

KANSAS GEOLOGICAL SURVEY
OPEN-FILE REPORT 2000-20

Field Geology Maps Crawford County, Kansas

Preliminary Field Geology Maps For
Hiattville
Cato
Garland
Girard
1:24,000-scale Quadrangles

by

Ronald R. West
Robert S. Sawin

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KANSAS GEOLOGICAL SURVEY
1930 Constant Avenue
University of Kansas
Lawrence, KS 66047

FIELD GEOLOGY MAPS CRAWFORD COUNTY, KANSAS

Preliminary Field Geology Maps for

**HIATTVILLE
CATO
GARLAND
GIRARD**

1:24,000-Scale Quadrangles

Ronald R. West and Robert S. Sawin

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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 siliciclastic rocks in the lower Cabaniss Formation (Cherokee Group) to the mudrocks of the lower part of the Nowata Shale (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), noted above. On the right side of this sequence are the units and beds as shown on this map.

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

Top of Verdigris Limestone = V

Base of Blackjack Creek Limestone Member/top of Excello Shale Member = bF

Top of Higginsville Limestone Member/base of Labette Shale = tF

Top of Anna Shale Member/base of Myrick Station Limestone Member* = tA

Top of the Laberdie Limestone Member/base of Bandera Shale = tL

Base of Altamont Limestone/ top of Bandera Shale = bA

Top of Altamont Limestone/base of Nowata Shale = bN

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.

Pt = quarries, strip pits, and/or reclaimed areas.

* Note: 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.

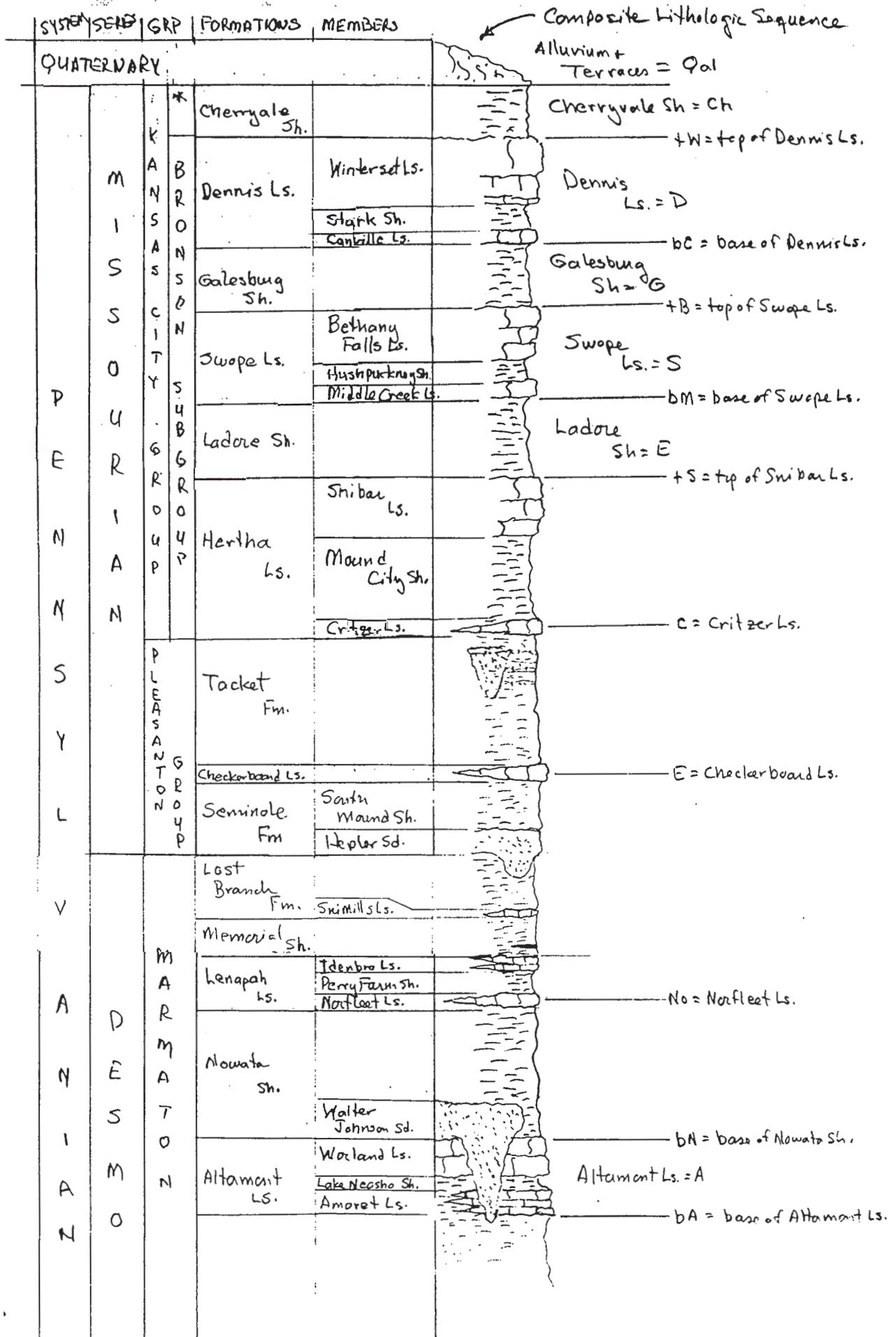
CRAWFORD COUNTY, KANSAS

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

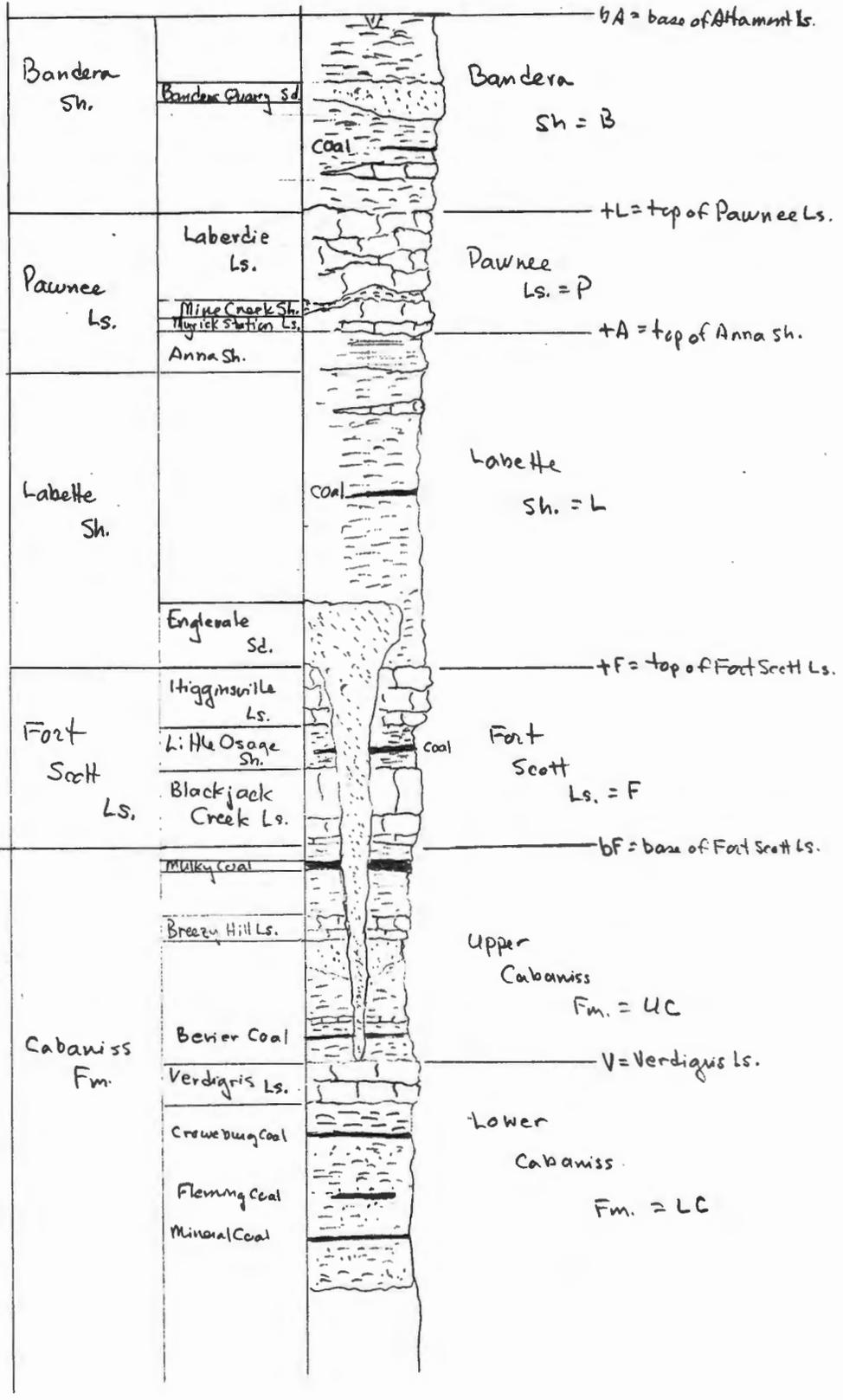


* Cherryvale Sh is the lowest formation of the Linn Subgroup

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- 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.
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CATO QUADRANGLE - CRAWFORD CO.

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 MEASURED SECTIONS 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 R.R. WEST HAS COLLECTED GEOLOGICAL SPECIMENS; AND

(3) NUMBERS PRECEDED BY THE LETTERS CR AND BB 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-6 = Verdigris (Ardmore) Limestone to Breezy Hill Limestone; abandoned strip pit and road cut on U. S. Highway 69; Center SW1/4, SW1/4, Sec. 32, T.27S., R.25E., Crawford Co., Kansas; measured and described by W. Howe, July, 1948.

C-7 = Coal and overlying limestone, possibly Verdigris Limestone, and shale; operating strip pit of Meade Coal Co.; Center NW1/4, SW1/4, Sec.28, T.27S., R.25E., Crawford Co., Kansas; measured and described by W. Howe, July 1948.

C-8 = Sequence similar to that at C-7; small operating strip pit by Morris Brothers; NW1/4, NW1/4, Sec.27, T.27S., R.25E., Crawford Co., Kansas; measured and described by W. Howe, August 1948.

C-30 = Sandstone below Breezy Hill Limestone, Squirrel, to Blackjack Creek Limestone; roadcut 6.3 miles North of Arma, Kansas on U. S. Highway 69; Center NW1/4, SW1/4, Sec. 5, T.28S., R.25E., Crawford Co., Kansas; measured and described by W. Howe, July 1948.

C-31 = Sequence similar to that at C-30; Center NW1/4, SE1/4, Sec. 5, T. 28S., R.25E., Crawford Co., Kansas; measured and described by R. C. Moore for 11th Annual KGS Field Conference, 1937.

C-32 = Sequence similar to that at C-30; roadcut 2.5 miles South of Bourbon-Crawford Co. line on U. S. Highway 69; Center West line Sec. 5, T.28S., R.25E., Crawford Co., Kansas; measured and described by J. Jewett, 1939

C-33 = Tebo Coal to Chelsea Sandstone; in road ditches at crossroads; SW corner Sec. 2, T.28S., R.25E., Crawford Co., Kansas; measured and described by W. Howe, July 1948.

BB-89 = Base of Fort Scott (Blackjack Creek) Limestone at 890'; ripplemarks in sandstones of the Lagonda, Breezy Hill limestone, Mulky Coal (1 dm), and Excello in road; blocks of Blackjack Creek limestone with in strip pit

- rubble; just East of Center of South line NW1/4, Sec. 25, T.27S., R.24E., Crawford Co., Kansas; Sawin Site #1.
- BB-90 = Top of Verdigris Limestone in the bed of Dry Wood Creek at 822'; near Center of East line NE1/4, SE1/4, SE1/4, Sec. 25, T.27S., R. 24E., Crawford Co., Kansas; Sawin Site #12.
- BB-91 = Top of Verdigris Limestone in drainage in field at 829'; just East of Center of North line, NW1/4, Sec. 30, T.27S., R.25E., Crawford Co., Kansas; Sawin Site #13.
- BB-94 = Base of Fort Scott (Blackjack Creek) Limestone at 883'; Center of West line of SW1/4, NW1/4, Sec. 25., T.27S., R.24E., Crawford Co., Kansas; Sawin Site #3.
- BB-95 = Base of Fort Scott (Blackjack Creek) Limestone at 906' with Excello, Mulky Coal, Breezy Hill limestone, and Lagonda below; near Center of North line of NW1/4, NE1/4, Sec. 25., T.27S., R.24E., on the Bourbon Co.-Crawford Co., Kansas line; Sawin Site #15, measure and describe carefully.
- BB-98 = Possible top of Verdigris Limestone at 835' in road ditch; near Center of North line, NE1/4, NW1/4, NW1/4, Sec. 29, T.27S., R.25E., on the Bourbon Co.-Crawford Co., Kansas line; Sawin Site #17.
- BB-99 = Mudrock and sandstone of Lagonda, traces of Mulky Coal, some underclay, Excello, and Blackjack Creek; base of Fort Scott (Blackjack Creek) Limestone at 919'; Breezy Hill limestone NOT SEEN; near Center of North line, NW1/4, NE1/4, Sec. 29, T.27S., R.25E., on the Bourbon Co.-Crawford Co., Kansas line; Sawin Site #18.
- BB-100 = Breezy Hill limestone, Mulky Coal (@0.5'), Excello, and Blackjack Creek; base of Fort Scott (Blackjack Creek) Limestone at 922' in road; near NE cor., Sec. 29, T.27S., R.25E., on the Bourbon Co.-Crawford Co., Kansas line; Sawin Site #19.
- BB-101 = Top of Verdigris Limestone at 836" in road ditch on South side of road; near Center of North line of NW1/4, NW1/4, NE1/4, Sec. 27, T.27S., R.25E., on the Bourbon Co.-Crawford Co., Kansas line; Sawin Site #20.
- BB-102 = Verdigris Limestone blocks in stream at 825', not in situ; near Center of North line of NE1/4, NW1/4, Sec. 26, T.27S., R.25E., on the Bourbon Co.-Crawford Co., Kansas line; Sawin Site #21.
- BB-103 = Sandstone of Lagonda Formation in road; near Center of the North line of NE1/4, NW1/4, Sec. 32, T.27S., R.25E., Crawford Co., Kansas.
- BB-104 = Top of Verdigris Limestone at 860'; using three widely spaced points on top of Verdigris dip was determined to be 2.6 degrees East and strike N 8 degrees East; near Center of North line of NW1/4, Sec. 33, T.27S., R.25E., Crawford Co., Kansas; Sawin Site #22.

- CR-10 = Poor exposure of sandstone in road ditch, probably the same as exposed at CR-9 in Garland Quad.; near Center of North line, NW1/4, Sec. 25, T.27S., R.25E., Crawford Co., Kansas.
- CR-11 = Blocks of Verdigris limestone and large concretions in stream, not in place; near Center of North line of NE1/4, NE1/4, Sec. 26, T. 27S., R. 25E., Crawford Co., Kansas.
- CR-12 = Three inches of dark gray, fossiliferous crystalline limestone above coal, probably the Mineral, at approx. 788' in North bank of stream on East side of road; approximately 200' East of Center of NW1/4, NE1/4, Sec. 26, T.27S., R.25E., Crawford Co., Kansas.
- CR-13 = Poor exposure of sandstone in road ditch on North side of road; Center of South line, SE1/4, NE1/4, Sec. 26, T.27S., R.25E., Crawford Co., Kansas.
- CR-14 = Sandstone, siltstone, and mudrock sequence above coal, probably Mineral, in North bank of stream on East side of road; small nodular limestone at 800' (water level on 27 December 1999) immediately above coaly to black shale sequence with in situ *Stigmara* about 2 feet long parallel to bedding; South of Old Arcadia Cemetery, near Center of SW1/4, NW1/4, Sec. 36, T. 27S., R. 25E., Crawford Co., Kansas.
- CR-15 = Blocks of Verdigris limestone in stream on East side of road at 810', not in place; near Center of East line, NW1/4, Sec. 26, T. 27S., R. 25E., Crawford Co., Kansas.
- CR-16 = Sandstone in road; near Center of South line, SE1/4, SE1/4, SE1/4, Sec. 26, T.27S., R.25E., Crawford Co., Kansas
- CR-17 = Verdigris limestone in road ditch on West side of road, top at 845'; new pond West of road with spoil pile containing blocks of Verdigris; approximately 150' North of Center of East line, NE1/4, SE1/4, Sec. 27, T. 27S., R. 25E., Crawford Co., Kansas.
- CR-18 = Good exposure of Verdigris showing the three limestone beds and intervening mudrocks in West facing highwall at East end of abandoned pit of Clemens Mine; good control point, top of Verdigris between 845' and 850'; approximately 200' West of Center of East line, SE1/4, SE1/4, Sec. 27, T. 27S., R.25E., Crawford Co., Kansas.
- CR-22 = Sandstone outcrop in stream on North side of road, probably Chelsea; near Center of South line, SW1/4, SE1/4, SE1/4, Sec. 2, T. 28S., R.25E., Crawford Co., Kansas.
- CR-23 = Sequence from stream bed South to section corner compares well with measured section C-33, Tebo Coal to Chelsea sandstone; along West side of Pleasant Valley Cemetery, approximately 400' North of SW corner, Sec. 2, T. 28S., R. 25E., Crawford Co., Kansas.
- CR-23A = Sandstone in road; near Center South line SE1/4, SE1/4, Sec. 3, T. 28S., R. 25E., Crawford Co., Kansas.

- CR-24 = Base of Fort Scott (Blackjack Creek) Limestone in road ditch on North side of road at 968'; typical Blackjack Creek and good Excello with some Breezy Hill limestone below; along road just West of SE corner Sec. 5, T. 28S., R. 25E., Crawford Co., Kansas.
- CR-25 = Verdigris limestone concretions in fields on both sides of road; near Center of South line, SW1/4, SW1/4, SE1/4, Sec. 4, T. 28S., R. 25E., Crawford Co., Kansas.
- CR-26 = Base of Fort Scott (Blackjack Creek) Limestone in road ditch on North side of road at 960'; Breezy Hill much better developed but distinctly pedogenic; approximately 100' East of Center of South line, SW1/4, SE1/4, Sec. 5, T. 28S., R. 25E., Crawford Co., Kansas.
- CR-27 = Base of Fort Scott (Blackjack Creek) Limestone in road at approx. 955'; approximately 200' East of Center of South line, SE1/4, SW1/4, Sec. 5, T. 28S., R.25E., Crawford Co., Kansas.
- CR-28 = Base of Fort Scott (Blackjack Creek) Limestone in road at approx. 945'; approximately 300' West of Center of South line, SW1/4, Sec. 5, T. 28S., R.25E., Crawford Co., Kansas.
- CR-29 = Base of Fort Scott (Blackjack Creek) Limestone in road and trench silo on West side of road at approx. 910'; Excello exposed below in road ditch on West side of road; near Center of South line, NW1/4, NW1/4, Sec. 36, T. 27S., R. 24E., Crawford Co., Kansas.
- CR-30 = Blocks of Blackjack Creek and Verdigris limestone in stream, nothing in place; near Center of South line, SW1/4, SW1/4, SE1/4, Sec. 31, T. 27S., R.25E., Crawford Co., Kansas.
- CR-31 = Large rectangular blocks of sandstone in stream and under bridge, nothing in place; just East of Center of South line, SW1/4, SW1/4, Sec. 6, T. 28S., R. 25E., Crawford Co., Kansas.
- CR-32 = Close to top of Verdigris Limestone at 860' in reclaimed field North of road; nothing in place; old strip pits must have been resulted from removal of Croweburg Coal; near Center of South line, SE1/4, Sec. 6, T. 28S., R. 25E., Crawford Co., Kansas.
- CR-33 = Inferred base of Fort Scott (Blackjack Creek) Limestone at 920' in road and ditch North of road, typical Blackjack Creek limestone; near Center of South line, SW1/4, SW1/4, Sec. 1, T. 28S., R. 24E., Crawford Co., Kansas.
- CR-34 = Lower Fort Scott (Blackjack Creek) Limestone in road; near Center of West line, Sec. 1, T. 28S., R. 24E., Crawford Co., Kansas.
- CR-35 = Poor exposure of base of Fort Scott (Blackjack Creek) Limestone in road ditch East of road with Excello Shale below; approximately 200' South of Center of West line, NW1/4, Sec. 1, T. 28S., R. 24E., Crawford Co., Kansas.
- CR-36 = VERY poor exposure of base of Fort Scott (Blackjack Creek) Limestone at 923', **DO NOT USE!**; approximately 150' North of SW corner, Sec. 36, T. 27S., R. 24E., Crawford Co., Kansas.

- CR-37 = Approximately one meter of Fort Scott (Blackjack Creek) Limestone with Excello Shale below exposed in old strip pit North of road, base of Fort Scott (Blackjack Creek) Limestone at approximately 920'; 200' North and 400' West of SE corner, Sec. 35, T. 27S., R.24E., Crawford Co., Kansas.
- CR-38 = Blackjack Creek limestone exposed around pond Northwest of road junction; near Center of SE1/4, SE1/4, SE1/4, Sec. 2, T. 28S., R. 24E., Crawford Co., Kansas.
- CR-39 = Base of Fort Scott (Blackjack Creek) Limestone at 910' in road; near Center of South line, SE1/4, SW1/4, SE1/4, Sec. 2, T. 28S., R.24E., Crawford Co., Kansas.
- CR-40 = Base of Fort Scott (Blackjack Creek) Limestone at 910' in road; near Center of South line, SW1/4, SW1/4, SE1/4, Sec. 2, T. 28S., R. 24E., Crawford Co., Kansas.
- CR-57 = Exposure of Excello and all members of Fort Scott Limestone on both sides of stream where road crosses stream, base of Fort Scott (Blackjack Creek) Limestone at 910' with at least 16 feet (10 feet of Blackjack Creek limestone) of Fort Scott exposed with top estimated at 930'; Little Osage shale is exposed in road ditches; near the Center, and East of Center, of South line, SE1/4, SW1/4, SE1/4, Sec. 35, T. 27S., R. 24E., Crawford Co., Kansas
- CR-58 = Base of Fort Scott (Blackjack Creek) Limestone at 885' in road ditch North of road and in old strip pit North of road; Little Osage shale and Higginsville limestone exposed in road West of this site; approximately 0.4 mile West of Cato, near Center of South line, SW1/4, NE1/4, Sec. 26, T. 27S., R. 24E., Crawford Co., Kansas
- CR-83 = Breezy Hill limestone in place in roadcut below soil on east side of U.S. Highway 69 at @ 950'; pedogenic, like Breezy Hill exposed in stream along West side of U.S. Highway 69 in Fort Scott, Kansas; blocks of Blackjack creek limestone at top of roadcut on West side of U.S. Highway 69; near center of East line of NE1/4, NE1/4, Sec. 7, and near Center of West line of NW1/4, NW1/4, Sec. 8 T.28S., R.25E., Crawford Co., Kansas.
- CR-84 = Base of Fort Scott (Blackjack Creek) Limestone at 943' based on KDOT profile of U.S. Highway 69; slight dip to the north/northwest; upper Cabaniss formation to Breezy Hill limestone and Excello shale exposed below the 6 to 8 feet of Blackjack Creek, upper 2.5 to 3 feet of Blackjack Creek with developed pedogenic features; near center of West line of SE1/4, NE1/4, SE1/4, Sec. 6 and near Center of east line of SW1/4, NW1/4, SW1/4, Sec. 5, T.28S., R.25E., Crawford Co., Kansas.
- CR-85 = Sandstone in upper part of Cabaniss, Lagonda, in roadcut on East side of U.S. Highway 69 at @ 940'; near Center of west line SW1/4, SW1/4, SW1/4, Sec. 32, T. 27S., R. 25E., Crawford Co., Kansas.
- CR-86 = Base of Fort Scott (Blackjack Creek) Limestone at @ 950' on the South side of road with Excello shale below, Breezy Hill limestone in contact with Lagonda sandstone below at @940' in road ditch on North side of

road; near Center of South line of SW1/4, SW1/4, Sec. 32, T. 27S., R. 25E., and near Center of North line of NW1/4, NW1/4, Sec. 5, T. 28S., R. 25E., Crawford Co., Kansas.

CR-87 = Base of Fort Scott (Blackjack Creek) Limestone at @ 945' at top of hill on the west side of U.S. Highway 69; near Center of West line of NE1/4, SE1/4, NE1/4, Sec. 6, T. 28 S., R. 25E., Crawford Co., Kansas.

CR-88 = Limestone blocks forming dam for pond on North side of road; near Center of South line of SE1/4, SE1/4, Sec. 6, T. 28S., R.25E., Crawford Co., Kansas.

GARLAND QUADRANGLE - CRAWFORD COUNTY

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

CR-1 = Sandstone in road along State Line, probably Chelsea; along the Missouri-Kansas State line, approximately 200' West and 200' North of Center of South line, SE1/4, Sec. 36, T. 27S., R. 25E., Crawford Co., Kansas.

CR-2 = Sandstone in road along State Line, probably Chelsea; along the Missouri-Kansas State line, approximately 200' West and 200' North of Center of South line, NE1/4, Sec. 36, T. 27S., R. 25E., Crawford Co., Kansas.

CR-3 = Sandstone in road along State Line, probably Chelsea; along the Missouri-Kansas State line, approximately 200' West of the Center of the South 1/2, SE1/4, Sec. 25, T.27S., R.25E., Crawford Co., Kansas.

CR-4 = Sandstone in road along State Line, probably Chelsea; along the Missouri-Kansas State line, approximately 400' North of CR-3 in SE1/4, Sec. 25, T. 27S., R.25E., Crawford Co., Kansas.

CR-5 = Sandstone in road along State Line, probably Chelsea; along the Missouri-Kansas State line, approximately 200' North of CR-4 in SE1/4, Sec. 25, T.27S., R.25E., Crawford Co., Kansas.

CR-6 = Sandstone in road along State Line, probably Chelsea; along the Missouri-Kansas State line, approximately 200' West and 300' South of Center of North line, SE1/4, Sec. 25, T.27S., R.25E., Crawford Co., Kansas.

CR-7 = Sandy soil in fields at road intersection; near Center of NE1/4, NW1/4, NE1/4, Sec. 25, T.27S., R.25E., Crawford Co., Kansas.

CR-8 = Large limestone concretions typical of the Verdigris interval in field South of road at approx. 865'; near Center North line of Sec. 25, T.27S., R.25E., Crawford Co., Kansas.

CR-9 = Good exposure of reddish brown sandstone outcrops in road at 860'; approximately 300' West of CR-8 along North line of Sec. 25, T.27S., R.25E., Crawford Co., Kansas.

CR-19 = Blocks of sandstone in creek; approximately 400' North of Center of South1/2, Sec. 1, T.28S., R. 25E., Crawford Co., Kansas.

CR-20 = Sandstone in road; approximately 200' South of Center of South1/2, Sec. 1, T.28S., R. 25E., Crawford Co., Kansas.

CR-21 = Sandstone in road just North of road junction; just North of Center of South line of Sec. 1, T.28S., R. 25E., Crawford Co., Kansas.

GIRARD QUADRANGLE

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C-19 = Squirrel Sandstone to Blackjack Creek Limestone interval between black shale (Excello) and sandstone covered; exposure in strip pit and creek bank; Center NW1/4, NE1/4, Sec. 15, T.28S., R.24E., Crawford Co., Kansas; measured and described by W. Howe, July 1948.

C-20 = Myrick Station and Laberdie limestones; roadcut near Center South line, Sec. 33, T.28S., R.24E., Crawford Co., Kansas; measured and described by J. Jewett, 1940

- C-21 = Little Osage Shale to Higginsville Limestone; roadcut West of Englevale, Kansas; near Center of South line, Sec. 15, T.28S., R.24E., Crawford Co., Kansas; measured and describe by J. Jewett, 1940
- C-22 = Fort Scott Limestone in Blackjack Creek Limestone; Sec. 11, T.28S., R.24E., Crawford Co., Kansas, measured and describe by J. M. Jewett, 1939.
- C-23 = Sandstone below Breezy Hill Limestone to Higginsville Limestone, sandstone pavement in creek; Sec. 11, T.28S., R. 24E., Crawford Co., Kansas; measured and described by J. M. Jewett, 1941; measured section 108 in Jewett, 1945, p.107-108, Fort Scott is 35.21' thick here.
- C-40 = Pawnee Limestone in WPA Quarry North of road; SE corner, Sec. 11, T.29S., R. 23E., Crawford Co., Kansas, measured and describe by J. M. Jewett, 1939.
- C-42 = Houx and Higginsville limestones with some black shale below; quarry 0.5 miles East of Girard, Kansas on South side of U. S. Highway 57; Center of North line, Sec. 19, T.29S., R.24E., Crawford Co., Kansas; measured and described by J. Jewett, 1939.
- L-705 = Exposure of Mulky coal, Excello shale up to upper beds of Blackjack Creek limestone in roadcut on North side of road, poorly exposed when visited in 1985; Moore (1949) locality 2, GSA Memoir 39, p. 9, fig. 4, now isolated by two inlets of Bone Creek Reservoir; near SW corner, Sec. 11, T.28S., R.24E., Crawford Co., Kansas.
- L-814 = Base of Fort Scott (Blackjack Creek) Limestone is approx. 11' above lake level of 900', thus at @911', sequence from Excello shale to near top of Fort Scott (Higginsville) Limestone present but poorly exposed; near Center of South line of Sec. 11, and near Center of North line of Sec. 14, T.28S., R.24E., Crawford Co., Kansas.
- CR-89 = Limestone like Myrick Station in road at 1000'; Center South line of SW1/4, SW1/4, SW1/4, Sec. 15, T. 28S., R.24E., Crawford Co., Kansas.
- CR-90 = Top of Fort Scott (Higginsville) Limestone at @ 935' in field on South side of road; Little Osage shale in creek on South side of road with about 12' of Higginsville limestone above, lower 6' is a thin, wavy bedded, light gray, fossiliferous, algal limestone, upper 6' partially covered with upper part; just South of center of North line of NW1/4, NW1/4, NE1/4, Sec. 22, T.28S., R.24E., Crawford Co., Kansas.
- CR-91 = Top of Fort Scott (Higginsville) Limestone at @ 940' in road based on old map of this area; no exposure, but a reasonable point; near Center of South line of SW1/4, Se. 14, .28S., R.24E., Crawford Co., Kansas.
- CR-92 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone in road at @1000'; Center of West line of SW1/4, SW1/4, Sec. 15, T.28S., R.24E., Crawford Co., Kansas.
- CR-93 = Sandstone in road at 970', probably Englevale; Center of West line of SW1/4, NW1/4, SW1/4, Sec. 15, T.28S., R.24E., Crawford Co., Kansas.

- CR-94 = Top of Fort Scott (Higginsville) Limestone well exposed in road at @933', upper part like that at CR-90, same limestone also exposed below barn in field West of road; Center of West line of Sec. 15, T.28S., R.24E., Crawford Co., Kansas.
- CR-95 = Top of Fort Scott (Higginsville) Limestone at @ 933' in partial exposure in pond East of road, similar to exposure at CR-94; Center of West line of SW1/4, NW1/4, NW1/4, Sec. 15, T.28S., R.24E., Crawford Co., Kansas.
- CR-96 = Thin limestone probably in place in road in the Labette Shale; Center of West line of NW1/4, NW1/4, SW1/4, Sec. 10, T.28S., R.24E., Crawford Co., Kansas.
- CR-97 = Base of Fort Scott (Blackjack Creek) Limestone at 910' just above lake level at Leaning Tree Boat Ramp, Excello shale exposed below; approx. 300' SE of the Center of SW1/4, SE1/4, Sec. 10, T.28S., R.24E., Crawford Co., Kansas.
- CR-98 = Base of Fort Scott (Blackjack Creek) Limestone at 910' just above lake level, Excello shale exposed below with Breezy Hill limestone at lake level (900'); Center of South line of SW1/4, SW1/4, SE1/4, Sec. 10., T.28S., R.24E., Crawford Co., Kansas.
- CR-99 = Thin bed of light gray, dense limestone in Labette Shale like that at CR-96 at 955' in road; Center of South line of SE1/4, SE1/4, Sec. 9, T.28S., R.24E., Crawford Co., Kansas.
- CR-99A = Thin bed of dark gray to black, clayey, fossiliferous (abundant linoproductid brachiopods) limestone in Labette Shale at 970' in road, like blocks seen in fill used near CR-98; near Center of South line of SW1/4, SE1/4, SE1/4, Sec. 9, T.28S., R.24E., Crawford Co., Kansas.
- CR-100 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @995' in road ditch on North side of road, limestone is thin beds of light brownish gray, sandy carbonate, large blocks of vuggy, algal limestone (Laberdie) exposed in field North of road; approx. 150' East of center of South line of SE1/4, SW1/4, Sec. 9, T.28S., R.24E., Crawford Co., Kansas.
- CR-101 = Pawnee (Laberdie) Limestone in fields on both sides of road at @ 1025'; Center of South line of SW1/4, SW1/4, Sec. 9, T.28S., R.24E., Crawford Co., Kansas.
- CR-102 = Pawnee (Laberdie) Limestone in fields on both sides of road at @ 1010'; approx. 400' North of Center of West line of Sec. 9, T.28S., R.24E., Crawford Co., Kansas.
- CR-103 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @995' in road ditch on West side of road, limestone is thin beds of light brownish gray, sandy carbonate; approx. 300' South of Center of East line of NE1/4, Sec. 17, T.28S., R.24E., Crawford Co., Kansas.
- CR-104 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @996' in road ditch on East side of road, limestone is thin beds of light brownish gray, sandy to clayey carbonate, similar to CR-103 but the

exposure is better of both the shale and limestone; near Center of West line of SW1/4, NW1/4, SW1/4, Sec. 16, T.28S., R.24E., Crawford Co., Kansas.

CR-105 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at 1000' in field Northwest of Section Corner and in West side of road going North from the Section Corner of road; Anna and Myrick Station are lithologically the same as at CR-103, but both are thin and the Mine Creek is very thin or absent; at SE cor. f Sec. 17, T.28S., R.24E., Crawford Co., Kansas.

CR-106 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1000' in road, same as at CR-105 but newer exposure; Center of South line of SW1/4, SE1/4, Sec. 16, T.28S., R.24E., Crawford Co., Kansas.

CR-107 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1000' in road as at CR-106; Center of West line of NE1/4, NE1/4, Sec. 21, T.28S., R.24E., Crawford Co., Kansas.

CR-108 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1000' in road around top of hill, as at CR-106; two points along West line of SE1/4, NE1/4, Sec. 21, T.28S., R.24E., Crawford Co., Kansas.

CR-109 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1010' in road, otherwise like at CR-106; approx. 300' South of Center of East line of SE1/4, Sec. 21, T.28S., R.24E., Crawford Co., Kansas.

CR-110 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1015' in road, otherwise like at CR-106; approx. 100' East of Center of North line of NW1/4, Sec. 27, T.28S., R.24E., Crawford Co., Kansas.

CR-111 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1015' in road, otherwise like at CR-106; Center of north line of NW1/4, Sec. 26, T.28S., R.24E., Crawford Co., Kansas.

CR-112 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1015' in road, poor contact but usable via old map of this area; two points along East end of North line of NE1/4, Sec. 34, T.28S., R.24E., Crawford Co., Kansas.

CR-113 = Inferred top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1010' in road, like CR-112; Center of North line of NW1/4, NW1/4, Sec. 34, T.28S., R.24E., Crawford Co., Kansas.

CR-114 = Inferred top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1010' in road, like CR-112; approx. 200' East of Center of North line of NE1/4, Sec. 33, T.28S., R.24E., Crawford Co., Kansas.

CR-115 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1012' in road ditch South of road, both appear to be quite thin with Laberdie limestone in field North of road; approx. 500' East of NW corner of Sec. 3, T.29S., R.24E., Crawford Co., Kansas.

- CR-116 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1025' in road and fields on both sides of road, poor exposure but usable; Center of North line of NE1/4, Sec. 3, T.29S., R.24E., Crawford Co., Kansas.
- CR-117 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1025' in road with Myrick Station limestone also exposed in pond bank in field east of road, similar to CR-116; approx. 350' South of Center of West line of NW1/4, SW1/4, Sec. 35, T.28S., R.24E., Crawford Co., Kansas.
- CR-118 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1022' in road, poor but usable, blocks of limestone in field South of road; Center of North line of NE1/4, NW1/4, Sec. 35, T.28S., R.24E., Crawford Co., Kansas.
- CR-119 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1002' in road, poor like at CR-118 but usable; approx. 100' West of Center of North line of NE1/4, NE1/4, Sec. 5, T.29S., R.24E., Crawford Co., Kansas.
- CR-120 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1010' in road, poor like at CR-118 but usable; approx. 400' west of Center of North line of Sec. 33, T.28S., R.24E., Crawford Co., Kansas.
- CR-121 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1000' in road, fairly good exposure of lower Pawnee Limestone in old roadcut East of county road, also exposed in field West of road and South of pond, wet weather spring; Center of West line of NW1/4, SW1/4, NW1/4, Sec. 21, T.28S., R.24E., Crawford Co., Kansas.
- CR-122 = Pawnee (Laberdie) Limestone in fields on both sides of road at 990'; approx. 100' West of Center of North line of Sec. 18, T.28S., R.24E., Crawford Co., Kansas.
- CR-123 = Top of Pawnee (Laberdie) Limestone at 980', 6 to 8 feet of medium to thin bedded, vuggy, algal limestone forms a waterfall below dam of Frisco Lake just North of Farlingville, Kansas; approx. 200' NW of Center of North 1/2 of SW1/4, Sec. 7, T.28S., R.24E., Crawford Co., Kansas.
- CR-124 = Thin bedded to platy, light gray to brownish, silty mudrocks and clayey siltstones of Bandera Shale in road ditch on North side of road at 1010'; Center of South line of SE1/4, SW1/4, Sec. 12, T.28S., R.23E., Crawford Co., Kansas.
- CR-125 = Thin limestone in road, possibly a limestone in the lower part of Nowata Shale; two points North and South of Center of West line of SE1/4, SE1/4, Sec. 12, T.28S., R.23E., Crawford Co., Kansas.
- CR-126 = Bandera Shale below house at 1030+'; just East of Center of West line of SW1/4, Sec. 11, T.28S., R.23E., Crawford Co., Kansas.
- CR-127 = Reddish brown, ferruginous sandstone of Bandera Shale at @1055'; near Center of North line of NE1/4, Sec. 23, T.28S., R.23E., Crawford Co., Kansas.

- CR-128 = Sandstone of Bandera Shale in road ditch on North side of road to 1030'; approx. 400' West of Center of South line of SE1/4, Sec. 23, T.28S., R.23E., Crawford Co., Kansas.
- CR-129 = Near top of Pawnee (Laberdie) Limestone in field South of road at 999'; approx. 200' west of Center of North line of NE1/4, Sec. 35, T.28S., R.23E., Crawford Co., Kansas.
- CR-130 = Near top of Pawnee (Laberdie) Limestone in road at 995'???; near Center of North line of NW1/4, NE1/4, Sec. 36, T.28S., R.23E., Crawford Co., Kansas.
- CR-131 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone poorly exposed but present in road ditch on West side of road at 990'; Center of East line of Sec. 31, T.28S., R.24E., Crawford Co., Kansas.
- CR-132 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone poorly exposed but present in road at 985', similar to CR-131; near Center of East line of SE1/4, NE1/4, SE1/4, Sec. 31, T.28S., R.24E., Crawford Co., Kansas.
- CR-133 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone poorly exposed but present in road at 980', similar to CR-131; Center of East line of SE1/4, SE1/4, Sec. 31, T.28S., R.24E., Crawford Co., Kansas.
- CR-134 = Base of Fort Scott (Blackjack Creek) Limestone in road at @960', Blackjack Creek limestone and Excello shale poorly exposed in road ditch, fits with old geologic map of area; approx. 100' West of Center of South line of SE1/4, SW1/4, Sec. 21, T.29S., R.24E., Crawford Co., Kansas, RADLEY QUAD.
- CR-135 = Base of Fort Scott (Blackjack Creek) Limestone in road at @960', Blackjack Creek limestone and Excello shale poorly exposed in road ditch, fits with old geologic map of area; approx. 200' West of Center of South line of SW1/4, SE1/4, Sec. 21, T.29S., R.24E., Crawford Co., Kansas, RADLEY QUAD.
- CR-136 = Base of Fort Scott (Blackjack Creek) Limestone at @965' based on topography and old geologic map of area; soils map of county indicates a narrow linear band of limestone oriented NW-SE; approx. 200' North of Center of East line of NE1/4, sec. 21, T.29S., R.24E., Crawford Co., Kansas.
- CR-137 = Base of Fort Scott (Blackjack Creek) Limestone estimated at @980', thin Blackjack Creek limestone covered by a thin soil, Excello shale below based on a recent excavation; approx. 100' South of Center of East line of SE1/4, SE1/4, Sec. 15, T.29S., R.24E., Crawford Co., Kansas.
- CR-138 = No exposure, but reasonable base of Fort Scott (Blackjack Creek) Limestone at @975' using old geologic map of area and float associated with old strip pits where Mulky coal was removed; near Center of South line of SW1/4, SW1/4, Sec. 11, T.29S., R.24E., Crawford Co., Kansas.
- CR-139 = Limestone and black shale float in stream on North side of road, probably Higginsville limestone and Little Osage shale, probably near the top of Fort Scott (Blackjack Creek) Limestone at @965' based on old

- geologic map of area; approx. 200' East of Center of North line of NW1/4, NW1/4, Sec. 9, T.29S., R.24E., Crawford Co., Kansas.
- CR-140 = Possibly base of Fort Scott (Blackjack Creek) Limestone at @950' based on float and type of soil on soils maps of county very poor exposure; Center of South line of SW1/4, Sec. 9, T.29S., R.24E., Crawford Co., Kansas.
- CR-141 = Possibly base of Fort Scott (Blackjack Creek) Limestone at @950' along stream on South side of road, based on float and type of soil on soils maps of county very poor exposure; approx. 200' East and 200' South of Center of North line of Sec. 17, T.29S., R.24E., Crawford Co., Kansas.
- CR-142 = Exposure of Higginsville limestone and Little Osage shale in road ditch along South side of road, approx. 3.5' of Little Osage and 6.0' of Higginsville algal limestone, along the West side of stream SE of CR-142 approx. 3.0' of Blackjack Creek limestone exposed; top of Blackjack Creek limestone at 953'; assuming a total thickness for the Fort Scott Limestone of 36.7' (Higginsville limestone = 22.4', Little Osage shale = 3.5', and Blackjack Creek limestone = 10.8') based on KDOT profile just east of Girard, Kansas along Kansas Highway 57, the base of the Fort Scott Limestone is at 942.2' and top is at 978.9'; along North side of NW1/4, NE1/4, NE1/4, Sec. 18, T.29S., R.24E., and diagonally across NE1/4, NE1/4, NE1/4, Sec. 18, T.29S., R.24E., Crawford Co., Kansas.
- CR-143 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1000' based on float in field on North side of road; near Center of South line of SW1/4, SW1/4, SE1/4, Sec. 1, T.29S., R.23E., Crawford Co., Kansas.
- CR-144 = Limestone exposed in field NE of section corner, probably a limestone in the Labette Shale; SW corner, Sec. 11, T.29S., R.23E., Crawford Co., Kansas.
- CR-145 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at @1000' in road; Center of East line of SE1/4, SE1/4, Sec. 11, T.29S., R.23E., Crawford Co., Kansas.
- CR-146 = Possibly Myrick Station stone fences limestone in Pawnee Limestone in field on East side of road; Center of West line of NW1/4, SW1/4, Sec. 2, T.29S., R.23E., Crawford Co., Kansas.
- CR-147 = Laberdie limestone exposed in road ditch on South side of road at 980'; near Center of North line of NW1/4, NW1/4, NE1/4, Sec. 11, T.29S., R.23E., Crawford Co., Kansas.
- CR-148 = Laberdie limestone in field East of road at @995' and stone fences made of what appears to be Myrick Station limestone in field on West side of road; Center of West line of NW1/4, Sec. 1, T.29S., R.23E., Crawford Co., Kansas.
- CR-149 = Laberdie limestone in field East of road at @1002'; just East of Center of West line of Sec. 36, T.28S., R.23E., Crawford Co., Kansas.

CR-150 = What appears to be Myrick Station limestone in pond bank South of road at @ 980'; diagonally SE of Center of North line of NW1/4, NW1/4, Sec. 31, T.28S., R.24E., Crawford Co., Kansas.

HIATTVILLE QUADRANGLE - CRAWFORD CO.

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 MEASURED SECTIONS 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 R.R. WEST HAS COLLECTED GEOLOGICAL SPECIMENS; AND

(3) NUMBERS PRECEDED BY THE LETTERS **CR** AND **BB** 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-5 = Laberdie Limestone; old quarry; just West of Center of East line, SW1/4, Sec. 31, T. 27S., R.24E., Crawford Co., Kansas; measured and described by W. Ives, August 1952.

BB-55 = Top of Anna shale at 950'; Sawin Site #3, Bennison measured 75' of Labette Shale here; Center of East line of SE1/4, SE1/4, Sec. 32, T.27S., R.24E., Crawford Co., Kansas.

BB-56 =Top of Fort Scott (Higginsville) Limestone at 880'; in bed of West Branch of Dry Wood Creek just West of Center of North line of SW1/4, SW1/4, Sec. 33, T.27S., R.24E., Crawford Co., Kansas.

BB-57 = Top of Anna shale at 950'; Sawin Site #21; in road just South of Center of East line of NE1/4, NE1/4, Sec. 32, T/27S., R.24E., Crawford Co., Kansas.

BB-58 = Earthy limestone below Anna shale associated with coaly smut; near Center of North line of NE1/4, NW1/4, NE1/4, Sec. 33, T.27S., R.24E., Crawford Co., Kansas.

BB-59 = Englevale Sandstone in creek, sandstone appears to strike North-South with a NW dip suggesting a plunging anticline or an isoclinal fold??; near Center of East line of SE1/4, Sec. 28, T27S., R24E., Crawford Co., Kansas.

BB-63 = Top of Anna shale at 975' just below top of hill which is at an elevation of 981'; Center of South line of Sec. 28, T.27S., R.24E., Crawford Co., Kansas.

- BB-86 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at 972'; Sawin Site #9; just North of Center of North line of NW1/4, NW1/4, Sec. 25, T.27S., R.24E., Bourbon-Crawford County line, Kansas.
- CR-41 = Base of Fort Scott (Blackjack Creek) Limestone estimated at 900' on the basis of the top of the Blackjack Creek limestone which is exposed in the fields on both sides of the road, well seen in the West bank of the stream on the South side of the road; Little Osage shale and Higginsville limestone exposed East of this site in the road and at the top of the hill, estimated thickness of Fort Scott Limestone is 20'to 25'; near Center of North line, NE1/4, NW1/4, Sec. 11, T. 28S., R. 24E., Crawford Co., Kansas.
- CR-42 = Blackjack Creek limestone in creek with top just below road level and in field North of road; near Center of North line, NW1/4, Sec. 11, T. 28S., R. 24E., Crawford Co., Kansas.
- CR-43 = Light gray, thin, wavy bedded, skeletal limestone, Higginsville; upper beds of Fort Scott (Higginsville) Limestone at 923' in road; near Center of South line, SW1/4, SW1/4, Sec. 2, T. 28S., R. 24E., Crawford Co., Kansas.
- CR-44 = Estimated base (contact covered) of Pawnee (Myrick Station) Limestone/top of Anna shale at 980' in road ditch; approximately 200' South of Center of West line, SW1/4, SW1/4, Sec. 3, T. 238S., R. 24E., Crawford Co., Kansas.
- CR-45 = Blocks of Pawnee (Laberdie) Limestone in road and field East of road; near Center of West line, Sec. 4, T. 28S., R. 24E., Crawford Co., Kansas.
- CR-46 = Blocks of Pawnee (Laberdie) Limestone in fields in all directions; NW corner, Sec. 33, T. 27S., R. 24E., Crawford Co., Kansas.
- CR-47 = Base of Pawnee (Myrick Station) Limestone/top of Anna shale at 950' in road; near Center of South line, SE1/4, SW1/4, NW1/4, Sec. 27, T. 27S., R. 24E., Crawford Co., Kansas.
- CR-48 = Sandstone in creek North of road, possibly Englevale; approximately 200' West of Center Sec. 27, T. 27S., R. 24E., Crawford Co., Kansas.
- CR-49 = Top of very hard, dense, bluish gray, weathers orangish brown, limestone at approximately 925' forms bed of creek, possibly limestone in Bandera Shale; approximately 100' East and 200' North of Center of South line, SW1/4, SE1/4, Sec. 24, T. 27S., R. 23E., Bourbon Co., Kansas.
- CR-50 = Sandstone in road at top of hill; approximately 300' West of Center of North line, NW1/4, Sec. 25, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-51 = Sandstone in road at top of hill; approximately 250' east of Center of North line, Sec. 26, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-52 = Sandy soil in fields Northwest, Northeast, and Southeast of section corner; NW corner Sec. 26, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-53 = Sandstone in road; near Center of West line, SW1/4, NW1/4, NW1/4, Sec. 26, T. 27S., R. 23E., Crawford Co., Kansas.

- CR-54 = Limestone in road at 990', probable base of Altamont Limestone; near Center of West line, NW1/4, SW1/4, Sec. 26, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-55 = Reddish brown, friable sandstone in place in stream bed on West side of road; near Center of East line, NE1/4, SE1/4, SE1/4, Sec. 27, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-56 = Estimated top of Anna shale/ base of Pawnee (Myrick Station) Limestone at 990' in field; lot of Myrick Station and Laberdie limestone float along top of ridge; mudrock and siltstone of Labette Shale exposed in gullies and stream Northwest of ridge; near Center of West line, NW1/4, Sec. 2, T. 28S., R. 24E., Crawford Co., Kansas.
- CR-56A = Sandstone in Labette Shale in drainage below pond; approximately 100' North and 300' East of Center of West line, NW1/4, NW1/4, Sec. 2, T. 28S., R. 24E., Crawford Co., Kansas.
- CR-59 = Labette Shale at top of hill and in fields at road intersection; Center of West line, Sec. 26, T. 27S., R. 24E., Crawford Co., Kansas.
- CR-60 = Sandstone in field West of road; near Center of East line, NE1/4, SE1/4, NE1/4, Sec. 30, T. 27S., R. 24E., Crawford Co., Kansas.
- CR-61 = Sandstone, siltstone, and mudrock in drainage with Bandera Shale soil in fields; near Center of South line, Sec. 30, T. 27S., R. 24E., Crawford Co., Kansas.
- CR-62 = Sandstone in road; near Center of South line, SW1/4, Sec. 30, T. 27S., R. 24E., Crawford Co., Kansas.
- CR-63 = Estimated top of Pawnee (Laberdie) Limestone in field at 940' based on float in field and drainage East of road; near Center of NE1/4, SW1/4, SW1/4, Sec. 29, T. 27S., R. 24E., Crawford Co., Kansas.
- CR-64 = Estimated top of Pawnee (Laberdie) Limestone at 965' on East side of Farlington Lake; Laberdie is an algal limestone and exposed around the entire lake; near Center, SE1/4, NW1/4, Sec. 5, T. 28S., R. 24E., Crawford Co., Kansas.
- CR-65 = Estimated top of Anna shale/base of Pawnee (Myrick Station) Limestone at 935' in exposure along Southeast side of road; Mine Creek Shale is only a shaley parting if present; Laberdie is mostly an algal limestone and Myrick Station is a hard, dense, reddish brown slightly skeletal limestone; estimated thickness of Pawnee Limestone is 25 feet; near Center SW1/4, SW1/4, Sec. 32, T. 27S., R. 24E., Crawford Co., Kansas.
- CR-66 = Top of Anna shale/base of Pawnee (Myrick Station) Limestone at 920' in drainage Northeast of active quarry; sequence similar to that at CR-65; near Center SE1/4, NW1/4, SE1/4, Sec. 31, T. 27S., R. 24E., Crawford Co., Kansas.

- CR-66A = Active quarry in Pawnee Limestone, total thickness 25+ feet, top at 950'; sequence much like that at CR-65 and CR-66; Laberdie limestone is mostly algal; near Center of East 1/2, SW 1/4, Sec. 31, T. 27S., R. 24E., Crawford Co., Kansas.
- CR-67 = Altamont Limestone at 1018' in road (BASE OR TOP ??); approximately 150' East of Center of North line NW 1/4, NE 1/4, Sec. 36, T. 27S., R. 23E., Crawford Co., Kansas
- CR-68 = Sandstone in fields on both sides of road; along North line, NE 1/4, NE 1/4, NW 1/4, Sec. 36, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-69 = Altamont Limestone at 997' in road (BASE OR TOP??); approximately 100' West of Center of North line, NE 1/4, NE 1/4, Sec. 35, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-70 = Altamont Limestone at 995' in road (BASE OR TOP); near Center of North line NW 1/4, Sec. 35, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-71 = Altamont Limestone at 995' in road (BASE OR TOP); approximately 100' North of Center of West line SW 1/4, NW 1/4, Sec. 35, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-72 = Altamont Limestone at 990' in road ditch and in drainage West of road (BASE OR TOP ??); near Center of West line SW 1/4, SW 1/4, NW 1/4, Sec. 35, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-73 = Sandstone in road; just West of Center of South line SE 1/4, SE 1/4, Sec. 35, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-74 = Sandstone in road; near Center of South line SW 1/4, SE 1/4, SW 1/4, Sec. 36, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-75 = Sandstone in road; approximately 200' East of Center of South line SW 1/4, SE 1/4, Sec. 36, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-76 = Sandstone in road; just East of Center of South line SE 1/4, SE 1/4, Sec. 35, T. 27S., R. 23E., Crawford Co., Kansas.
- CR-77 = Sandstone in road; along South line SE 1/4, SE 1/4, SE 1/4, Sec. 1, T. 28S., R. 23E., Crawford Co., Kansas.
- CR-78 = Estimated top of Altamont Limestone at 1040' in road; near Center of South line SE 1/4, SW 1/4, SE 1/4, Sec. 1, T. 28S., R. 23E., Crawford Co., Kansas.
- CR-79 = Estimated top of Altamont Limestone at 1030' in road; near Center of South line SW 1/4, SW 1/4, SW 1/4, Sec. 1, T. 28S., R. 23E., Crawford Co., Kansas.
- CR-80 = Estimated top of Altamont Limestone at 1025' in road; just South of Center of West line NW 1/4, SE 1/4, NE 1/4, Sec. 2, T. 28S., R. 23E., Crawford Co., Kansas.

CR-81 = Estimated top of Altamont Limestone at 1025' in road; near Center of N1/2, NE1/4, Sec. 2, T. 28S., R. 23E., Crawford Co., Kansas.

CR-82 = Estimated base of Altamont Limestone at 1015' in road; approximately 100' West of CR-73 along the North line of NE1/4, NE1/4, Sec. 2, T. 28S., R. 23E., Crawford Co., Kansas.