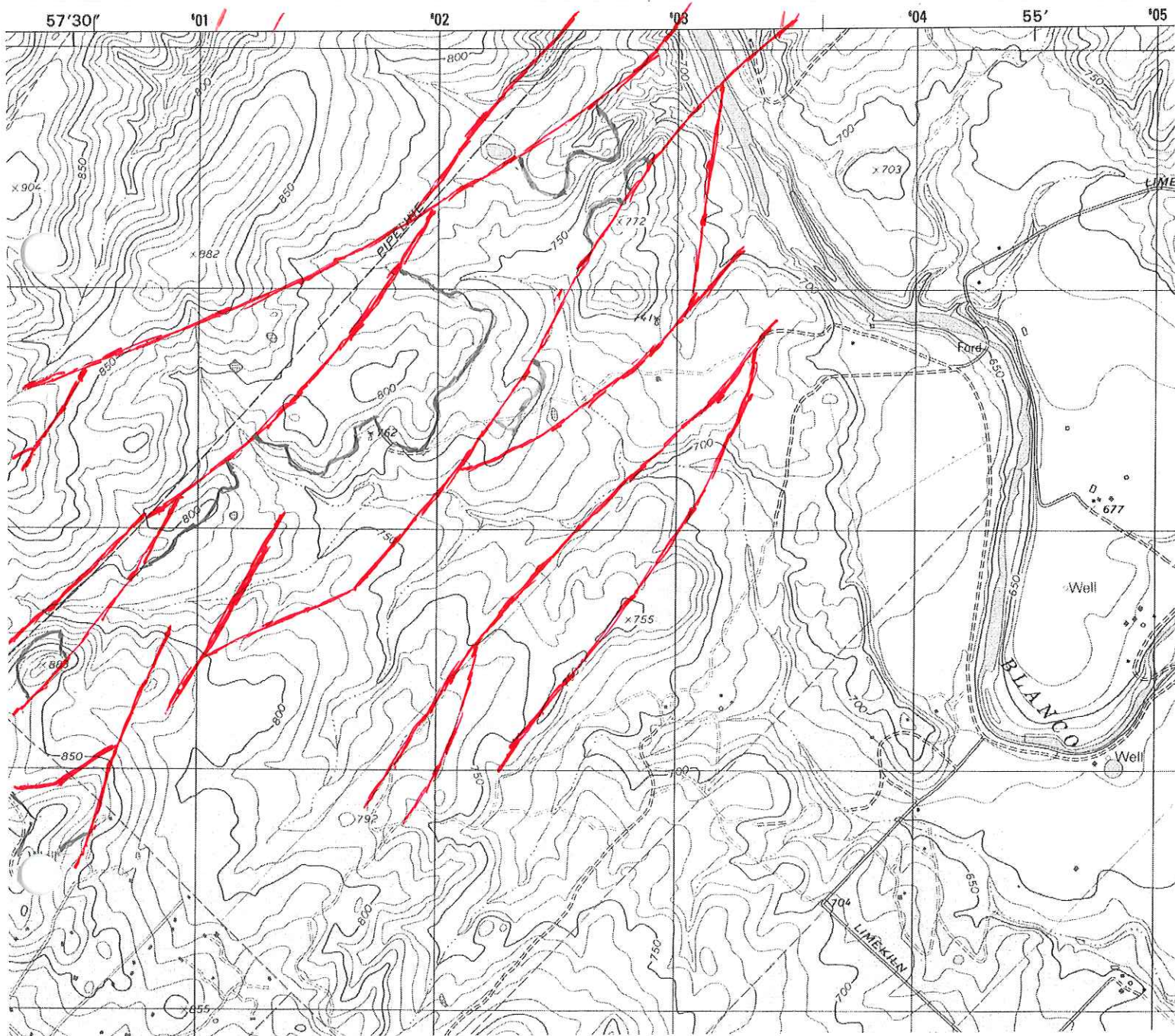




U.S. DEPARTMENT OF THE INTERIOR  
U.S. GEOLOGICAL SURVEY



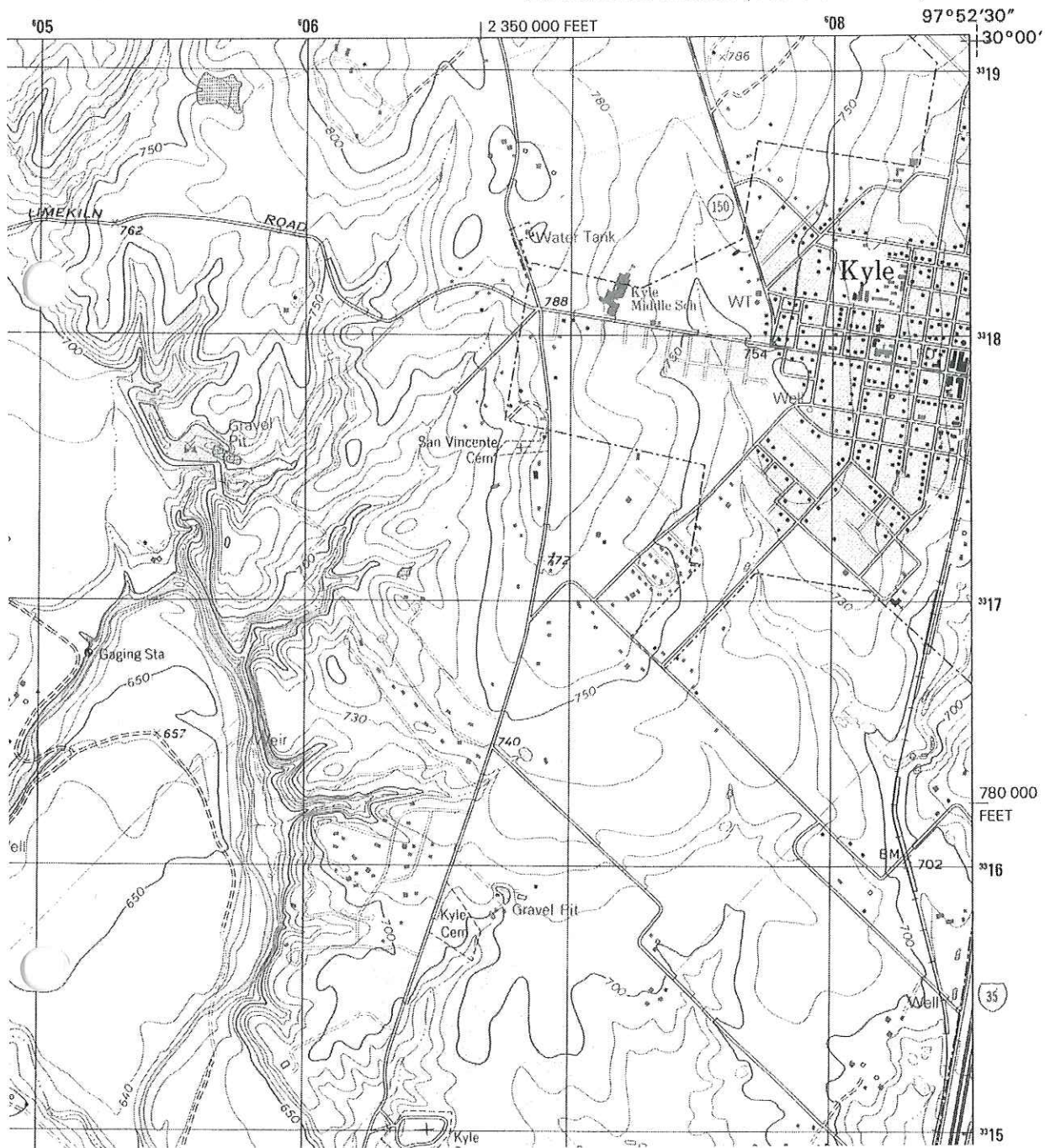






Original

SAN MARCOS NORTH QUADRANGLE  
TEXAS  
7.5-MINUTE SERIES (TOPOGRAPHIC)





6444 111  
(BUDA 1:62500)

This topographic map depicts the Kyle area in Texas. Key features include:
 

- Topography:** Contour lines indicating elevations from 640 to 720 feet. A prominent spillway is marked with an elevation of 660 feet.
- Water Features:** Plum Creek and a smaller creek labeled 'Creek' are shown.
- Infrastructure:** Highway 35 runs vertically through the center. Other roads include Driftwood 15 MI, Austin 21 MI, and San Antonio 57 MI.
- Landmarks:** Kyle, a gravel pit, a well (elevation 622), and a riser (elevation 654) are labeled.
- Coordinates:** The map is bounded by 97°52'30" W and 30°00' N.