

# **FIELD GEOLOGY MAPS**

## **CRAWFORD COUNTY, KANSAS**

**Preliminary Field Geology Maps for**

**GRINDSTONE CREEK  
McCUNE  
McCUNE NE  
WEST MINERAL**

**1:24,000-Scale Quadrangles**

**Ronald R. West and Robert S. Sawin**

**Kansas Geological Survey  
Open-file Report 2002-18**

# **CRAWFORD COUNTY, KANSAS**

## **INDEX TO 1:24,000-SCALE MAPS**

Copies of the field maps are open-filed at the Kansas Geological Survey, Lawrence, Kansas.

## LEGEND

IT IS IMPORTANT TO NOTE THAT THESE MAPS INDICATE LITHOSTRATIGRAPHIC UNITS ONLY. NO TEMPORAL, GENETIC, OR RELATED DEPOSITIONAL ASPECTS ARE MEANT OR IMPLIED.

The stratigraphic sequence in this report extends from the upper part of the Cherokee Group to the Altamont Limestone (Marmaton Group). Overlying these Pennsylvanian rocks are Quaternary alluvium and terrace deposits that are mapped as Qal.

Terminology on the left side of the Composite Lithologic Sequence is that of Zeller (1968), with one exception. The Holdenville Shale has been divided into the Memorial Shale below and the Lost Branch Formation above (Heckel, 1991).

On the right side of the graphic column are the units shown on the maps.

The following lithostratigraphic contacts, from lowest to highest, were mapped in the Crawford County quadrangles of this report:

- Top of Verdigris Limestone Member (Cabaniss Formation)
- Top of Cabaniss Formation/base of Fort Scott Limestone
- Top of Fort Scott Limestone /base of Labette Shale
- Top of Anna Shale Member/base of Myrick Station Limestone Member (Pawnee Limestone)\*
- Top of Laberdie Limestone Member (Pawnee Limestone)/base of Bandera Shale
- Top of Bandera Shale/base of Altamont Limestone

**Qal** = alluvial deposits were mapped using the Soil Survey of Crawford County, Kansas (Rott, 1973). Holocene alluvial deposits five feet or greater in thickness were included in this unit. Alluvial deposits include sand, gravel, silt, and clay that was deposited on floodplains by streams, creeks, and rivers.

**Ptc** = coal strip pit

**Ptl** = limestone quarry

**Ptss** = sandstone quarry

**Ptel** = clay pit

**Ptg** - gravel pit

\* Stratigraphically the Anna Shale Member is recognized as the basal member of the Pawnee Limestone, however, our studies do not support the mappability of the base of the Anna Shale Member (Pawnee Limestone)/ top of the Labette Shale. We found the thickness of the Anna to be variable, sometimes absent, and often underlain by a black to very dark gray mudrock/shale of the uppermost Labette, making a reliable (i.e. mappable) contact questionable at best. Since formations are defined by the North American Code of Stratigraphic Nomenclature as mappable lithostratigraphic units, we would propose that the Pawnee Limestone be defined to exclude the Anna and that the Anna be included in the Labette Shale.





## REFERENCES

Rott, D.E., Swanson, D.W., and Jorgensen, G.N., Jr., 1973, Soil Survey of Crawford County, Kansas: U.S. Department of Agriculture, Soil Conservation Service and Kansas Agricultural Experiment Station, 50 p., 48 maps.

Jewett, J. M., 1945, Stratigraphy of the Marmaton Group, Pennsylvanian, in Kansas: Kansas Geological Survey Bulletin 58, 148 p.

Heckel, P. H., 1991, Lost Branch Formation and Revision of Upper Desmoinesian Stratigraphy along Midcontinent Pennsylvanian Outcrop Belt: Kansas Geological Survey Geology Series 4, 67 p.

Howe, W. B., 1956, Stratigraphy of Pre-Marmaton Desmoinesian (Cherokee) Rocks in Southeastern Kansas: Kansas Geological Survey Bulletin 123, 132 p.

Zeller, D. N., 1968, The Stratigraphic Succession in Kansas: Kansas Geological Survey Bulletin 189, 81 p.

## GRINDSTONE CREEK QUADRANGLE

EXPLANATION - CONTROL POINTS FOR THE CRAWFORD COUNTY MAP ARE IDENTIFIED AS FOLLOWS:

(1) NUMBERS PRECEDED BY THE LETTER C REFER TO MEASURED SECTIONS IN THE CRAWFORD COUNTY, KANSAS BOOKS IN THE FILES OF THE KANSAS GEOLOGICAL SURVEY, NUMBERING BEGAN AT FIRST SECTION IN THE BOOK AND PRECEDED SEQUENTIALLY TO THE LAST SECTION;

(2) NUMBERS PRECEDED BY THE LETTER L REFER TO SITES FROM WHICH I HAVE COLLECTED GEOLOGICAL SPECIMENS; AND

(3) NUMBERS PRECEDED BY THE LETTERS CR ARE SITES EXAMINED AND EVALUATED SPECIFICALLY FOR THIS MAPPING PROJECT.

OBVIOUSLY, ANY GIVEN SITE MAY BE IDENTIFIED BY ANY ONE, TWO, OR ALL THREE OF THESE DESIGNATIONS.

C-36 = SW1/4, SW1/4, SE1/4, Sec. 36, T.29S., R.22E., Crawford Co., Kansas; Pawnee Limestone according to Jewett, 1940.

C-52 = SE1/4, Sec. 36, T.30S., R.22E., Crawford Co., Kansas; Breezy Hill limestone and underlying sandstone according to Howe, 1949.

C-53 = SE1/4, SE1/4, Sec. 12, T.30S., R.22E., Crawford Co., Kansas; Stark's (Niggerman's) Quarry; Fort Scott Limestone; Quarry of Suchy's thesis; L-700.

C-54 = same as CR-53

C-55 = SE1/4, NE1/4, Sec. 27, T.30S., R.23E., Crawford Co., Kansas; sandstone with black limestone septarian concretions according to Howe, 1949.

CR-152 = Exposure in a field along North bank of Lightning Creek of interval similar to that seen at C-37 (Labette Shale); 500 feet north and 300 feet West of the SE cor., Sec.20, T.29S., R.23E., Crawford Co., Kansas.

CR-153 = Sandstone (Englevale) in road ditch on North side of road; near Center of South line of Sec. 20, T.29 T.29S., R.23E., Crawford Co., Kansas.

CR-154 = Top of Anna base of Pawnee (Myrick Station) Limestone in drainage on North side of road at 939 feet; approximately 800 feet West of the SE cor., Sec. 19, T.29S., R.23E., Crawford Co., Kansas.

CR-155 = Loose blocks, float, of Myrick Station limestone in ditch on South side of road; near Center of North line of Sec. 30, T.29S., R.23E., Crawford Co., Kansas.

CR-156 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at change in road grade at 930 feet; approximately 1100 feet East of SW cor., Sec. 19, T.29S., R.23E., Crawford Co., Kansas; same as Jewett's C-38.

CR-160 = Sandstone (Bandera) in road; near Center of South line of SE1/4, SW1/4, SW1/4, Sec. 22, T.29S., R.22E., Crawford Co., Kansas.

CR-161 = Sandstone (Bandera) in road; approximately 400 feet South of NW cor., Sec. 27, T.29S., R.22E., Crawford Co. Kansas.

CR-372 = Sandstone (Bandera) in road; near SW cor., Sec. 27, T.29S., R.22E., Crawford Co., Kansas.

- CR-373 = Sandstone (Bandera) in drainage West of road; approx. 400 feet North and 200 feet West of Center of East line, Sec. 28, T.29S., R.22E., Crawford Co., Kansas.
- CR-374 = Sandstone (Bandera) just West of road; near Center of East line, NE1/4, SE1/4, Sec. 28, T.29S., R.22E., Crawford Co., Kansas.
- CR-375 = Sandstone (Bandera) in road at @ 1000'; approx. 100 feet West of Center of South line, Sec. 27, T.29S., R.22E., Crawford Co., Kansas.
- CR-376 = Mudrock (Labette?) in road and drainage North of road; approx. 300 feet East of Center of South line, SW1/4, SE1/4, Sec. 30, T.29S., R.23E., Crawford Co., Kansas.
- CR-377 = Thin bedded, in situ sandstone (Labette?) in stream just South of road; Approx. 800 feet West and 200 South of Center of North line, Sec. 31, T.29S., R.23E., Crawford Co., Kansas.
- CR-377A = Limestone blocks from Myrick Station limestone used as fill along road ditch on North side of road; near Center of South line, SE1/4, SW1/4, Sec. 30, T.29S., R.23E., Crawford Co., Kansas.
- CR-377B = Sandy to silty mudrock (Labette?) in road ditch on South side of road; approx. 300 feet East of Center of North line, NE1/4, NW1/4, Sec. 31, T.29S., R.23E., Crawford Co., Kansas.
- CR-378 = Sandstone in place in field on East side of road; just East of Center of West line, NW1/4, SW1/4, Sec. 30, T.29S., R.23E., Crawford Co., Kansas.
- CR-379 = Sandy to silty mudrock (Labette?) in creek bank on East side of road; Approx. 400 feet North and 50 feet East of Center of west line, Sec. 30, T.29S., R.23E., Crawford Co., Kansas.
- CR-380 = Sandy to silty mudrock (Labette?) in drainage on West side of road; near NW cor., Sec. 31, T.29S., R.23E., Crawford Co., Kansas.
- CR-381 = Possible contact between Anna shale and Myrick Station (Pawnee) limestone at 940' in road ditch an field on both sides of road; approx. 200 feet South of Center of West line, SE1/4, NE1/4, Sec. 36, T.29S., R.22E., Crawford Co., Kansas.
- CR-382 = Limestone float, probably Laberdie, in fields on both sides of road; along West line SE1/4, NE1/4, SE1/4, Sec. 36, T.29S., R.22E., Crawford Co., Kansas.
- CR-383 = Limestone (Laberdie) in place on North side of road at @ 959'; approx. 450 feet East of Center of South line, Sec. 36, T.29S., R.22E., Crawford Co., Kansas.
- CR-384 = Anna shale/Myrick Station (Pawnee) limestone contact at 940' in pond bank East of road; approx. 350 feet East and 100 feet South of Center of West line, SW1/4, SW1/4, Sec. 36, T.29S., R.22E., Crawford Co., Kansas.
- CR-385 = Limestone (Laberdie) in place at 950' in road ditch on West side of road; approx. 100 feet North of Center of East line, SE1/4, SE1/4, Sec. 35, T.29S., R.22E., Crawford Co., Kansas.
- CR-386 = Anna shale/Myrick Station (Pawnee) limestone contact at @ 930' in drainage in field on North side of road; approx. 350 feet East and 150 feet North of Center of South line, Sec. 35, T.29S., R.22E., Crawford Co., Kansas; area of C-36.

- CR-387 = Limestone (Laberdie) in place along drainage on South side of road;  
Just South of Center of North line, NE1/4, NW1/4, Sec. 2, T.30 S., R.22E., Crawford Co., Kansas.
- CR-388 = Limestone (Laberdie) in place along road and in field West of road;  
Just North and West of SE cor., Sec. 4, T.30S., R.22E., Crawford Co., Kansas.
- CR-389 = Limestone (Laberdie) in place in field West of road; approx. 1000 feet  
North of SE cor. Sec. 9, T.30S., R.22E., Crawford Co., Kansas.
- CR-390 = Anna shale/Myrick Station (Pawnee) limestone contact at @ 940' in  
road ditch on both sides of road; approx. 500 feet East of Center of South line, Sec. 10, T.30S.,  
R.22E., Crawford Co., Kansas.
- CR-391 = Limestone (Laberdie) in place in road; near SW cor., Sec. 11, T.30S.,  
R.22E., Crawford Co., Kansas.
- CR-392 = Thin bedded sandstone in Labette Shale in creek on South side of road;  
Just South and West of NE cor., Sec. 14, T.30S., R.22E., Crawford Co., Kansas.
- CR-393 = Anna shale/Myrick Station (Pawnee) limestone contact at @ 950' in  
road; just North of Center of East line SE1/4, Sec. 14, T.30S., R.22E., Crawford Co., Kansas.
- CR-394 = Top Anna shale/base Pawnee (Myrick Station) Limestone at @ 950' in  
road and field South of road; approx. 400 feet West of Center of South line, SE1/4, Sec. 15,  
T.30S., R.22E., Crawford Co., Kansas.
- CR-395 = Limestone float (Myrick Station) in field North of road at 950' and  
above; near Center of South line, SW1/4, SE1/4, SW1/4, Sec. 15, T.30S., R.22E., Crawford Co.,  
Kansas.
- CR-396 = Limestone (Higginsville?) float in pond bank East of road at @915'; just  
East of Center of West line, NW1/4, SW1/4, Sec. 22, T.30S., R.22E., Crawford Co., Kansas.
- CR-397 = Limestone slabs above large pieces of black platy shale in creek bank  
West of road; contact at 880', nothing in place observed, possibly Higginsville and Little Osage;  
approx. 200 feet South and 100 feet West of NE cor., Sec. 34, T.30S., R.22E., Crawford Co.,  
Kansas.
- CR-397A = Limestone in road at 890'; approx. 150 feet South of Center of East  
line, NE1/4, Sec. 34, T.30S., R.22E., Crawford Co., Kansas.
- CR-398 = Limestone (Higginsville) with black, platy shale (Little Osage) exposed  
below in creek North of road, contact at @ 880', approx. 6 feet of Limestone (Higginsville)  
exposed in old quarry South of road; creek exposure is near Center of North line NW1/4, NW1/4,  
Sec. 35, T.30S., R.22E., Crawford Co., Kansas; old quarry is approx. 200 feet South and 150 feet  
East of creek bank exposure.
- CR-399 = Limestone in place along both sides of road from CR-398 to this site at  
890'; Center North line, Sec. 35, T.30S., R.22E., Crawford Co., Kansas.
- CR-400 = Limestone float in drainage West of road, near the top of limestone  
unit?? at an elevation of @903'; just South of Center of West line SW1/4, NW1/4, NW1/4, Sec.  
36, T.30S., R.22E., Crawford Co., Kansas.
- CR-401 = Mudstone and siltstone (Labette) float in drainage East of road; near

- Center of West line, NW1/4, Sec. 2, T.31S., R.22E., Crawford Co., Kansas.
- CR-402 = Thin bedded limestone (Higginsville) in place in stream in field North of Kansas Highway 126; tabular chaetetids in slabs South of road in drainage (REVISIT); just North of Center of SW1/4, SW1/4, SE1/4, Sec. 23, T.30S., R.22E., Crawford Co., Kansas.
- CR-403 = Limestone (Higginsville ?) float in drainage on both sides of road and outcrop on East side of road in wooded area just below an elevation of 900'; approx. 200 feet South of Center of N1/2, NE1/4, Sec. 25, T.30S., R.22E., Crawford Co., Kansas.
- CR-404 = Limestone in place on both sides of road; near Center of East 1/2, Sec. 25, T.30S., R.22E., Crawford Co., Kansas.
- CR-405 = Sandy, silty mudrock (Lagonda) at Osage Cemetery; Center NE1/4, SE1/4, Sec. 25, T.30s., R.22E., Crawford Co., Kansas.
- CR-406 = Base of Fort Scott (Blackjack Creek) Limestone at 905' with Excello shale, Breezy Hill limestone, and silty, sandy mudrock of Lagonda below in roadcut East of road and in field West of road, near C-52; along South half of East line and South line, SW1/4, NE1/4, SE1/4, Sec. 36, T.30S., R.22E., Crawford Co., Kansas.
- CR-407 = Base of Fort Scott (Blackjack Creek) Limestone at approx. 920'; approx. 350 feet East of Center of North line, NE1/4, Sec. 36, T.30S., R.22E., Crawford Co., Kansas.
- CR-408 = Base of thick, massive limestone (Higginsville) at 890' in roadcut on North side of Kansas Highway 126, chaetetids as at L-700, Little Osage shale thin?, Blackjack Creek limestone covered, thin?; near Center of South line, SE1/4, SE1/4, Sec. 24, T.30S., R.22E., Crawford Co., Kansas.
- CR-409 = Base of Fort Scott (Blackjack Creek) Limestone at 900' with Excello shale and Lagonda below in road ditch; near Center East line NE1/4, NE1/4, SE1/4, Sec. 24, T30S., R.22E., Crawford Co., Kansas.
- CR-410 = Mudrock (Labette?) at 927' in road; near Center of East line SE1/4, NE1/4, Sec. 24, T.30S., R.22E., Crawford Co., Kansas.
- CR-411 = Base of Fort Scott (Blackjack Creek) Limestone at 902' in road with Excello shale and Lagonda exposed in drainage East of road; near Center of East line NE1/4, NE1/4, sec. 24, tT.30S., r.22E., Crawford Co., Kansas.
- CR-412 = Base of Fort Scott (Blackjack Creek) Limestone at 886', sequence measured by Sawin extends from Lagonda into Higginsville with 1.5' of Breezy Hill limestone, 4.0' of Excello shale, and 12+' of Fort Scott Limestone with the top near an elevation of 898'; I estimate the Little Osage and Blackjack Creek to be 1 to 1.5 feet thick; chaetetids in Higginsville as at L-700; approx. 500 feet South of Center of West line Sec. 18, T.30S., R.23E., Crawford Co., Kansas.
- CR-413 = Limestone exposed in field East of road at 898'; near Center of West line NW1/4, NW1/4, SW1/4, Sec. 18, T.30S., R23E., Crawford Co., Kansas.
- CR-414 = Limestone (Higginsville, with chaetetids as at L-700) forms bed of stream at an elevation of 880' and lower near Center of NE1/4, NW1/4, NW1/4, Sec. 18, T.30S., R.23E., Crawford Co., Kansas.
- CR-415 = Top of Fort Scott (Higginsville) Limestone at 900' in abandoned

- quarry, same as localities C-53, C-54, and L-700; quarry covers most of the S1/2, SE1/4, Sec.12, T.30S., R.22E., Crawford Co., Kansas.
- CR-416 = Limestone (Higginsville) in West bank of Lightning Creek on East side of road between an elevation of 880 and 885 feet, chaetetids as at L-700, collected float specimen; near Center SE1/4, SE1/4, NE1/4, Sec. 6, T.30S., R.23E., Crawford Co., Kansas.
- CR-417 = Limestone (Higginsville) outcrop in drainage on West side of road at approx. 890', exposure is continuous from CR-416 to this site along the bank of Lightning Creek; approx. 100 feet South and 200 feet East of NW cor., NE1/4, NE1/4, SE1/4, Sec. 6, T.30S., R.23E., Crawford Co., Kansas.
- CR-418 = Limestone (Higginsville) outcrop in drainage on West side of road at approx. 890'; near Center East line, SW1/4, NE1/4, SE1/4, Sec. 6, T.30S., R.23E., Crawford Co., Kansas.
- CR-419 = Limestone (possibly Blackjack Creek and Higginsville) with base? of Fort Scott (Blackjack Creek) Limestone at 900'? in road and in field North of road; near SE cor., Sec. 6, T.30S., R.23E., Crawford Co., Kansas.
- CR-420 = Limestone (Higginsville) in road from near CR-419 to the top of the hill to the West at an elevation of 920±'; from just West of CR-419 westward along South line SE1/4, SE1/4 to just West of Center of South line of SE1/4, Sec. 6, T.30S., R.23E., Crawford Co., Kansas.
- CR-421 = Silty, sandy mudrock and thin bedded, platy sandstone in drainage South of road, also exposed in West bank of Lightning Creek North of road; along South and southern half of East line SW1/4, SW1/4, NW1/4, sec. 8, T.30S., R.23E., Crawford Co., Kansas.
- CR-422 = Base of Fort Scott (Blackjack Creek) Limestone in road cuts on both sides of road at 910'; near Center Sec. 8, T.30S., R.23E., Crawford Co., Kansas.
- CR-423 = Limestone (Higginsville) with chaetetids as seen at L-700, exposed in drainage on both sides of road at 913'; approx. 150 feet West and 100 feet South of Center of East line, Sec. 5 and approx. 150 feet South and 100 feet East of Center of West line Sec. 4, T.30S., R.23E., Crawford Co., Kansas.
- CR-424 = Limestone (Higginsville ?) float in drainage on both sides of road; approx. 100 feet North of Center East line SE1/4, SE1/4, Sec. 31, T.29S., R.23E., Crawford Co., Kansas.
- CR-425 = Sandy, silty mudrock (Labette) in road at 932±'; approx. 200 feet North of SE cor., Sec. 32, T.29S., R.23E., Crawford Co., Kansas.
- CR-426 = Limestone (Higginsville) in road ditch East of road, close to top of Fort Scott limestone at 915'; approx. 500 feet North of Center of East line Sec. 32, T.29S., R.23E., Crawford Co., Kansas.
- CR-427 = Limestone (Higginsville ?) in road and fields on both sides of road at 910'; near Center of North line NW1/4, NE1/4, Sec. 32, T.29S., R.23E., Crawford Co., Kansas.
- CR-428 = Limestone (Higginsville) in bed of Lightning Creek with chaetetids like those at L-700; near Center of North line of NE1/4, NE1/4, NE1/4, Sec. 29, T.29S., R.23E., Crawford Co., Kansas.
- CR-429 = Base of Pawnee (Myrick Station) Limestone at 960' in road with

- Anna shale below; approx. 150 feet North of Center of West line of NW1/4, Sec. 27, T.29S., R.23E., Crawford Co., Kansas.
- CR-430 = Possible base of Pawnee (Myrick Station) Limestone at 962' in road, NOT WELL EXPOSED; approx. 200 feet East of Center of North line of NW1/4, Sec. 27, T.29S., R.23E., Crawford Co., Kansas.
- CR-431 = Limestone (Laberdie) in road at 970'; approx. 300 feet West of Center of North line Sec. 27, T.29S., R.23E., Crawford Co., Kansas.
- CR-432 = Limestone (Laberdie) in road at an elevation greater than 980'; approx. 1000 feet East of Center of North line Sec. 27, T.29S., R.23E., Crawford Co., Kansas.
- CR-433 = Possible base of Pawnee (Myrick Station) Limestone at 980' in road, NOT WELL EXPOSED; approx. 200 feet East of Center of South line Sec. 27, T.29S., R.23E., Crawford Co., Kansas.
- CR-433A = Same as CR-343 on West side of hill; approx. 300 feet West of Center of South line Sec. 27, T.29S., R.23E., Crawford Co., Kansas.
- CR-434 = Sandstone (Labette) in stream on East side of road; approx. 200 feet East and 200 feet South of Center of West line of SW1/4, Sec. 27, T.29S., R.23E., Crawford Co., Kansas.
- CR-435 = Base of Pawnee (Myrick Station) Limestone at 971' in road ditch on East side of road; approx. 350 feet North of Center of West line Sec. 34, T.29S., R.23E., Crawford Co., Kansas.
- CR-436 = Sandstone (Labette) in road at 948'; near Center of West line NW1/4, SW1/4, Sec. 3, T.30S., R.23E., Crawford Co., Kansas.
- CR-437 = Base of Fort Scott (Blackjack Creek) Limestone with Excello shale below forming the bed of Thunderbolt Creek at 900', exposed in eroded creek bank West of road on North side of road; near center of South line of SE1/4, NW1/4, Sec. 10, T.30S., R.23E., Crawford Co., Kansas.
- CR-348 = Limestone in drainage on East side of road; near center of East line, SW1/4, NW1/4, SW1/4, Sec. 11, T.30S., R.23E., Crawford Co., Kansas; RADLEY QUAD.
- CR-439 = Limestone (Higginsville) in place in road at 910'; approx. 700 feet South of Center Sec. 10, T.30S., R.23E., Crawford Co., Kansas.
- CR-440 = Limestone (Higginsville) in place at 890' in North bank of creek West of the road, tabular chaetetids in limestone (collected small in situ specimen and one domical float specimen from stream bed), just South of Meyers Cemetery; near Center of East line of SE1/4, NE1/4, SE1/4, Sec. 9, T.30S., R.23E., Crawford Co., Kansas.
- CR-441 = Limestone (Higginsville) in place in road at 905'; approx. 200 feet South of Center of East line of SE1/4, Sec. 9, T.30S., R.23E., Crawford Co., Kansas.
- CR-442 = Limestone (Higginsville) in road and drainage on both sides of road; near Center of East line of NE1/4, NE1/4, NE1/4, Sec. 16, T.30S., R.23E., Crawford Co., Kansas.
- CR-443 = Base of Fort Scott (Blackjack Creek) Limestone with Excello shale below at 900' in road ditch on West side of road; approx. 350 feet South of Center of East line of Sec. 17, T.30S., R.23E., Crawford Co., Kansas.

- CR-444 = Blackjack Creek limestone in place in North bank of creek West of road with Higginsville limestone in place in northeast bank of creek on East side of road, float blocks of Higginsville limestone are like those at L-700 with chaetetids; near Center of East line of NE1/4, SE1/4, NE1/4, Sec. 20 and near Center of West line of NW1/4, SW1/4, NW1/4, Sec. 21, T.30S., R.23E., Crawford Co., Kansas.
- CR-445 = Base of Fort Scott (Blackjack Creek) Limestone in road ditch on both sides of road at 900'??, CONTACT NOT SEEN; near Center of North line of NE1/4, Sec. 20, T.30S., R.23E., Crawford C., Kansas.
- CR-446 = Base of Fort Scott (Blackjack Creek) Limestone in road at 910'??, CONTACT NOT SEEN; approx. 400 feet West of Center of South line Sec. 2, T.30S., R.23E., Crawford Co., Kansas.
- CR-447 = Sandy, silty mudrock (Lagonda) in road ditch on South side of road at 928'; approx. 500 feet West of SE cor., Sec. 32, T.30S., R.23E., Crawford Co., Kansas.
- CR-448 = Sandy, silty mudrock (Lagonda) in road ditch on North side of road; approx. 100 feet West of Center of South line of SE1/4, Sec. 33, T.30S., R.23E., Crawford Co., Kansas.
- CR-449 = Blackjack Creek limestone in road at about 900' and above, close to the base of the Fort Scott Limestone at 900'; near Center of East line of SE1/4, Sec. 33, T.30S., R.23E., Crawford Co., Kansas.
- CR-450 = Limestone (Higginsville?) in South bank of creek on West side of road below 900', chaetetids in float; near Center of East line of NE1/4, NE1/4, Sec. 33, T.30S., R.23E., Crawford Co., Kansas.
- CR-451 = Base of Fort Scott (Blackjack Creek) Limestone at 895'??? on West side of road; near Center of East line of SE1/4, SE1/4, Sec. 28, T.30S., R.23E., Crawford Co., Kansas.
- CR-452 = Sandy, silty mudrock and sandstone (Lagonda) in creek bank on South side of Kansas Highway 126; approx. 200 feet East of Center of North line Sec. 27, T.30S., R.23E., Crawford Co., Kansas.
- CR-453 = Large, hard, dense, dark gray to black limestone septarian concretions in a light chocolate brown, silty mudrock in place in creek on West side of road, possibly Excello shale, compare with C-55; near center of west line, SE1/4, SE1/4, NE1/4, Sec. 27, T.30S., R.23E., Crawford Co., Kansas; RADLEY QUAD.
- CR-454 = Reddish sandstone in road; near Center of west line, NE1/4, NE1/4, SE1/4, Sec. 27, T.30S., R.23E., Crawford Co., Kansas; RADLEY QUAD.

## McCUNE QUADRANGLE

EXPLANATION - CONTROL POINTS FOR THE CRAWFORD COUNTY MAP ARE IDENTIFIED AS FOLLOWS:

(1) NUMBERS PRECEDED BY THE LETTER **C** REFER TO MEASURED SECTIONS IN THE CRAWFORD COUNTY, KANSAS BOOKS IN THE FILES OF THE KANSAS GEOLOGICAL SURVEY, NUMBERING BEGAN AT FIRST SECTION IN THE BOOK AND PRECEDED SEQUENTIALLY TO THE LAST SECTION;

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(3) NUMBERS PRECEDED BY THE LETTERS **CR** ARE SITES EXAMINED AND EVALUATED SPECIFICALLY FOR THIS MAPPING PROJECT.

(4) NUMBERS PRECEDED BY THE LETTERS **CH** ARE SITES IN CHEROKEE COUNTY EXAMINED SPECIFICALLY FOR THIS MAPPING PROJECT AND ARE ALSO GIVEN **CR** NUMBERS..

OBVIOUSLY, ANY GIVEN SITE MAY BE IDENTIFIED BY ANY ONE, TWO, OR ALL THREE OF THESE DESIGNATIONS.

CR-351 = Base of Fort Scott (Blackjack Creek) Limestone/top of Excello shale at 877' in road and in field West of road; near Center of West line, SW1/4, NW1/4, SW1/4, Sec. 18, T.31S., R.22E., Crawford Co., Kansas.

CR-352 = Limestone in road and fields on both sides of road at 910'; near Center of West line, SW1/4, SW1/4, Sec. 17, T.31S., R.22E., Crawford Co., Kansas.

CR-353 = Limestone in road at 914', looks in place; approximately 150 feet South of Center of West line, NW1/4, SW1/4, Sec. 17, T.31S., R.22E., Crawford Co., Kansas.

CR-354 = Base of Fort Scott (Blackjack Creek) Limestone at 900' in road and on both sides of road; along Center of West line, NW1/4, SW1/4, NW1/4, Sec. 17, T.30S., R.22E., Crawford Co., Kansas.

CR-355 = Base of Fort Scott (Blackjack Creek) Limestone/top of Excello shale at 912' as revealed by water seepage and black soil in field North of road, VERY POOR exposure; **silicified chaetetids as float**; near Center of North line NW1/4, NW1/4, NE1/4, Sec. 9, T.30S., R.22E., Crawford Co., Kansas.

CR-356 = Limestone (float) in field South of road at 904'; approximately 200 feet East of Center of South line, SW1/4, Sec. 9, T.30S., R.22E., Crawford Co., Kansas.

CR-357 = CH-1 = Base of Fort Scott (Blackjack Creek) Limestone/top of Excello shale at 895' in road, Myrick Station limestone well exposed above contact and sandstone (Lagonda) equally well exposed below contact in road and road ditches on both sides of hill; **tabular to low domical chaetetids in float blocks** used to construct fence; near Center of South line, SW1/4, Sec. 20, T.31S., R.22E., Cherokee Co., Kansas.

CR-358 = CH-2 = Base of Fort Scott (Blackjack Creek) Limestone/top of Excello shale at 905', similar sequence exposed along both sides of road; **tabular to low domical chaetetids in float blocks** used to construct fence; approximately 300 feet South of Center of West line, NW1/4, SW1/4, Sec. 20, T.31S., R.22E., Cherokee Co., Kansas.

CR-359 = CH-3 = Base of Fort Scott (Blackjack Creek) Limestone/top of Excello shale at 900', similar sequence exposed along both sides of road, but less well exposed; near Center of South line, SW1/4, SW1/4, SW1/4, Sec. 19, T.31S., R.22E., Cherokee Co., Kansas.

CR-360 = Limestone at 885' in culvert under U.S. Hwy 400, limestone well exposed in creek bed on the North side of highway; **two specimens of low domical to tabular chaetetids collected from top**

**of exposed limestone, very similar to those seen as float at the two Cherokee sites [CR-357 (CH-1) and CR-358 (CH-2)]; near Center of South line, SE1/4, SW1/4, Sec. 18, T.31S., R.22E., Crawford Co., Kansas; chaetetids collected from stream bed just North and West of this point.**

## McCUNE NE QUADRANGLE

EXPLANATION - CONTROL POINTS FOR THE CRAWFORD COUNTY MAP ARE IDENTIFIED AS FOLLOWS:

(1) NUMBERS PRECEDED BY THE LETTER C REFER TO MEASURED SECTIONS IN THE CRAWFORD COUNTY, KANSAS BOOKS IN THE FILES OF THE KANSAS GEOLOGICAL SURVEY, NUMBERING BEGAN AT FIRST SECTION IN THE BOOK AND PRECEDED SEQUENTIALLY TO THE LAST SECTION;

(2) NUMBERS PRECEDED BY THE LETTER L REFER TO SITES FROM WHICH I HAVE COLLECTED GEOLOGICAL SPECIMENS; AND

(3) NUMBERS PRECEDED BY THE LETTERS CR ARE SITES EXAMINED AND EVALUATED SPECIFICALLY FOR THIS MAPPING PROJECT.

OBVIOUSLY, ANY GIVEN SITE MAY BE IDENTIFIED BY ANY ONE, TWO, OR ALL THREE OF THESE DESIGNATIONS.

C-34 = Limestone identified as Tina (Amoret) with mudrocks below, measured and described by J. M. Jewett; along the Neosho-Crawford County line near the Center of East line of NE1/4, NE1/4, Sec. 27, T.29S., R.21E., Neosho Co., Kansas; same as CR-295.

C-51 = Exposure on North side of creek East of road near Center of North line, Sec. 23, T.30S., R.21E., Crawford Co., Kansas; Pawnee Limestone (Anna to Laberdie) according to Jewett, 1941; EXCELLENT exposure and accurate, see CR-341.

CR-293 = Thick sandstone in drainage at low water bridge; near Center of South line of SW1/4, SW1/4, SE1/4, Sec. 21, T.29S., R.22E., Crawford Co., Kansas.

CR-294 = Sandstone in road; Center of South line, SW1/4, SE1/4, Sec. 20 T. 29S., R.22E., Crawford Co., Kansas.

CR-295 = Base of limestone (Altamont?) in road at @ 890', near top of hill 1.15 miles South of U.S. Highway 57 on road between Sections 26 and 27, T. 29S., R.21E., Crawford/Neosho Co., Kansas, with sandstone in creek West of road; McCune Northeast Quad.

CR-296 = Limestone float in field West of road at top of hill; near Center of West line, NW1/4, SW1/4, Sec. 26, T.29S., R.21E., Crawford Co., Kansas.

CR-297 = Altamont Limestone at 943' in road; near Center of South line, SW1/4, SE1/4, Sec. 26, T.29S., R.21E., Crawford Co., Kansas.

CR-298 = Altamont Limestone at 942' in road; near Center of South line, SE1/4, SW1/4, SW1/4, Sec. 25, T.29S., R.21E., Crawford Co., Kansas.

CR-299 = Fields with Bandera type terrane along both sides of the road for a half mile both North and South of this point; Center of East line, Sec. 25, T.29S., R.21E., Crawford Co., Kansas.

CR-300 = Limestone float in field North of road, probably near the base of the Altamont Limestone at 950'; Center of North line, Sec. 25., T.29S., R.21E., Crawford Co., Kansas.

CR-301 = Near base of Altamont Limestone at 943' in road; near Center of East line, SW1/4, NE1/4, NE1/4, Sec. 26, T.29S., R.21E., Crawford Co., Kansas.

CR-302 = Very similar to CR-301, but less well exposed; Center of East line, Sec. 26, T.29S., R.21E., Crawford Co., Kansas.

CR-303 = Bandera Shale, thin bedded, platy sandstone with mudrock in drainage on both sides of road; near Center of South line, SW1/4, SW1/4, SW1/4, Sec. 36, T.29S., R.21E., Crawford Co., Kansas.

- CR-304 = Bandera Shale exposed in bank of Hickory Creek on the South side of road; slightly East and South of the Center of the North line of Sec. 1, T.30 S., R.22E., Crawford Co., Kansas.
- CR-305 = Sandstone float dumped in as part of bridge work in drainage West of road; near Center of East line, SE1/4, SE1/4, Sec. 1, T.30S., R.22E., Crawford Co., Kansas.
- CR-305A = Orange colored, sandy soil suggesting sandstone; near Center of South line, SE1/4,SW1/4, SW1/4, Sec. 6, T.30S., R.22E., Crawford Co., Kansas.
- CR-306 = Fields with Bandera type terrene along both sides of the road for a half mile both North and South of this point; Center of West line, Sec. 1, T.30S., R.21E., Crawford Co., Kansas.
- CR-307 = Poor exposure, but possibly near top of Altamont Limestone at 935' in road with the possibility of the lower Altamont (Amoret) Limestone near the SW cor. of Sec. 35; near Center of South line, SW1/4, SW1/4, Sec. 35, T.29S., R.21E., Crawford Co., Kansas.
- CR-308 = Limestone float (Altamont?) on both sides of the road for about an eighth of a mile; along East line, NE1/4, NE1/4, NE1/4, Sec. 3, T.30S., R.21E., Crawford Co., Kansas.
- CR-309 = Limestone float in road at 873'; near Center of South line, SW1/4, SE1/4, SE1/4, Sec. 11, T.30S., R.21E., Crawford Co., Kansas.
- CR-310 = Probable top of Pawnee (Laberdie) Limestone at 898' in field North of road; near Center of South line, Sec. 7, T.30S., R.22E., Crawford Co., Kansas.
- CR-311 = Limestone (Pawnee) float in road North of old quarry and in fields around old quarry; near Center of South line, SW1/4, SE1/4, SE1/4, Sec. 7, T.30S., R.22E., Crawford Co., Kansas.
- CR-312 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 885' in creek bank South of road and East of old quarry; approximately three feet of Laberdie limestone and about a foot of Myrick Station limestone exposed near old quarry; about 300' South of the Center of North line, NE1/4, NE1/4, Sec. 18, T.30 S., R.22E., Crawford Co., Kansas.
- CR-313 = Excellent base of Pawnee (Myrick Station) Limestone/ top of Anna shale at 860' in bank of Hickory Creek North of road; near center of SW1/4, SE1/4, SW1/4, Sec. 12, T.30S., R.21E., Crawford Co., Kansas.
- CR-314 = Thin bedded sandstone exposed in drainage West of road, Bandera Shale; approximately 150' North and 100' West of the Center of East line, Sec. 29, T.29S., R.22E., Crawford Co., Kansas.
- CR-315 = Pawnee (Laberdie) Limestone at @ 900'; in field approximately 1000 feet due West of Center of East line, Sec. 8, T.30S., R.22E., Crawford Co., Kansas.
- CR-316 = Pawnee (Laberdie) Limestone in road at 910'; approximately 300 feet due South of Center of East line, Sec. 8, T.30S., R.22E., Crawford Co., Kansas.
- CR-316A = Pawnee (Laberdie) Limestone in road at 915'; near Center of East line, SE1/4, Sec. 8, T.30S., R.22E., Crawford Co., Kansas.
- CR-317 = Limestone, Pawnee?, in road at 910'; near Center of East line, SE1/4, SE1/4, Sec. 8, T.30S., R.22E., Crawford Co., Kansas.
- CR-318 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 910' in creek bank North of road, good point; approximately 300 feet West and 100 feet North of Center of South line, SW1/4, Sec. 9, T.30S., R.22E., Crawford Co., Kansas.

- CR-319 = Blocks of Myrick Station limestone in pond bank, pond probably built on Anna shale; approximately 300 feet North and 50 feet West of SE cor., Sec. 8, T.30S., R.22E., Crawford Co., Kansas.
- CR-320 = Pawnee (Laberdie) Limestone in road at 922'; approximately 400 feet due West of SE cor., Sec. 8, T.30S., R.22E., Crawford Co., Kansas.
- CR-321 = Pawnee (Laberdie) Limestone in barnyard North of road at 895 to 900 feet; near Center of South line, SW1/4, SW1/4, Sec. 8, T.30S., R.22E., Crawford Co., Kansas.
- CR-322 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 885' in creek on both sides of road; near Center of West line, SW1/4, NW1/4, NW1/4, Sec. 7, T.30S., R.22E., Crawford Co., Kansas.
- CR-323 = Myrick Station limestone in place under bridge and in creek on West side of road at 890', no contact; just West of Center of East line, NE1/4, NE1/4, SE1/4, Sec. 18, T.30S., R.22E., Crawford Co., Kansas.
- CR-324 = Large blocks of Myrick Station? limestone in road ditch on South side of road; near Center of North line, NE1/4, NE1/4, Sec. 19, T.30S., R.22E., Crawford Co., Kansas.
- CR-325 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 900' based on water seepage along South side of road, POOR point; near Center of North line, NE1/4, Sec. 19, T.30S., R.22E., Crawford Co., Kansas.
- CR-326 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 900' in road, EXCELLENT point; approximately 150 feet West of Center of North line, Sec. 19, T.30S., R.22E., Crawford Co., Kansas.
- CR-327 = Labette Shale exposed in creek bank at @ 870' in old oil field North of road, coaly layer with underclay like lithology below and a thin, platy bedded, clayey, fossiliferous limestone above, possibly the Lexington Coal Bed; approximately 800 feet North and 100 feet West of Center of South line, Sec. 18, T.30S., R.22E., Crawford Co., Kansas.
- CR-328 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 892' in road, like at CR-326 but not as clearly exposed, but reliable; near Center of South line, SE1/4, SW1/4, Sec. 18, T.30S., R.22E., Crawford Co., Kansas.
- CR-329 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 892' in drainage South of road, like at CR-326 but not as clearly exposed, but reliable (same as CR-328); Myrick Station limestone well exposed along the road with what looks like Laberdie limestone above, Mine Creek shale appears to be absent here; approximately 100 feet due South and 150 feet East of Center of North line, NW1/4, Sec. 19, T.30S., R.22E., Crawford Co., Kansas.
- CR-330 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 870' in road ditch on East side of road, weathered exposure, but reliable; approximately 200 feet South of Center of West line, NW1/4, SW1/4, Sec. 18, T.30S., R.22E., Crawford Co., Kansas.
- CR-331 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 950' in road, GOOD point; near Center of west line, NW1/4, SW1/4, SW1/4, Sec. 21, T.30S., R.22E., Crawford Co., Kansas.
- CR-332 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 915' in bank of nearly dried up pond, exposure would be underwater if pond were full, viewed from road; near Center SE1/4, Sec. 17, T.30S., R.22E., Crawford Co., Kansas.

- CR-333 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 910' in field West of road, well exposed in pond bank, viewed from road; approximately 200 feet West and 300 feet South of Center of East 1/2, Sec. 19, T.30S., R.22E., Crawford Co., Kansas.
- CR-333A = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 912' in road, POORLY exposed; approximately 250 feet South of Center of East line, Sec. 19, T.30S., R.22E., Crawford Co., Kansas.
- CR-334 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 950' on both sides of road, GOOD point; approximately 100 feet North of Center of East line, NE1/4, Sec. 30, T.30S., R.22E., Crawford Co., Kansas.
- CR-335 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 942' in road ditch on South side of road, GOOD point; approximately 150 feet West of NE cor., Sec. 30, T.30S., R.22E., Crawford Co., Kansas.
- CR-336 = Limestone, Myrick Station, in place in road at 935', close to the base of the Myrick Station limestone and top of Anna shale; approximately 300 feet West of Center of North line, NW1/4, NE1/4, Sec. 30, T.30S., R.22E., Crawford Co., Kansas.
- CR-337 = Limestone, Myrick Station, in place in road at 935', close to the base of the Myrick Station limestone and top of Anna shale, contact no exposed; approximately 250 feet West of Center of North line, Sec. 30, T.30S., R.22E., Crawford Co., Kansas.
- CR-338 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 930' in road and in field West of road, POORLY exposed, Anna shale not seen but seep at presumed contact; approximately 400 feet South and 200 feet West of NE cor, Sec. 25, T.30S., R.21E., Crawford Co., Kansas.
- CR-339 = Limestone (Pawnee) in road at 902'; near Center of North line, NW1/4, NE1/4, NE1/4, Sec. 24, T.30S., R.21E., Crawford Co., Kansas.
- CR-340 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 860' in ditch on North side of road; approximately 150 feet East of SW cor., Sec. 13, T.30S., R.21E., Crawford Co., Kansas.
- CR-341 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 850' in West bank of Hickory Creek East and North of road, EXCELLENT exposure of Pawnee Limestone, see Jewett's 1941 Sec. (C-51), limestone also in road to the West; approximately 100 feet North of Center of South line, Sec. 14, T.30S., R.21E., Crawford Co., Kansas.
- CR-342 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 870' in hillside along old road; approximately 200 feet West of Center of North line, NE1/4, NW1/4, Sec. 26, T.30S., R.21E., Crawford Co., Kansas.
- CR-343 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 885' in road; approximately 100 feet East of Center of North line, NW1/4, NW1/4, Sec. 25, T.30S., R.21E., Crawford Co., Kansas.
- CR-344 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 910' in road; approximately 420 feet South of Center of West line, Sec. 25, T.30S., R.21E., Crawford Co., Kansas.
- CR-345 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 910' in road; approximately 200 feet North of Center of West line, SW1/4, Sec. 25, T.30S., R.21E., Crawford Co., Kansas.
- CR-346 = Limestone (Myrick Station) in road and fields on both sides of road at the top of hill above 910'; approximate Center of SE 1/4, Sec. 26, T.30S., R.21E., and over hill to the South, Crawford Co., Kansas.

CR-347 = Sandy terrane along both sides of the road for a half mile both East and West of this point; Center of North line, Sec. 31, T.30S., R.22E., Crawford Co., Kansas.

CR-348 = Sandstone well exposed in road at 900', probably Englevale; near Center of East line, NE1/4, SE1/4, NE1/4, Sec. 31, T.30S., R.22E., Crawford Co., Kansas.

CR-349 = Thin to platy bedded, yellowish brown sandstone exposed on both sides of the road at the top of the hill, probably Englevale; near Center of East line, SE1/4, SE1/4, NE1/4, Sec. 31, T.30S., R.22E., Crawford Co., Kansas.

CR-350 = Limestone slabs and mudrock in pond bank at farm on West side of road; approximately 150 feet South and 50 West of Center of East line, Sec. 35, T.30S., R.21E., Crawford Co., Kansas.

## WEST MINERAL QUADRANGLE

EXPLANATION - CONTROL POINTS FOR THE CRAWFORD COUNTY MAP ARE IDENTIFIED AS FOLLOWS:

(1) NUMBERS PRECEDED BY THE LETTER C REFER TO MEASURED SECTIONS IN THE CRAWFORD COUNTY, KANSAS BOOKS IN THE FILES OF THE KANSAS GEOLOGICAL SURVEY, NUMBERING BEGAN AT FIRST SECTION IN THE BOOK AND PRECEDED SEQUENTIALLY TO THE LAST SECTION;

(2) NUMBERS PRECEDED BY THE LETTER L REFER TO SITES FROM WHICH I HAVE COLLECTED GEOLOGICAL SPECIMENS; AND

(3) NUMBERS PRECEDED BY THE LETTERS CR ARE SITES EXAMINED AND EVALUATED SPECIFICALLY FOR THIS MAPPING PROJECT.

OBVIOUSLY, ANY GIVEN SITE MAY BE IDENTIFIED BY ANY ONE, TWO, OR ALL THREE OF THESE DESIGNATIONS.

C-71 = SW1/4, SW1/4, Sec. 16, T.31S., R.23E., Crawford Co., Kansas, road cut on highway west of Cherokee, Kansas; Breezy Hill to Blackjack Creek Limestone according to Howe, 1949.

C-72 = North 1/2, SE1/4, Sec. 7, T.31S., R.23E., Crawford Co., Kansas, Apex Coal Company pit near Monmouth, Kansas; Bevier Coal and interval above according to Howe, 1948.

CR-361 = Limestone (Blackjack Creek) in road at 920' capping hill; near Center of West line NW1/4, Sec. 17, T.31S., R.23E., Crawford Co., Kansas.

CR-362 = Base of Fort Scott (Blackjack Creek) Limestone/top of Excello shale at 930' on both sides of U.S. Hwy 400; approximately 200 feet East of Center of South line, SW1/4, SE1/4, Sec. 17, T.31S., R.23E., Crawford Co., Kansas.

CR-363 = Base of Fort Scott (Blackjack Creek) Limestone/top of Excello shale at approximately 935' on both sides of U.S. Hwy 400; area of C-71; near Center of South line, SE1/4, SW1/4, Sec. 16, T.31S., R.23E., Crawford Co., Kansas.

CR-364 = Top of Verdigris limestone at about 880' in old road just North of Wolf Creek; near Center of East line, SE1/4, SE1/4, SE1/4, Sec. 16, T. 31S., R.23E., Crawford Co., Kansas.

CR-365 = Hard, black, dense, nodular limestone about 10 cm thick exposed in bed of stream with dark gray to black mudrock about overlain by yellowish brown mudrock with thin ferruginous limestone lenses/layers, elevation of stream bed is about 860'; approximately 100 feet West and 200 feet South of NE cor., Sec. 17, T.31S., R.23E., Crawford Co., Kansas.

CR-366 = Limestone (Blackjack Creek) in place? In road at 925', limestone continues to the top of the hill to the East, old stone farm buildings appear to have been constructed, without mortar, from slabs of this limestone, in the buildings the slabs look much like slabs of Higginsville; approximately 300 feet West of Center of South line, Sec. 10, T.31S., R.23E., Crawford Co., Kansas.

CR-367 = Limestone, in place? in road; Cherokee Quad.; near Center of East line, NE1/4, SE1/4, NE1/4, Sec. 10, T.31S., R.23E., Crawford Co., Kansas.

CR-368 = Hard, dense, fossiliferous, dark gray fresh, weathers yellowish brown limestone less than one foot thick in ditch on North side of bridge on the East side of road, elevation about 900'; Cherokee Quad; approximately 300 feet South of NW cor. Sec. 11, T.31S., R.23E., Crawford Co., Kansas.

CR-369 = Possible base of Fort Scott (Blackjack Creek) Limestone at 910' in road and along both sides of road with dense, hard, dark gray, massive limestone that weathers a dark yellowish orange brown in road and road ditch on East side of road below Fort Scott, in place???; looks like Verdigris, but

I can't believe it is in place; near Center of North line, NE1/4, Sec. 9, T.31S., R.23E., Crawford Co., Kansas.

CR-370 = Mudrock, gray and yellow brown, exposed in South facing stream bank East of road; near Center of West line, NW1/4, SW1/4, SW1/4, Sec. 3, T.31S., R.23E., Crawford Co., Kansas.

CR-371 = Sequence of limestone, sandstone, and mudrock along and in road ditch on East side of road; from SW cor. Sec. 3 northward for about 400 feet, T.31S., R.23E., Crawford Co., Kansas.