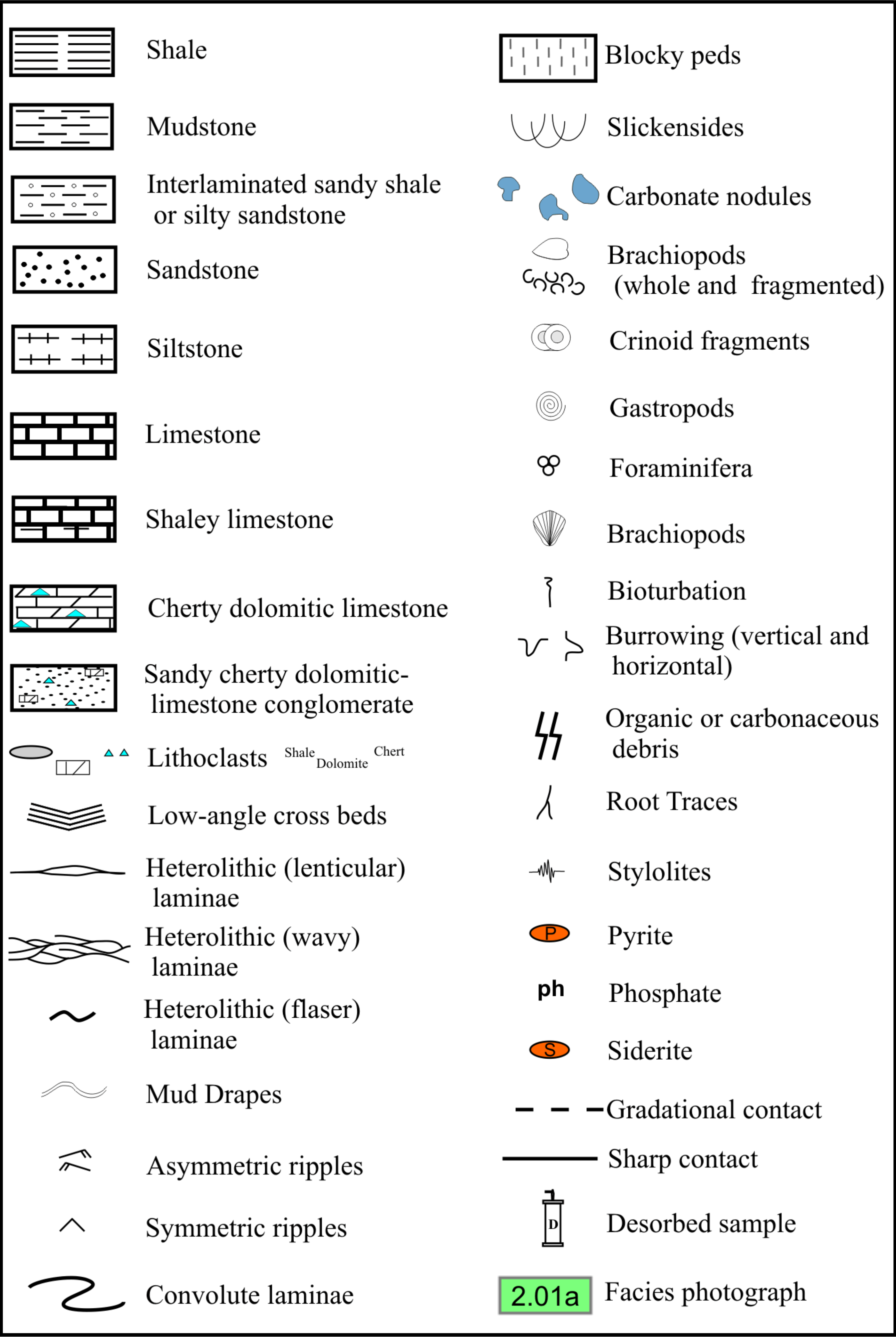
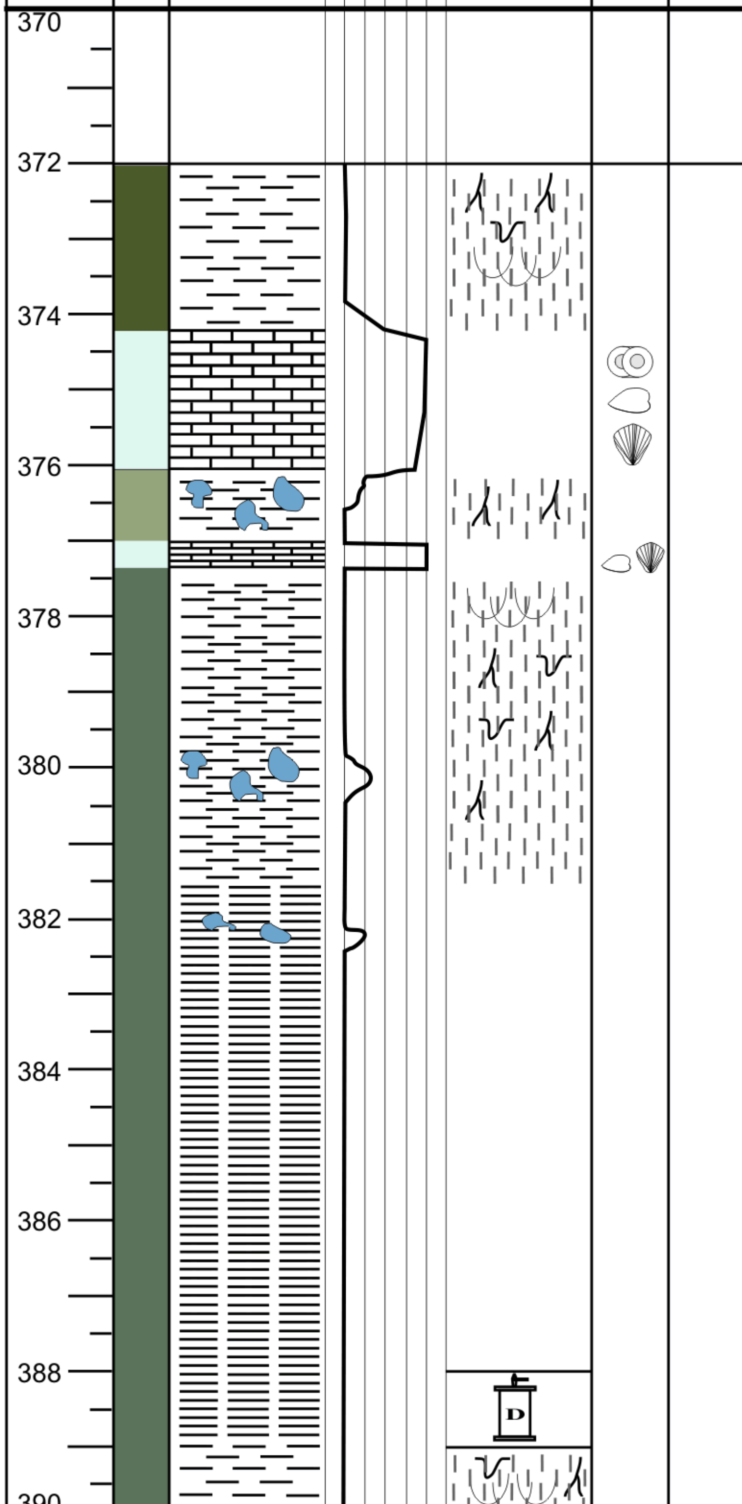

Shale
Mudstone
Interlaminated sandy shale or silty sandstone
Sandstone
Siltstone
Limestone
Shaley limestone
Cherty dolomitic limestone
Sandy cherty dolomitic-limestone conglomerate
Lithoclasts
Shale
Dolomite
Chert
Low-angle cross beds
Heterolithic (lenticular) laminae
Heterolithic (wavy) laminae
Heterolithic (flaser) laminae
Mud Drapes
Asymmetric ripples
Symmetric ripples
Convolute laminae
Blocky peds
Slickensides
Carbonate nodules
Brachiopods (whole and fragmented)
Crinoid fragments
Gastropods
Foraminifera
Brachiopods
Bioturbation
Burrowing (vertical and horizontal)
Organic or carbonaceous debris
Root Traces
Stylolites
P
Pyrite
ph
Phosphate
S
Siderite
Gradational contact
Sharp contact
D
Desorbed sample
2.01a
Facies photograph

WELL NAME Deffenbaugh Quarry #2	INTERVAL 370 - 390 ft	PAGE 1 OF 25
LOCATION S1-T12S-R23E, NW-SW-SE, Johnson Co., KS		BOXES 31-32
COMPANY Kansas Geological Survey	DESCRIBED BY W.M. Brown	DATE January 2005

DEPTH (feet)	COLOR	LITHOLOGY	CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST / CLASTICS: CLAY, SAND: Z, VF, F, M, C	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic



Organic rich, blocky non-laminated mudstone

BOX 31

Light gray packstone-grainstone. Both upper and lower contacts are gradational. Fossiliferous.

Light greenish-gray blocky mudstone with light bluish gray carbonate nodules.

Thin (0.5’) light gray bioclastic grainstone. 1-3 mm grains.

2.06

2.03c

Dark greenish gray mudstone gradual transition below to shale with slickenslides, burrows, and root casts.

Light bluish gray carbonate nodules.

BOX 32

Dark greenish-gray very finely laminated (<0.5 mm) shale.

Dark greenish gray blocky mudstone.

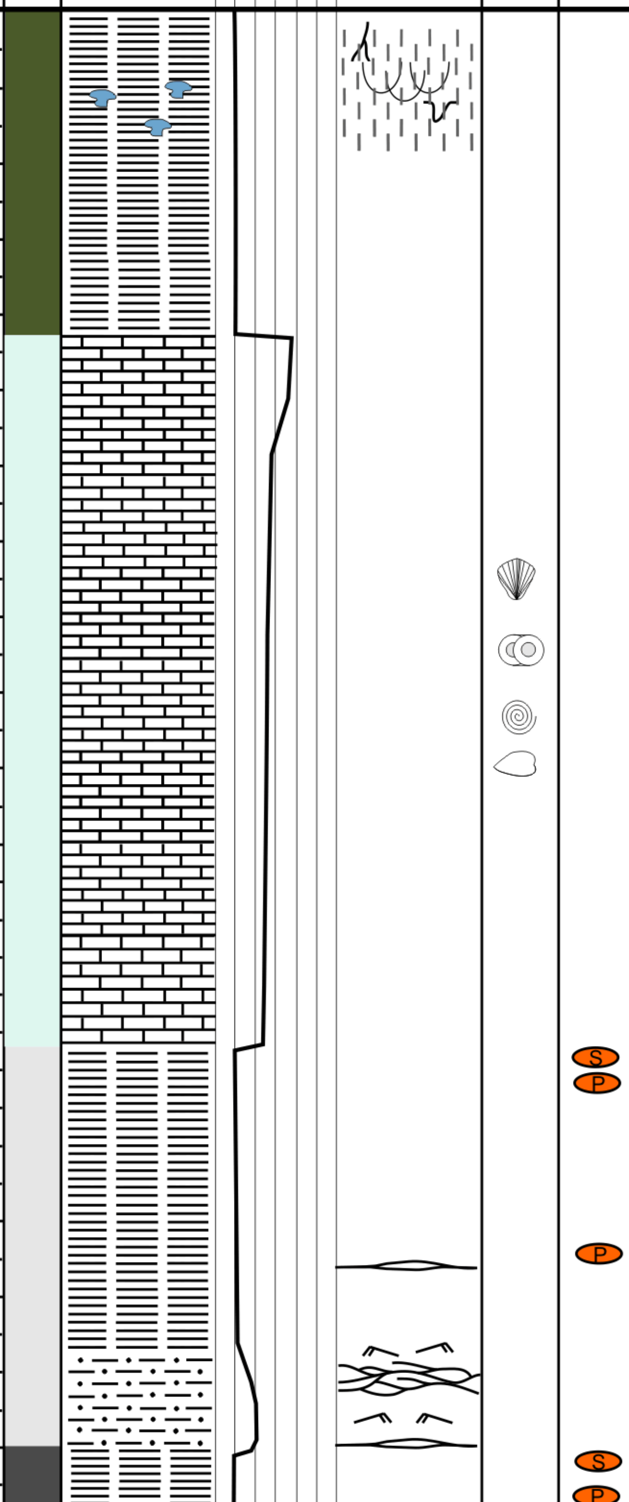
WELL NAME **Deffenbaugh Quarry #2**	INTERVAL **390 - 400 ft**	PAGE **2** OF **25**
LOCATION **S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**		BOXES **32-34**
COMPANY **Kansas Geological Survey**	DESCRIBED BY **W.M. Brown**	DATE **January 2005**

DEPTH (feet) | COLOR | LITHOLOGY | CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST | CLASTICS: CLAY, SAND: Z, VF, F, M, C | SEDIMENTARY STRUCTURES | FOSSILS | POST-DEPOSITIONAL / DIAGENETIC FEATURES

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic

SURFACES, FACIES, INTERVAL, and COMMENTS

BOX

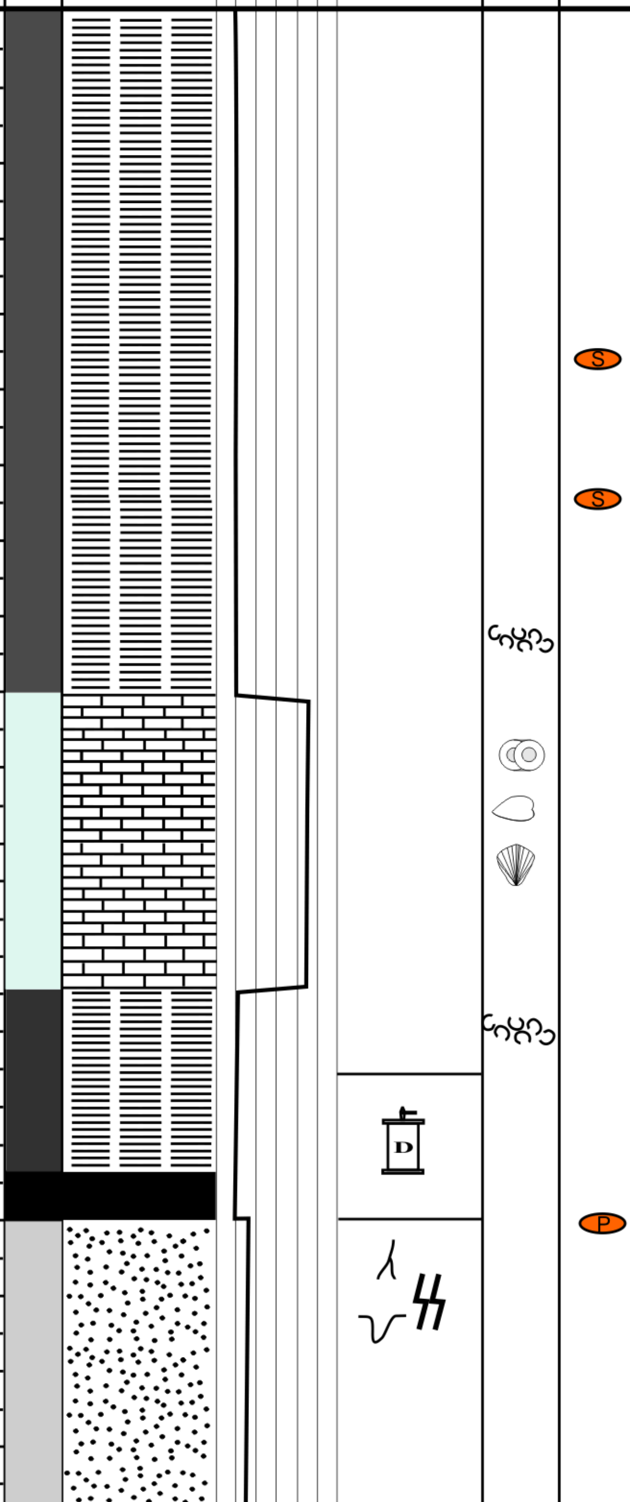


DEPTH (feet)	DESCRIPTION - NOTES	BOX
390	Dark greenish-gray mudstone with light bluish-gray carbonate nodules, slickenslides, root traces, and burrows. Disarticulated fossil fragments (brachiopods, pelecypods, crinoids, and gastropods).	
392		
394	Grain supported at top (packstone fabric).	
396	Light gray bioturbated wackestone to packstone. Mostly unabraided fossils.	33
398		
400		
402		
404	2.13a Dark-gray shale with pyrite and siderite.	
406		
408	Lenticular, wavy, and flaser bedded, ripple-cross laminated sandstone and shale. Very-fine grained. Pyrite mineralization.	34
410	Dark-gray shale with pyrite and siderite.	

WELL NAME **Deffenbaugh Quarry #2**	INTERVAL **410 - 430 ft**	PAGE **3** OF **25**
LOCATION **S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**		BOXES **34-35**
COMPANY **Kansas Geological Survey**	DESCRIBED BY **W.M. Brown**	DATE **January 2005**

DEPTH (feet)	COLOR	LITHOLOGY	CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST; CLASTICS: CLAY, SAND: Z, VF, F, M, C	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic



410

Dark gray to grayish black finely laminated shale. Siderite and pyrite common.

412

414

Siderite

416

418

10” dark-gray shale matrix with white to very light-gray abraided brachiopod and bivalve fossils.

Light-gray non-laminated carbonate packstone-grainstone. Disarticulated bivalves, crinoids, and brachiopods.

420 — BOX 35

422 — Top of the Fort Scott Limestone

Dark-gray to black, very finely laminated shale with occasional disarticulated bivalves.

Anna Shale, top of the Anna Interval

424

Lexington coal. Banded with alternating bright and dull bands, pyritized.

426

Light to medium light-gray structureless very fine-grained sandstone. Organic debris, coal partings, root casts, and burrows are common.

428

BOX 34

430

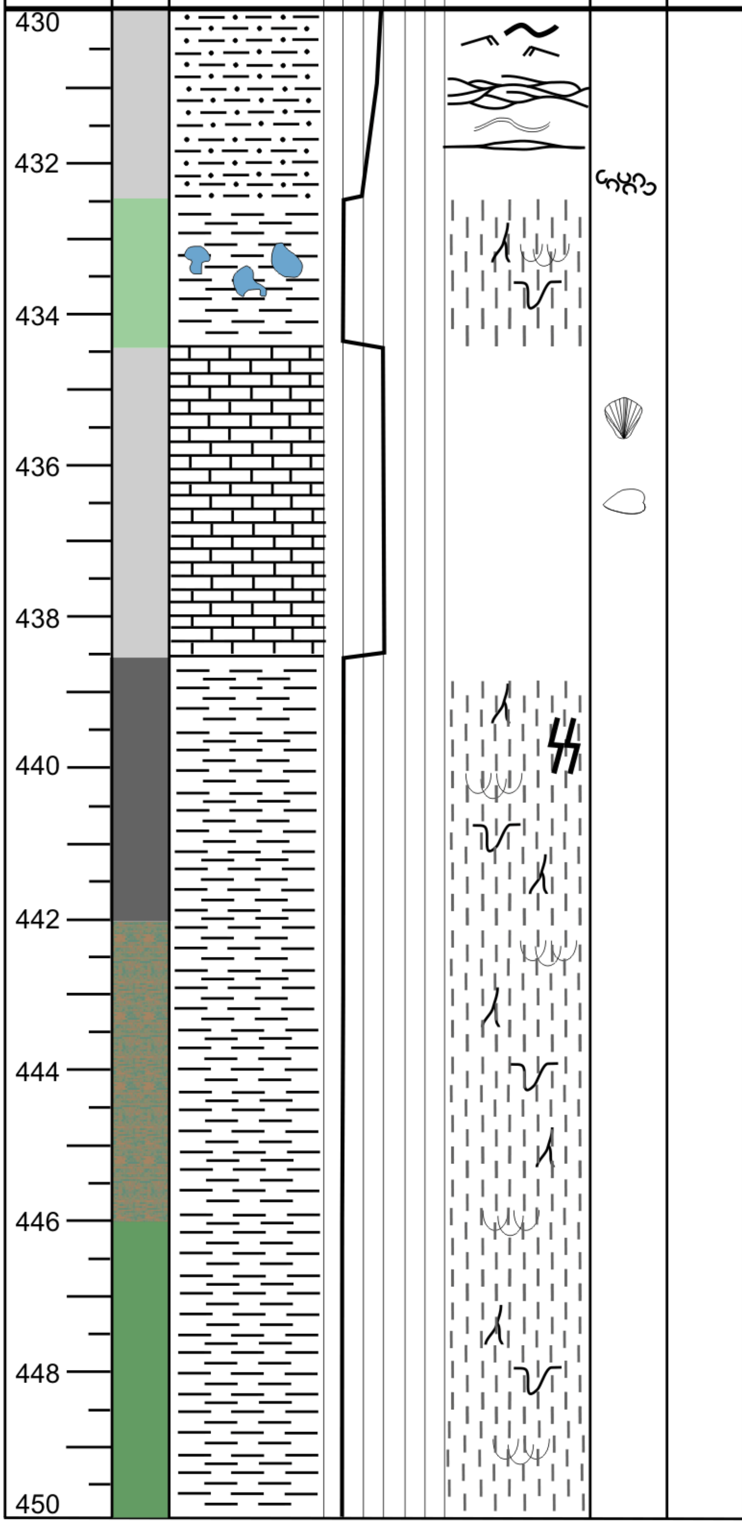
WELL NAME	**Deffenbaugh Quarry #2**	INTERVAL	**430 - 450 ft**	PAGE **4** OF **25**	
LOCATION	**S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**			BOXES	**35-37**
COMPANY	**Kansas Geological Survey**	DESCRIBED BY	**W.M. Brown**	DATE	**January 2005**

DEPTH (feet) | COLOR | LITHOLOGY | CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST; CLASTICS: CLAY, SAND: Z, VF, F, M, C | SEDIMENTARY STRUCTURES | FOSSILS | POST-DEPOSITIONAL / DIAGENETIC FEATURES

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic

SURFACES, FACIES, INTERVAL, and COMMENTS

BOX



Coarsening upwards, light-gray interlaminated shale and sandstone. Ripple-cross laminated, Lenticular, flaser and wavy bedding. Mud drapes.

Dark shell rich layer.

Light greenish gray blocky mudstone with occasional preserved relic laminae. Light bluish gray carbonate nodules, burrows, and root casts.

Slickenslidles.

Very light gray wackestone.

Unabraided brachiopod and bivalve fossils.

Organic rich, rooted and burrowed dark gray mudstone with slickenslides.

2-3 mm carbonaceous shale layers or coal laminae.

Reddish-brown and greenish-gray mottling. Weakly preserved laminae, slickenslides common.

2.03d

Dark greenish-gray blocky mudstone.

Higginsville Limestone

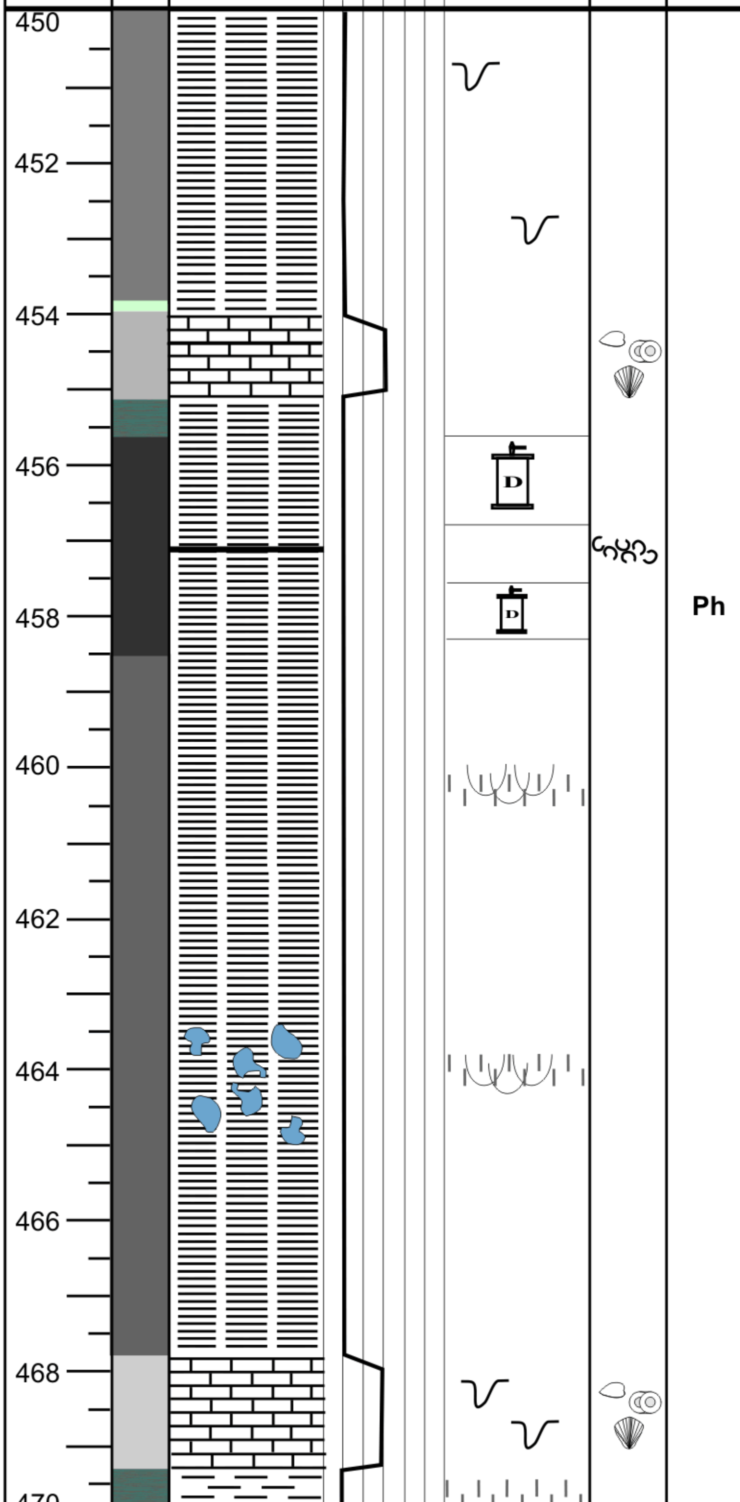
36

37

WELL NAME	**Deffenbaugh Quarry #2**	INTERVAL **450 - 470 ft**	PAGE **5** OF **25**
LOCATION	**S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**		BOXES **37-39**
COMPANY	**Kansas Geological Survey**	DESCRIBED BY **W.M. Brown**	DATE **January 2005**

DEPTH (feet)	COLOR	LITHOLOGY	CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST / CLASTICS: CLAY, SAND Z VF F M C	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic



Dark gray shale with poorly developed laminations, occasional burrows.

Medium gray wackestone. Unabraided crinoid stems, brachiopods, and bivalves.

Dark-gray and dark-greenish-gray mottled shale.
Dark-gray to black, very-finely laminated shale with abraided fossil fragments.

2.17a

Phosphate nodules in black shale. (LITTLE OSAGE shale)

Medium dark gray bioturbated shale occasional slickenslides and blocky textures.

Carbonate nodules in blocky peds and slickenslides.

2.05b

Medium-light-gray carbonate wackestone with unabraided crinoids, bivalves, and brachiopods. Mud rich. Bioturbated.
Dark-gray shale and green blocky mottled mudstone.

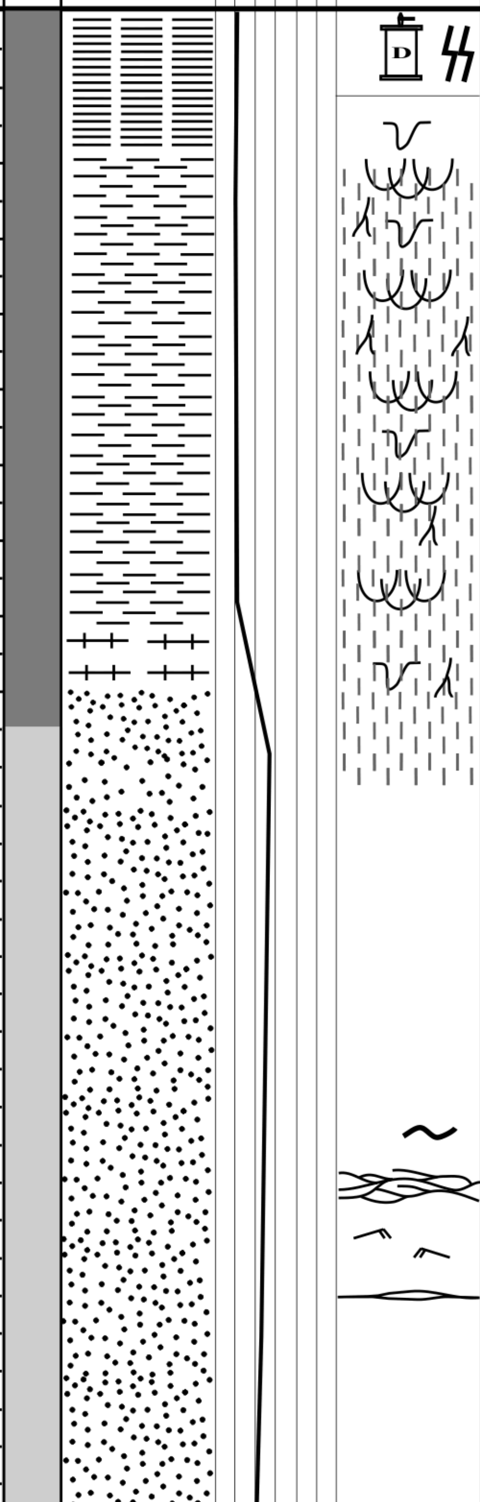
Little Osage Shale

Blackjack Creek limestone

Box: 38, 39

WELL NAME **Deffenbaugh Quarry #2**		INTERVAL **470 - 490 ft**	PAGE **6** OF **25**
LOCATION **S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**			BOXES **39-41**
COMPANY **Kansas Geological Survey**		DESCRIBED BY **W.M. Brown**	DATE **January 2005**

DEPTH (feet)	COLOR	LITHOLOGY	CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST / CLASTICS: CLAY, SAND (Z, VF, F, M, C)	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES (- Thickness - Color - Lithology (Grain Size, Sorting, Roundness) - Composition - Sedimentary Structures - Contacts - Body / Trace Fossils - Post-Depositional and Diagenetic)	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX

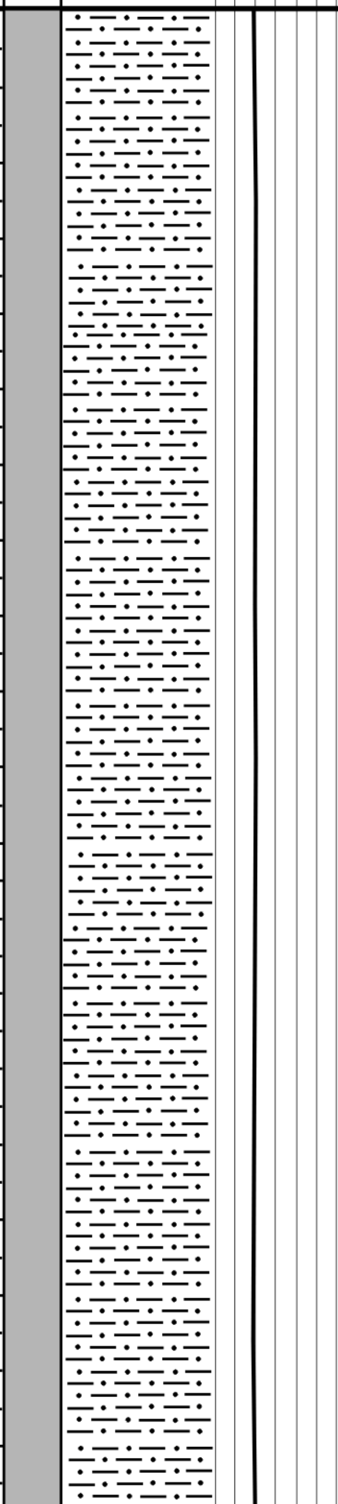


Depth (feet)	Post-Depositional / Diagenetic Features	Description - Notes	Surfaces, Facies, Interval, and Comments	Box
470	Ph	Phosphatic very finely laminated black shale	Excello Interval, Mulky Carbonaceous shale	
472–474		Medium gray blocky mudstone transitioning to sandstone at the base. Slickenslides and burrows prevalent.		
476				40
479		Gradational contact.		
480–482		Weak laminations of fine to very-fine sandstone. Slight coarsening upwards	Cattleman Sandstone	
484–485		Free oil and gas. Lenticular and wavy bedding, flasers and ripple-cross laminae common.		
490				41

Depth scale: 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490

WELL NAME **Deffenbaugh Quarry #2**	INTERVAL **490 - 510 ft**	PAGE **7** OF **25**
LOCATION **S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**		BOXES **41-42**
COMPANY **Kansas Geological Survey**	DESCRIBED BY **W.M. Brown**	DATE **January 2005**

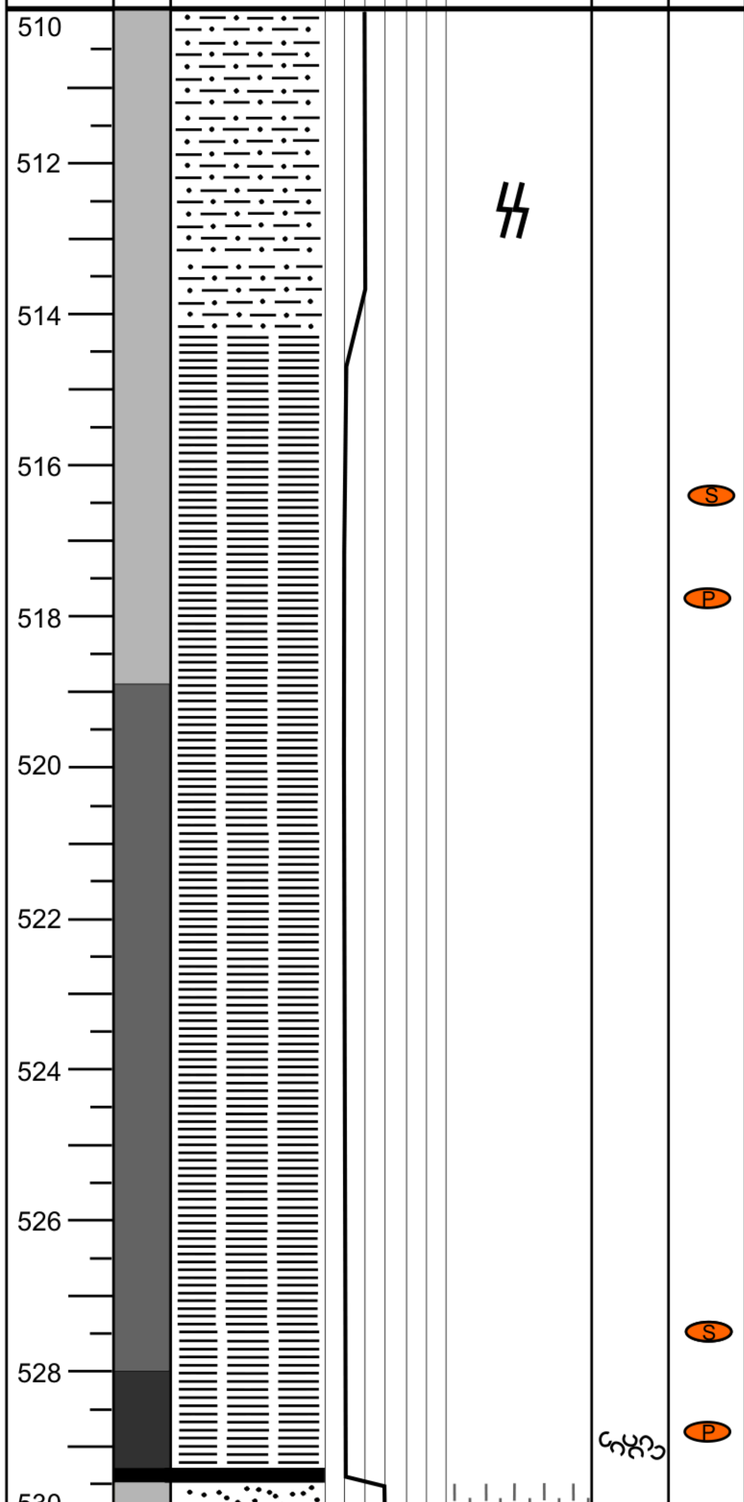
DEPTH (feet)	LITHOLOGY	CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST / CLASTICS: CLAY, Z, SAND: VF, F, M, C	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES - Thickness - Color - Lithology (Grain Size, Sorting, Roundness) - Composition - Sedimentary Structures - Contacts - Body / Trace Fossils - Post-Depositional and Diagenetic	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX
490						Medium-gray interlaminated sandy shale.		
					S			
492								
494								
496								
					S	Occasional thin beds (5-10 mm) of black shale.		
498								
500								
502								42
					S			
504						Occasional thin beds (1-20 mm) of Brown sideritic nodules.		
506								
508								
					S			
510								



WELL NAME **Deffenbaugh Quarry #2**	INTERVAL **510 - 530 ft**	PAGE **8** OF **25**	
LOCATION **S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**		BOXES **42-44**	
COMPANY **Kansas Geological Survey**	DESCRIBED BY **W.M. Brown**	DATE **January 2005**	

DEPTH (feet) | LITHOLOGY | CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST | CLASTICS: CLAY, SAND: Z, VF, F, M, C | SEDIMENTARY STRUCTURES | FOSSILS | POST-DEPOSITIONAL / DIAGENETIC FEATURES | DESCRIPTION - NOTES | SURFACES, FACIES, INTERVAL, and COMMENTS | BOX

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic



Medium gray, weakly laminated Siltstone.

Plant debris common.

Coarsens upwards, slightly.

2.17b

2.01a

Upper Iron Post Coal

BOX: 43, 44

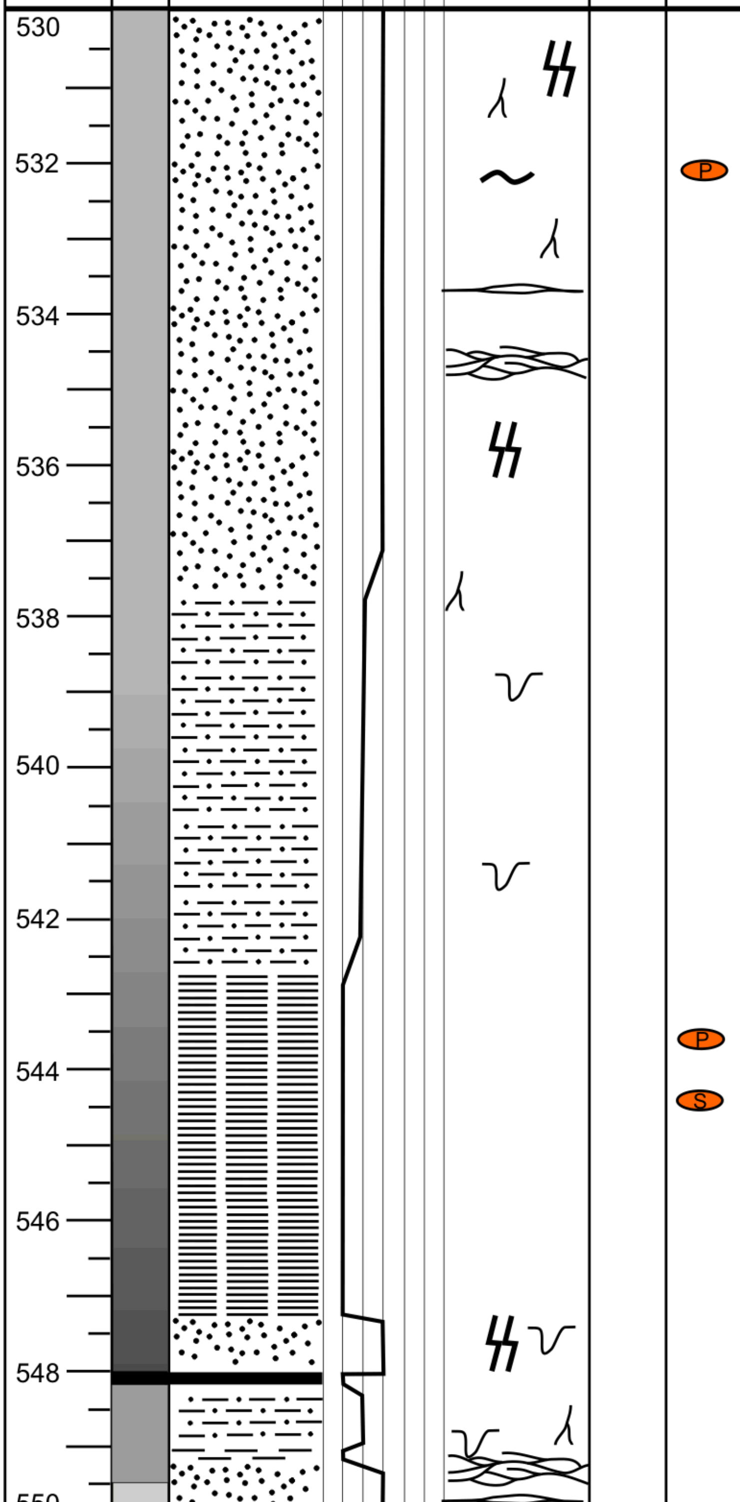
WELL NAME	Deffenbaugh Quarry #2	INTERVAL	530 - 550 ft
LOCATION	S1-T12S-R23E, NW-SW-SE, Johnson Co., KS	BOXES	44-46
COMPANY	Kansas Geological Survey	DESCRIBED BY	W.M. Brown
		DATE	January 2005

DEPTH (feet) | LITHOLOGY | CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST; CLASTICS: CLAY, SAND: Z, VF, F, M, C | SEDIMENTARY STRUCTURES | FOSSILS | POST-DEPOSITIONAL / DIAGENETIC FEATURES

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic

SURFACES, FACIES, INTERVAL, and COMMENTS

BOX



Coarsening upward very-fine-grained medium-gray sandstone. Wavy, flaser and lenticular bedding in ripple-cross laminae.

Micaceous and rich in organic debris.

2.08a

Burrows.

Pyrite

Squirrel Sandstone

43

Medium- gray interlaminated sand, silt, and shale.

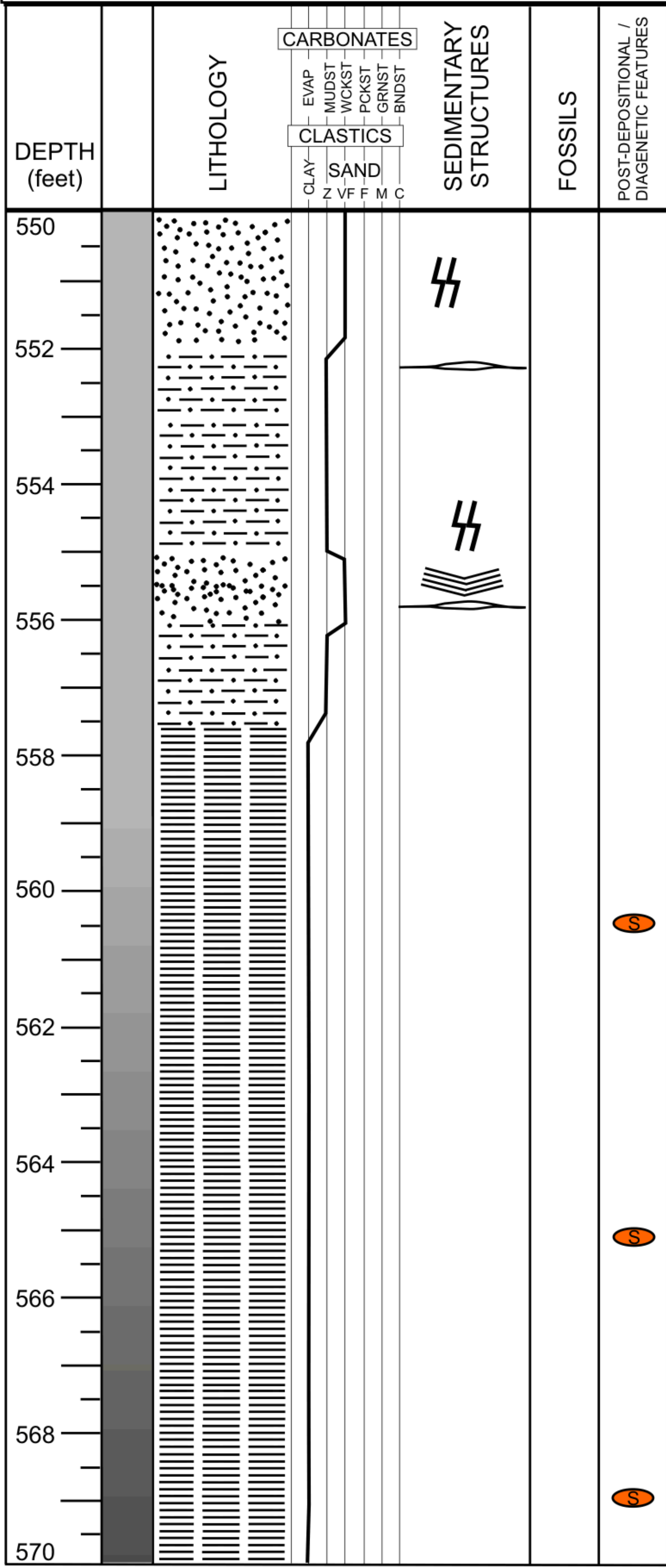
Dark-gray pyrite and siderite rich shale.

44

Medium-gray sandstone with burrows and organic material.
4” coal.
Light to medium-gray sand, shale, and silt, interlaminated with lenticular and wavy beds.

Lower Iron Post Coal

WELL NAME	**Deffenbaugh Quarry #2**	INTERVAL	**550 - 570 ft**	PAGE **10** OF **25**
LOCATION	**S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**			BOXES **46-47**
COMPANY	**Kansas Geological Survey**	DESCRIBED BY	**W.M. Brown**	DATE **January 2005**



DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic

SURFACES, FACIES, INTERVAL, and COMMENTS

BOX

Coarsening-upwards medium-gray fine-grained sandstone.

Plant debris and other organics.

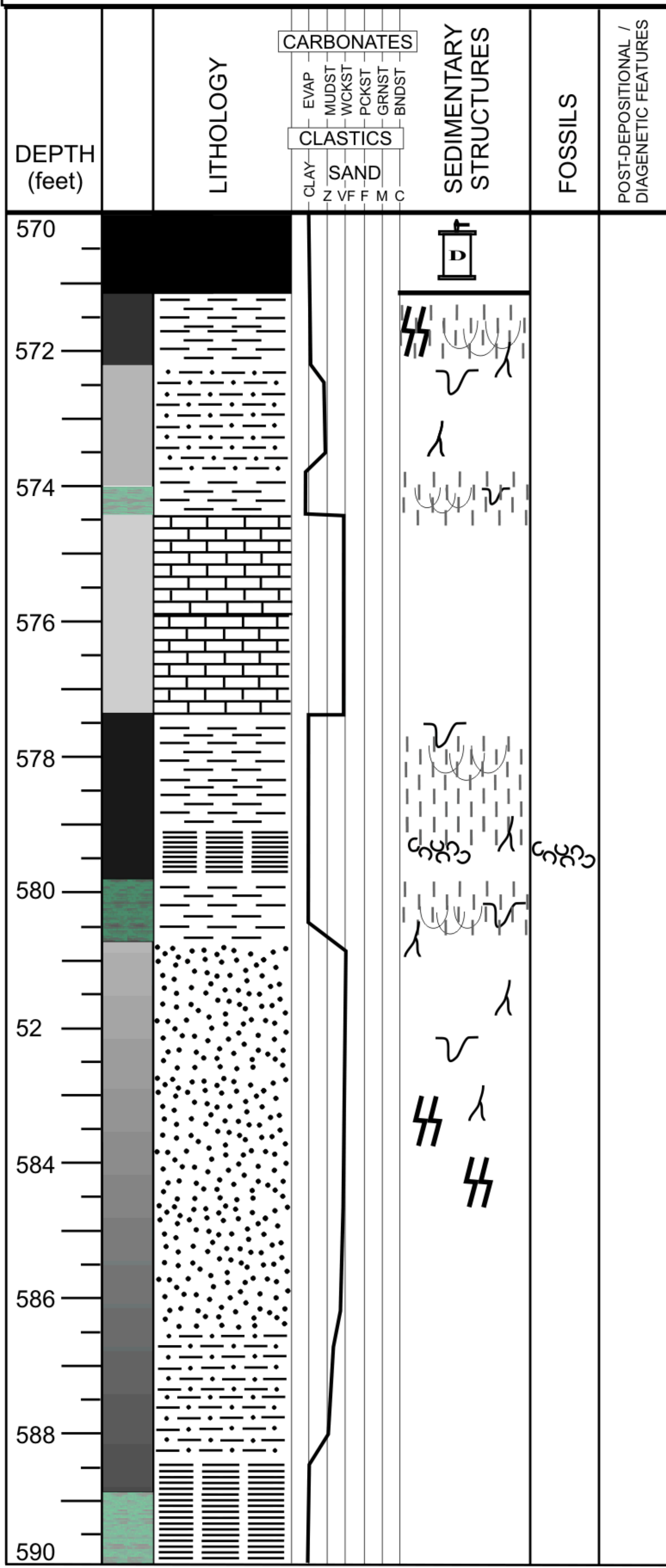
Laminated and lenticular medium-gray sandy shale.

Low-angle cross-bedded lenticular and laminated medium-gray, fine-grained sandstone.

Sideritic dark-gray shale.

47

WELL NAME **Deffenbaugh Quarry #2**	INTERVAL **570 - 590 ft**		PAGE **11** OF **25**
LOCATION **S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**			BOXES **47-49**
COMPANY **Kansas Geological Survey**	DESCRIBED BY **W.M. Brown**		DATE **January 2005**



DESCRIPTION - NOTES

- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic

SURFACES, FACIES, INTERVAL, and COMMENTS

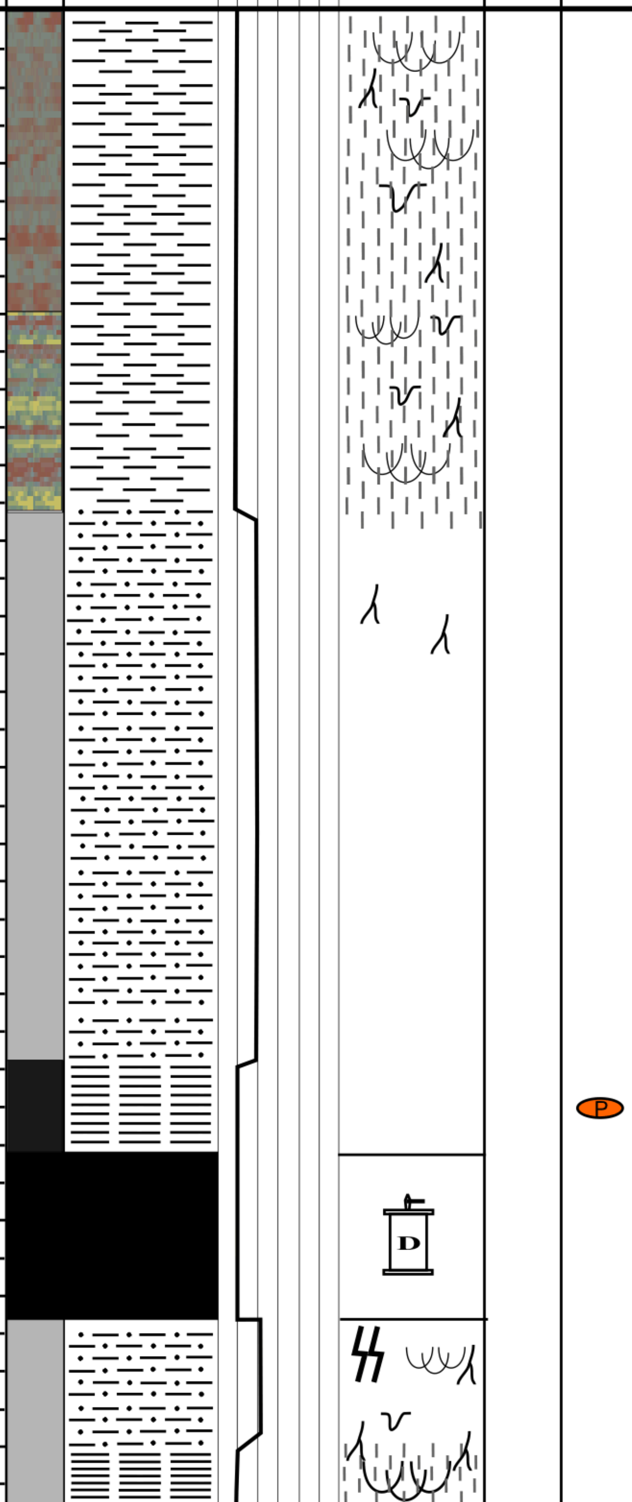
BOX

DESCRIPTION - NOTES	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX
Bevier Coal from 570'-571'-4"	Bevier coal	48
Mottled and blocky mudstone. Dark gray in color, and rich in organics. Silt content increases with depth. Roots, burrows, and slickenslides common.		
Greenish-gray blocky mudstone.		
Very light-gray wackestone. Articulated brachiopod and pelecypod fossils.	Verdigris Limestone	
Dark-gray blocky mudstone with burrows, slickenslides, and root traces. Black shale with disarticulated pelecypod and brachiopod fragments.	V-Shale, top of V-Shale interval	
Greenish-gray blocky mudstone.		
Coarsening upwards, medium-gray, structureless, very fine-grained sandstone. Organic material, root traces, and burrows are common throughout.		49
Transitional contacts below to greenish-gray shale.		

WELL NAME **Deffenbaugh Quarry #2**		INTERVAL **590 - 610 ft**	PAGE **12** OF **25**
LOCATION **S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**			BOXES **49-51**
COMPANY **Kansas Geological Survey**		DESCRIBED BY **W.M. Brown**	DATE **January 2005**

DEPTH (feet)	LITHOLOGY	CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST / CLASTICS: CLAY, Z, SAND VF F M C	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic



590
592
594
596
598
600
602
604
606
608
610

Brownish-red and greenish-gray blocky mottled mudstone.

Slickenslides, burrows, and root traces

2.03e

Pale yellowish-gray, greenish-gray, and reddish-brown mottled blocky mudstone.

2.03a

Weakly laminated medium-gray sandy shale.

Pyritic finely laminated black shale

2.15

Fleming coal @ 605'-607'-3"

Organic rich, coarsening-upwards, siltstone. Root traces, slickenslides, and burrows common.

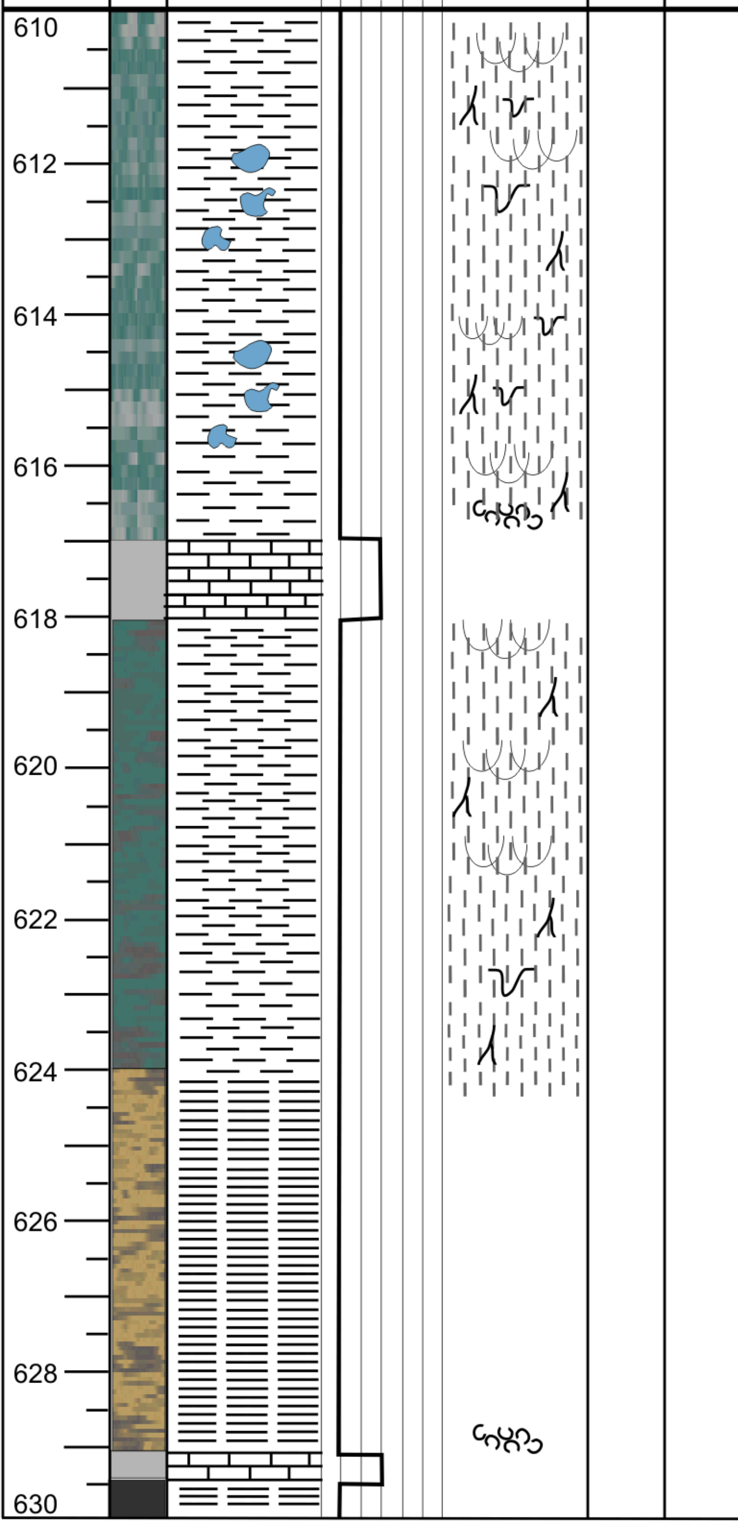
Blocky medium-gray mudstone.

SURFACES, FACIES, INTERVAL, and COMMENTS: Fleming coal

BOX: 50, 51

WELL NAME	Deffenbaugh Quarry #2	INTERVAL 610 - 630 ft	PAGE 13 OF 25
LOCATION	S1-T12S-R23E, NW-SW-SE, Johnson Co., KS		BOXES 51-53
COMPANY	Kansas Geological Survey	DESCRIBED BY W.M. Brown	DATE January 2005

DEPTH (feet) | LITHOLOGY | CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST; CLASTICS: CLAY, SAND: Z, VF, F, M, C | SEDIMENTARY STRUCTURES | FOSSILS | POST-DEPOSITIONAL / DIAGENETIC FEATURES



DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic

Medium dark-gray and greenish-gray blocky mudstone.

Slickenslides, burrows, and root traces

Light bluish-gray nodular carbonate.

Disarticulated fossils in dark-gray shale.
Very light-gray muddy wackestone. Crinoids, brachiopods, and bivalve fossils preserved.

Dark greenish-gray, and medium dark-gray blocky mudstone.

Yellowish and reddish mottled.

Dark-gray shale with yellow and red mottles but no slickenslides or roots.

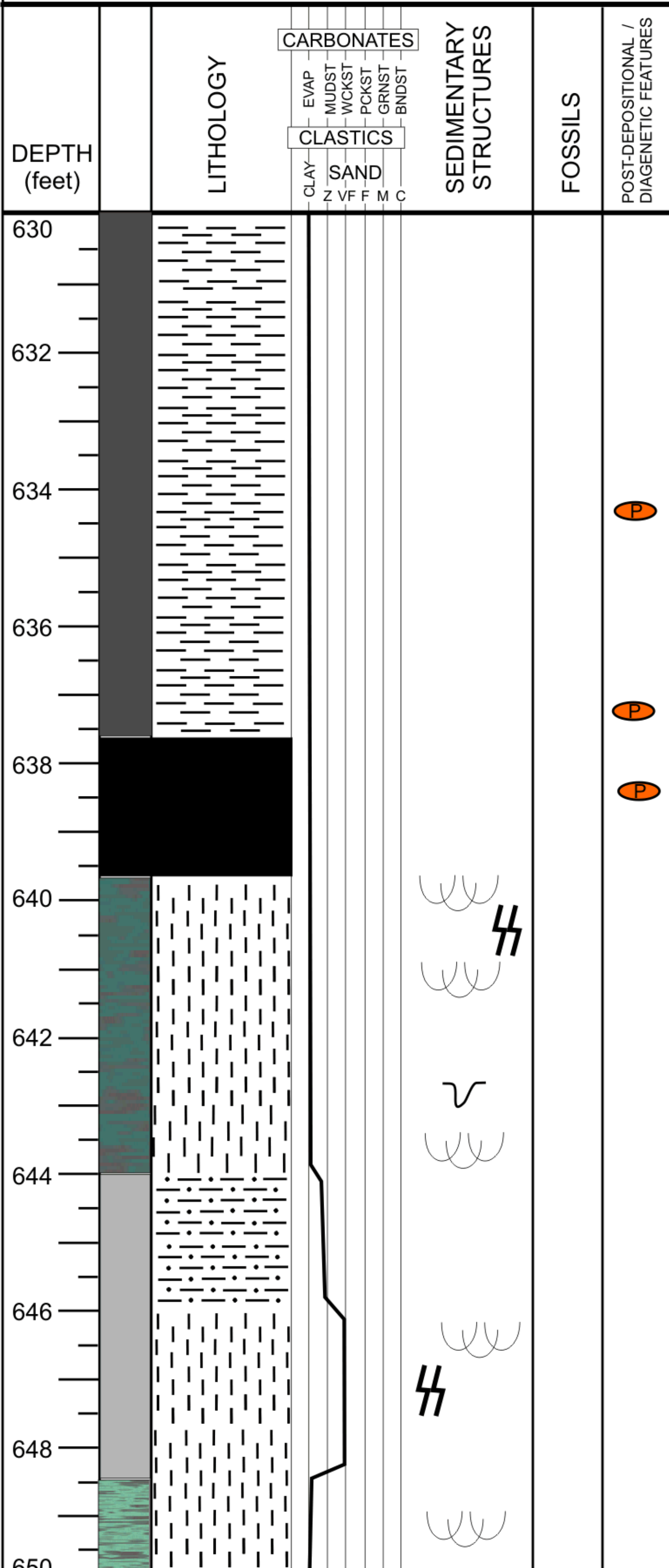
Disarticulated fossils in dark-gray shale.

Very light-gray wackestone.
Dark-gray shale

SURFACES, FACIES, INTERVAL, and COMMENTS

BOX
52
53

WELL NAME	**Deffenbaugh Quarry #2**	INTERVAL	**630 - 650 ft**	PAGE	**14** OF **25**
LOCATION	**S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**			BOXES	**53-54**
COMPANY	**Kansas Geological Survey**	DESCRIBED BY	**W.M. Brown**	DATE	**January 2005**



DESCRIPTION - NOTES

- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic

SURFACES, FACIES, INTERVAL, and COMMENTS | **BOX**

Dark-gray shale.
Faint laminations, poorly developed

Pyrite

2.13b

Mineral Coal, 637'-8" to 639'-4".
Substantial pyrite.

2.01e

Mineral coal

Dark-gray and greenish-gray blocky mudstone.

Organic rich

54

Slickenslides

Fining-upwards medium-gray siltstone

Medium-gray fining-upwards blocky
Very fine-grained sandstone.
Organic rich.

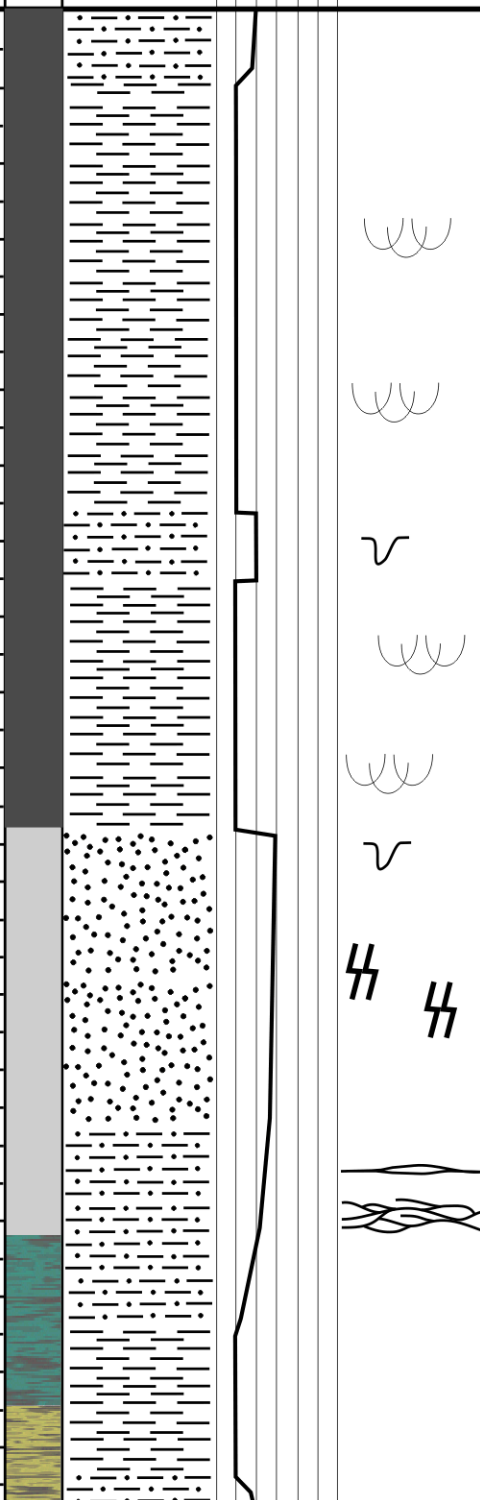
Light greenish-gray blocky mudstone.
Slickenslides and root traces.

53

WELL NAME **Deffenbaugh Quarry #2**	INTERVAL **650 - 670 ft**	PAGE **15** OF **25**
LOCATION **S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**		BOXES **54-56**
COMPANY **Kansas Geological Survey**	DESCRIBED BY **W.M. Brown**	DATE **January 2005**

DEPTH (feet)	LITHOLOGY	CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST / CLASTICS: CLAY, Z, SAND: VF, F, M, C	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic



650

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670

Poorly laminated medium-gray, silty shale.

Burrowed and rooted non-laminated siltstone.

Coarsening upwards, very light-gray, Very fine-grained, sandstone. No laminations, organic rich.

Lenticular silty-sandy-shale. Heterolithic.

Pale-yellowish mottles in dark greenish-gray and dark-gray shale.

Occasional root traces.

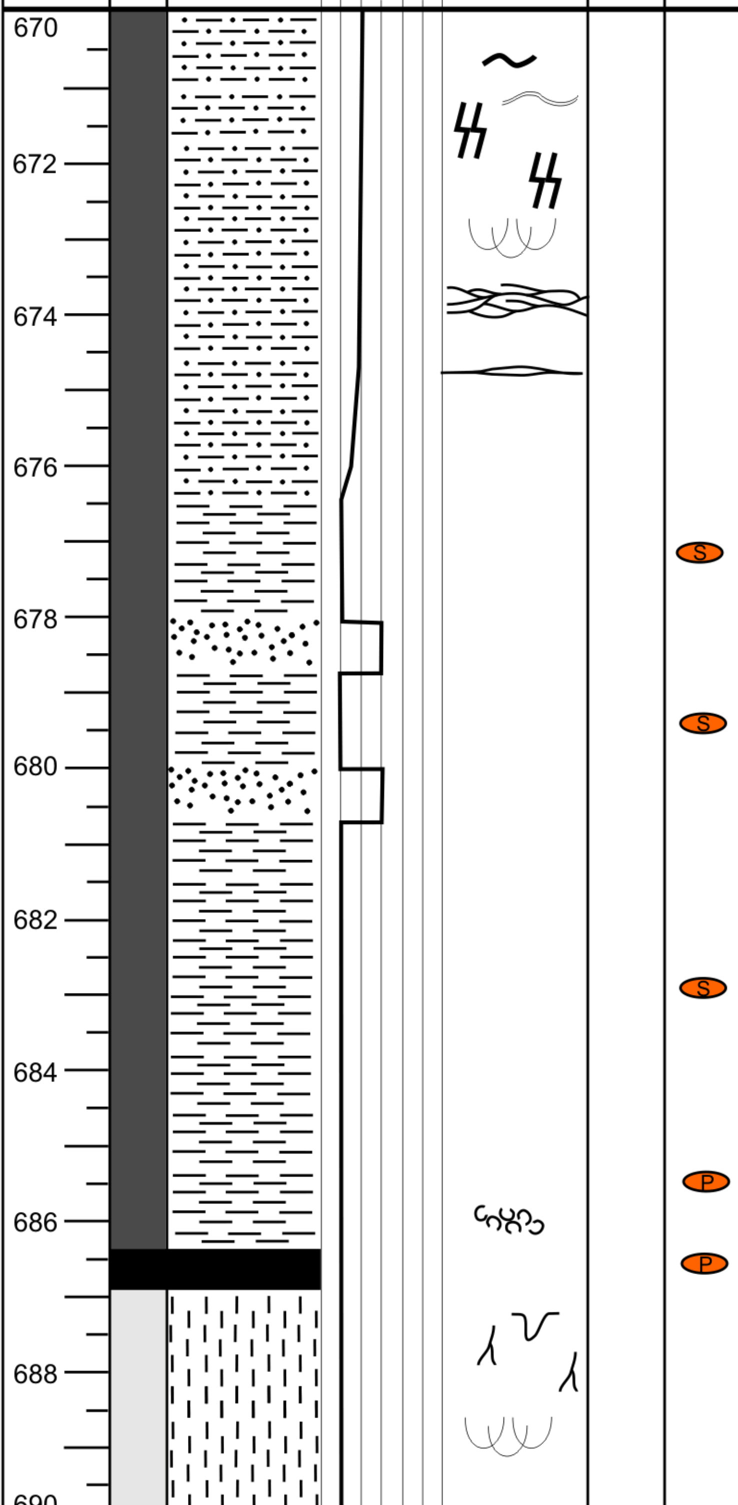
Laminated and burrowed siltstone.

BOX: 54, 53

WELL NAME **Deffenbaugh Quarry #2**		INTERVAL **670 - 690 ft**	PAGE **16** OF **25**
LOCATION **S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**			BOXES **56-58**
COMPANY **Kansas Geological Survey**		DESCRIBED BY **W.M. Brown**	DATE **January 2005**

DEPTH (feet)	LITHOLOGY	CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST / CLASTICS: CLAY, SAND: Z, VF, F, M, C	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic



Medium to dark-gray finely laminated And lenticular siltstone. Organic rich, With occasional slickenslides, Flaser beds, and mud drapes.

<1’ very fine-grained sandstone beds.

Disarticulated fossil bed in dark gray Shale. Pyrite.

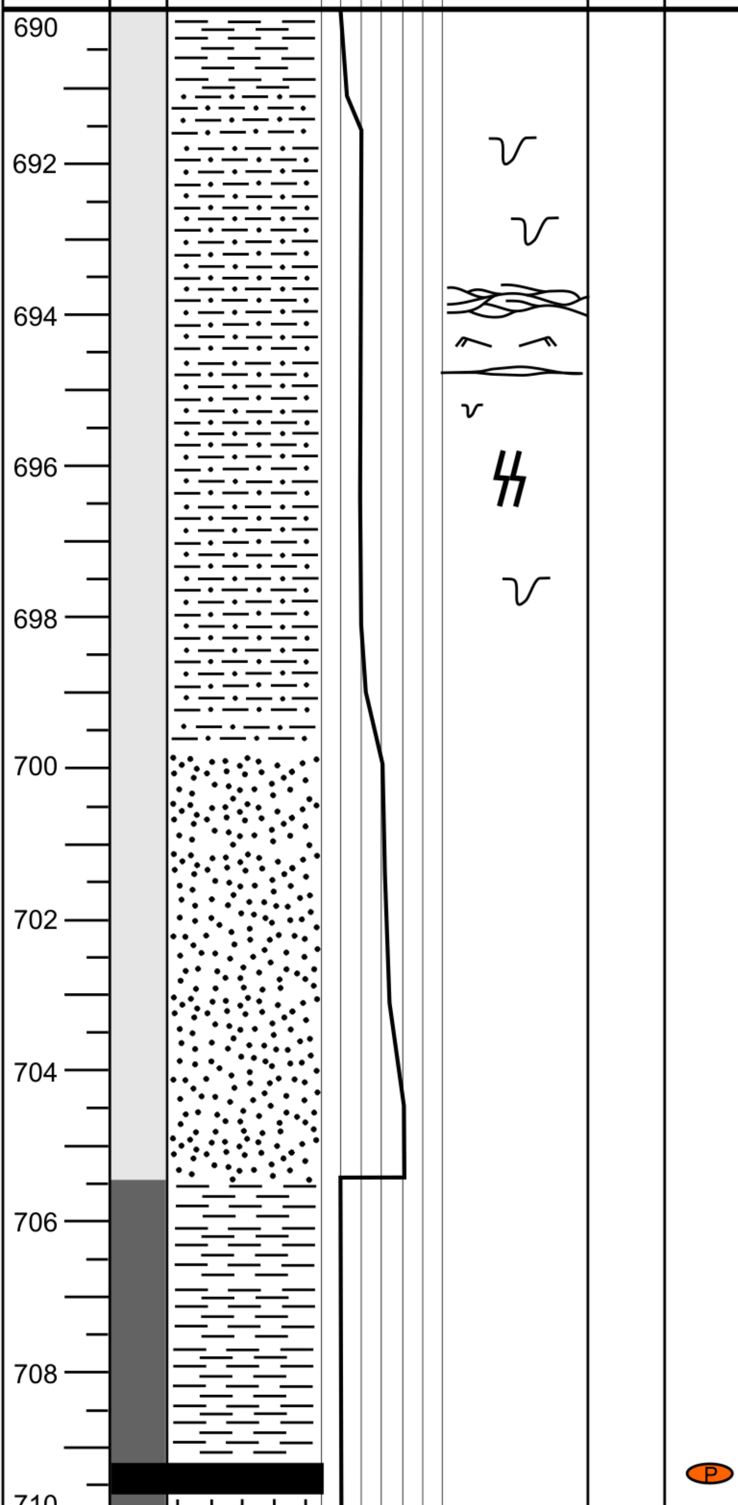
Coal with calcite filled cleats.

Light-gray blocky mudstone.

BOX: 57, 58

WELL NAME	**Deffenbaugh Quarry #2**	INTERVAL **690 - 710 ft**	PAGE **17** OF **25**
LOCATION	**S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**		BOXES **58-59**
COMPANY	**Kansas Geological Survey**	DESCRIBED BY **W.M. Brown**	DATE **January 2005**

DEPTH (feet)	LITHOLOGY	CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST / CLASTICS: CLAY, SAND: Z, VF, F, M, C	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES (- Thickness - Color - Lithology (Grain Size, Sorting, Roundness) - Composition - Sedimentary Structures - Contacts - Body / Trace Fossils - Post-Depositional and Diagenetic)	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX



Fining-upwards, light-gray laminated shaley siltstone.

Thin (3-4 mm) sandy laminae.

Lenticular ripple-cross laminated.

Laminations, organic material, and burrows.

Medium light-gray micaceous fine-grained sandstone.

Occasional mud drapes and flasers.

Sharp contact of medium-grained micaceous sandstone with underlying dark-gray very finely-laminated shale.

Brightly banded coal with pyrite and Calcite mineralization.

BOX: 59

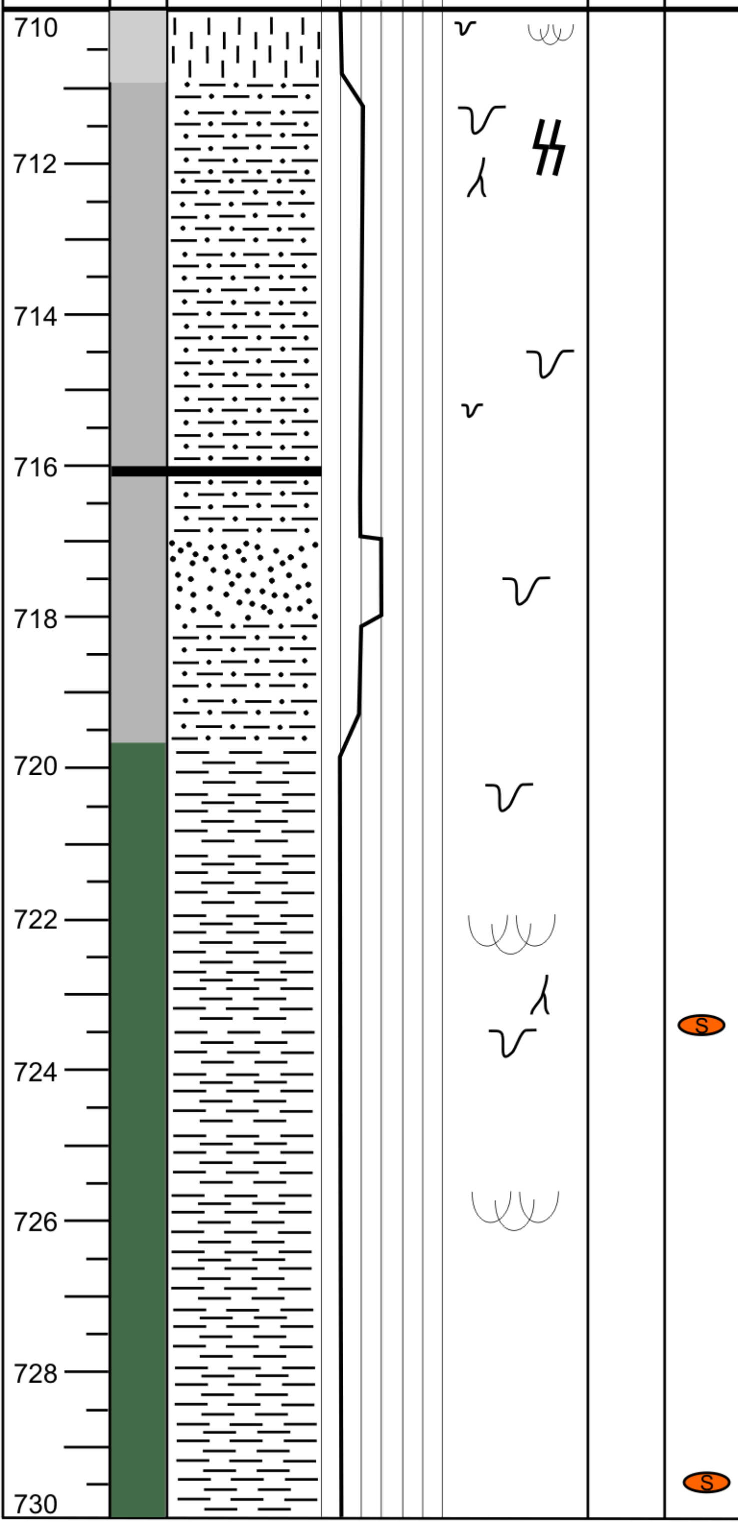
WELL NAME	Deffenbaugh Quarry #2	INTERVAL 710 - 730 ft	PAGE 18 OF 25
LOCATION	S1-T12S-R23E, NW-SW-SE, Johnson Co., KS		BOXES 59-61
COMPANY	Kansas Geological Survey	DESCRIBED BY W.M. Brown	DATE January 2005

DEPTH (feet) | LITHOLOGY | CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST | CLASTICS: CLAY, SAND: Z, VF, F, M, C | SEDIMENTARY STRUCTURES | FOSSILS | POST-DEPOSITIONAL / DIAGENETIC FEATURES

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic

SURFACES, FACIES, INTERVAL, and COMMENTS

BOX



Light-gray blocky mudstone.

Medium light-gray laminated siltstone

3” coal, bright bands. Calcite and pyrite mineralization in cleats.

1’ very fine grained sandstone bed. Mud drapes.

Dark greenish-gray and dark-gray sideritic shale.

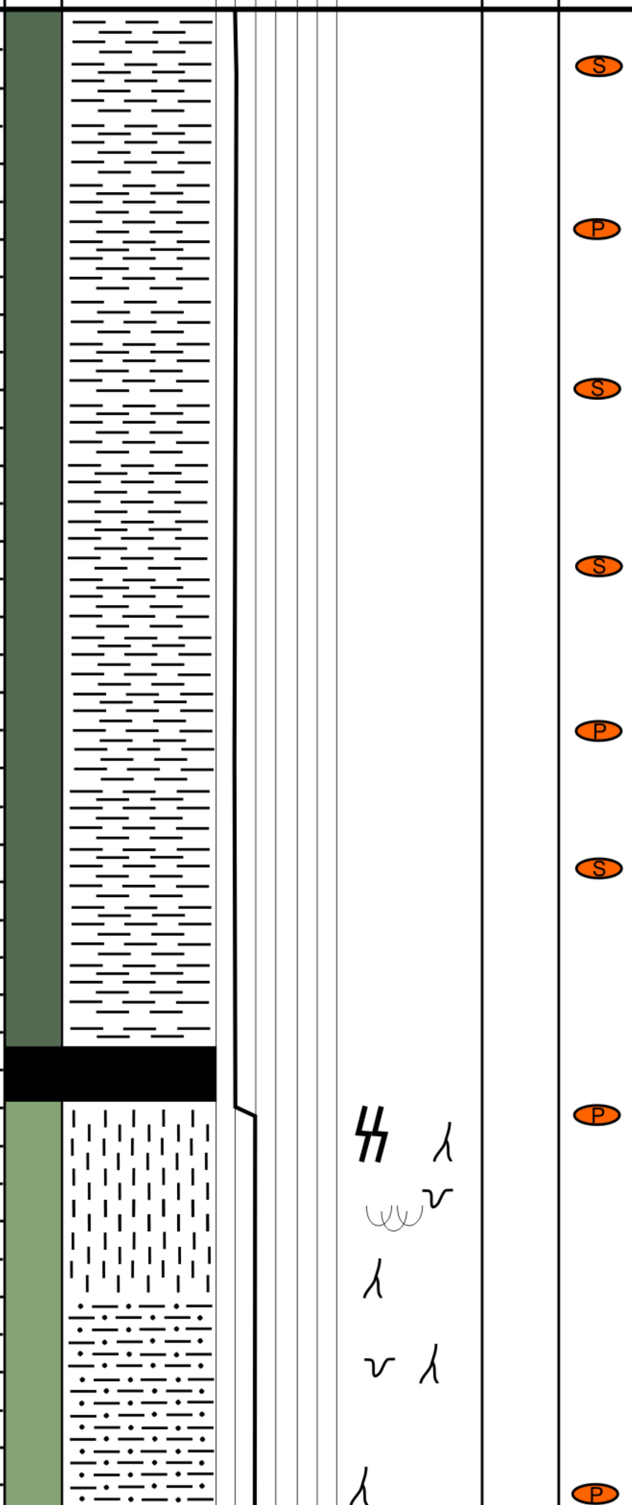
Occasional mottles.

60

61

WELL NAME	Deffenbaugh Quarry #2	INTERVAL 730 - 750 ft	PAGE 19 OF 25
LOCATION	S1-T12S-R23E, NW-SW-SE, Johnson Co., KS		BOXES 61-63
COMPANY	Kansas Geological Survey	DESCRIBED BY W.M. Brown	DATE January 2005

DEPTH (feet)	LITHOLOGY	CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST / CLASTICS: CLAY, SAND: Z, VF, F, M, C	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES (- Thickness - Color - Lithology (Grain Size, Sorting, Roundness) - Composition - Sedimentary Structures - Contacts - Body / Trace Fossils - Post-Depositional and Diagenetic)	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX



Depth marks: 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 740

Box: 61 (from 732), 62 (from 744.5)

Dark greenish-gray to medium dark-gray sideritic and pyritic shale.

Siderite is typically banded (1-3 cm in thickness) and pyrite is usually nodular (0.5-1 cm in diameter)

Dull coal with calcite and pyrite mineralization in cleats.

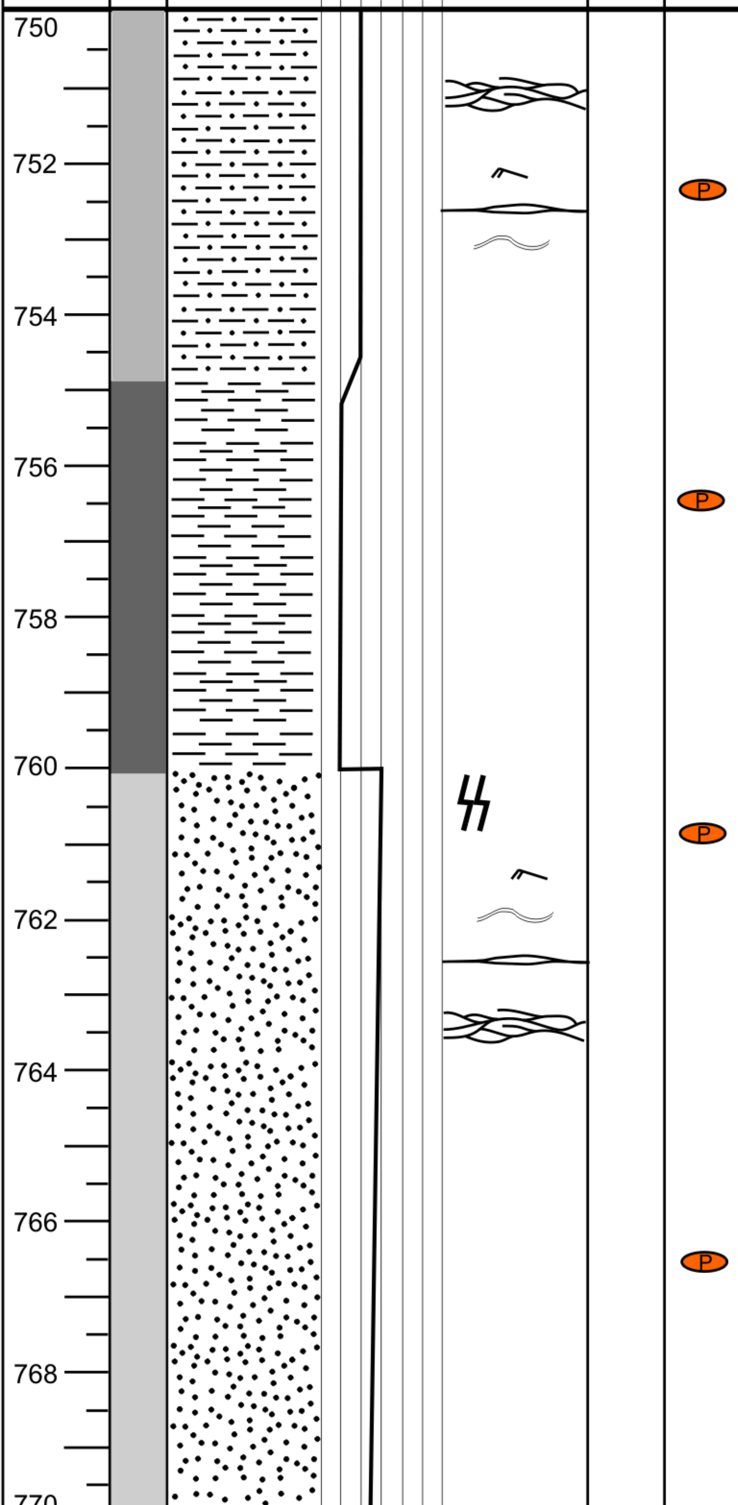
Organic debris and 2mm coal stringers.

Laminated below 746'-6".

Pyrite mineralization in laminated greenish-gray siltsone with dark gray Shale.

WELL NAME	Deffenbaugh Quarry #2	INTERVAL 750 - 770 ft	PAGE 20 OF 25
LOCATION	S1-T12S-R23E, NW-SW-SE, Johnson Co., KS		BOXES 63-64
COMPANY	Kansas Geological Survey	DESCRIBED BY W.M. Brown	DATE January 2005

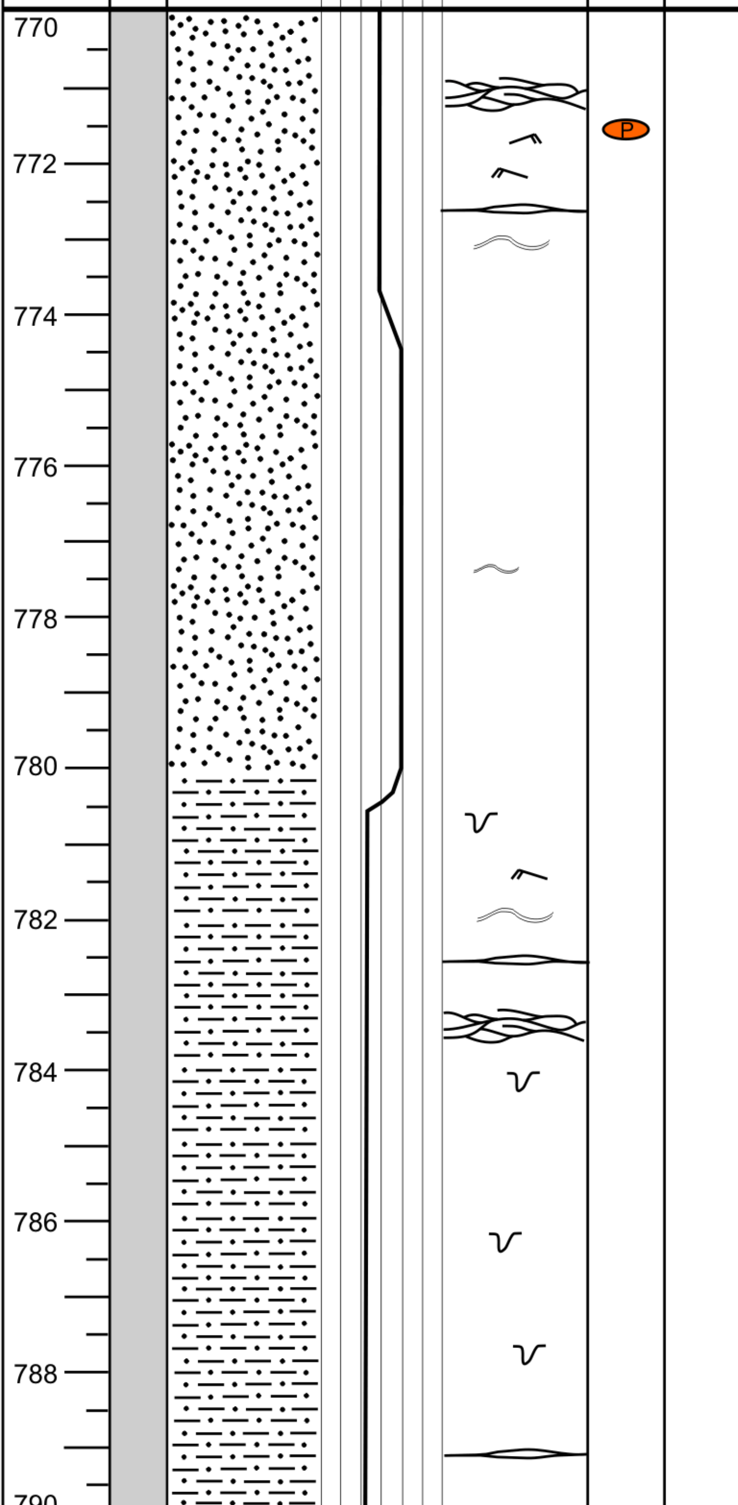
DEPTH (feet)		LITHOLOGY / CARBONATES (EVAP, MUDST, WCKST, PCKST, GRNST, BNDST) / CLASTICS (CLAY, SAND: Z, VF, F, M, C)	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES (- Thickness - Color - Lithology (Grain Size, Sorting, Roundness) - Composition - Sedimentary Structures - Contacts - Body / Trace Fossils - Post-Depositional and Diagenetic)	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX
750–760					P	Lenticular and wavy bedded ripple-cross laminated sandy shale. Pyrite. Mud drapes. Transitional contact. Sharp contact. Organic debris, pyrite.		
760–770					P	Heterolithic with mud drapes, lenticular and wavy bedding. Micaceous very fine-grained sandstone. 2.11c Slight coarsening-upwards profile, more and thicker mud laminae.		64



WELL NAME	**Deffenbaugh Quarry #2**	INTERVAL **770 - 790 ft**	PAGE **21** OF **25**
LOCATION	**S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**		BOXES **64-66**
COMPANY	**Kansas Geological Survey**	DESCRIBED BY **W.M. Brown**	DATE **January 2005**

DEPTH (feet)		LITHOLOGY	CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST / CLASTICS: CLAY, SAND: Z, VF, F, M, C	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic



Lenticular and wavy bedded ripple-cross laminated sandy shale. Pyrite.

Mud drapes.

Transitional contact.

Very thin muddy drapes and occcasional flaser beds.

.

Transitional contact.

Heterolithic interlaminated shale and sandstone.

Bi-directional current ripples, mud drapes and double mud drapes, flaser and wavy bedding.

Dark-gray shale laminae interlaminated with very light-gray sand laminae.

BOX: 65, 66

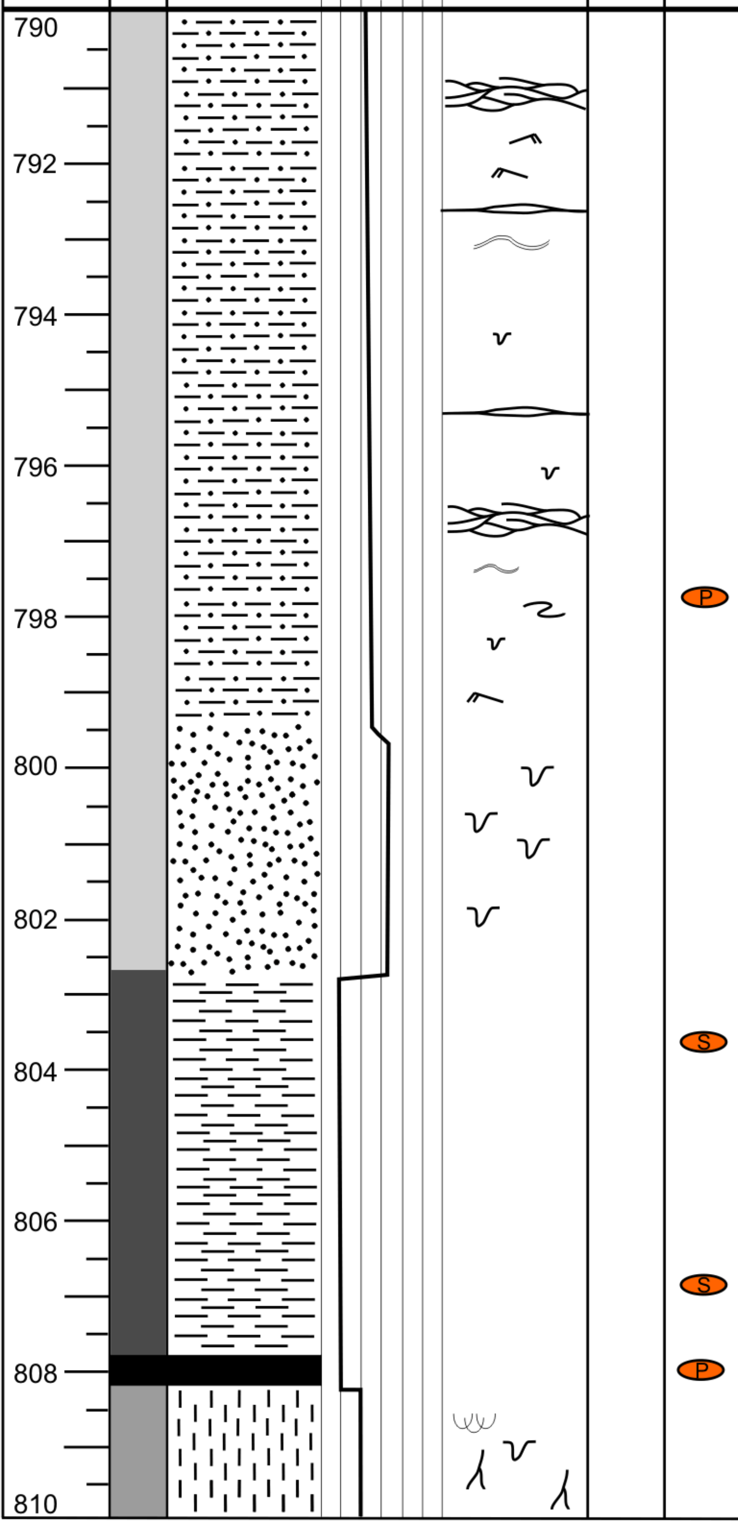
WELL NAME	Deffenbaugh Quarry #2	INTERVAL 790 - 810 ft	PAGE 22 OF 25
LOCATION	S1-T12S-R23E, NW-SW-SE, Johnson Co., KS		BOXES 66-68
COMPANY	Kansas Geological Survey	DESCRIBED BY W.M. Brown	DATE January 2005

DEPTH (feet) | LITHOLOGY | CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST; CLASTICS: CLAY, SAND: Z, VF, F, M, C | SEDIMENTARY STRUCTURES | FOSSILS | POST-DEPOSITIONAL / DIAGENETIC FEATURES

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic

SURFACES, FACIES, INTERVAL, and COMMENTS

BOX



Lenticular and wavy bedded ripple-cross laminated sandy shale.

2.11f

Mud drapes.

Bi-directional current ripples.

Burrows

Convolute laminae.

Soft sediment deformation (?)

.

Dark-gray very-fine to fine grained burrowed sandstone.

Dark-gray sideritic shale.

Pyritic bright coal.

Medium gray blocky mudstone.

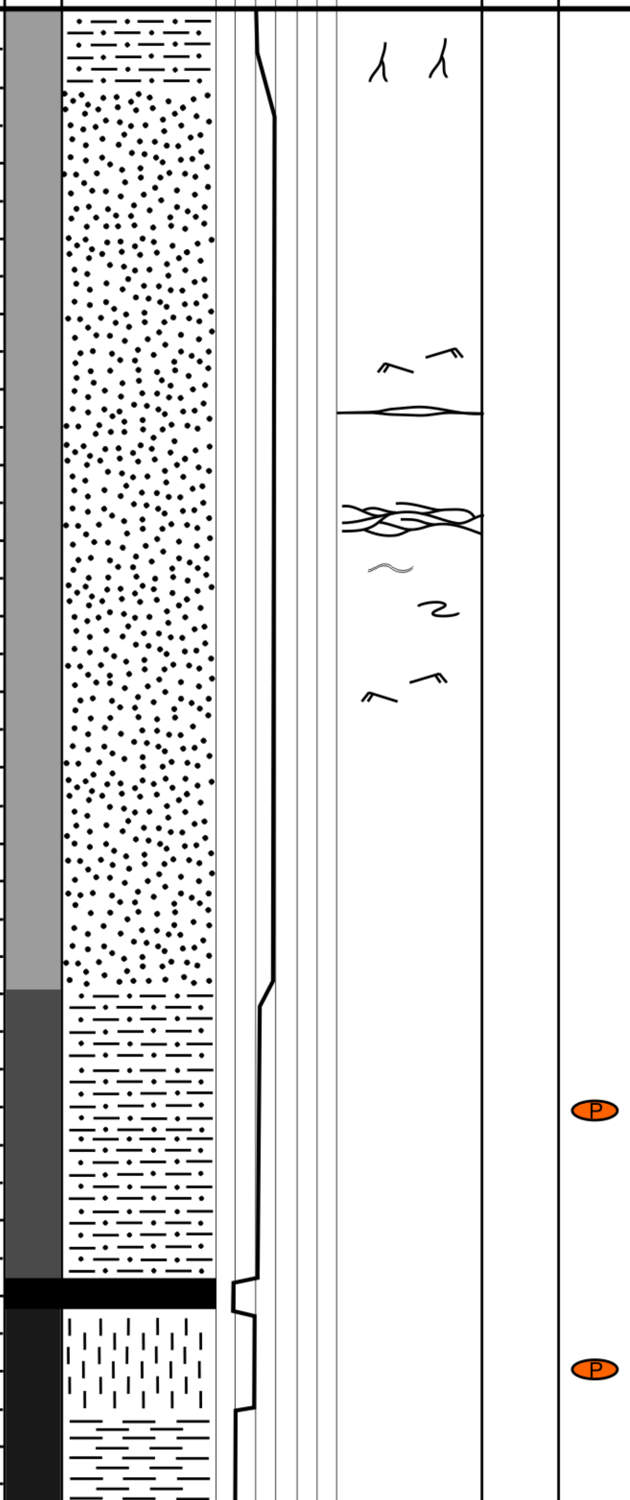
67

68

WELL NAME	Deffenbaugh Quarry #2	INTERVAL	810 - 830 ft	PAGE 23 OF 25
LOCATION	S1-T12S-R23E, NW-SW-SE, Johnson Co., KS			BOXES 68-70
COMPANY	Kansas Geological Survey	DESCRIBED BY	W.M. Brown	DATE January 2005

DEPTH (feet)	LITHOLOGY	CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST / CLASTICS: CLAY, SAND: Z, VF, F, M, C	SEDIMENTARY STRUCTURES	FOSSILS	POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX

DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic



810
812
814
816
818
820
822
824
826
828
830

Rooted and poorly laminated sandy shale.

Transitional contact.

Medium gray interlaminated shaley-sandstone. Very fine grained.

Lenticular, wavy, and flaser bedding. Mud drapes and double mud drapes.

Bi-directional current ripples.

Burrows

.

Pyritic laminated and lenticular shaley Sandstone.

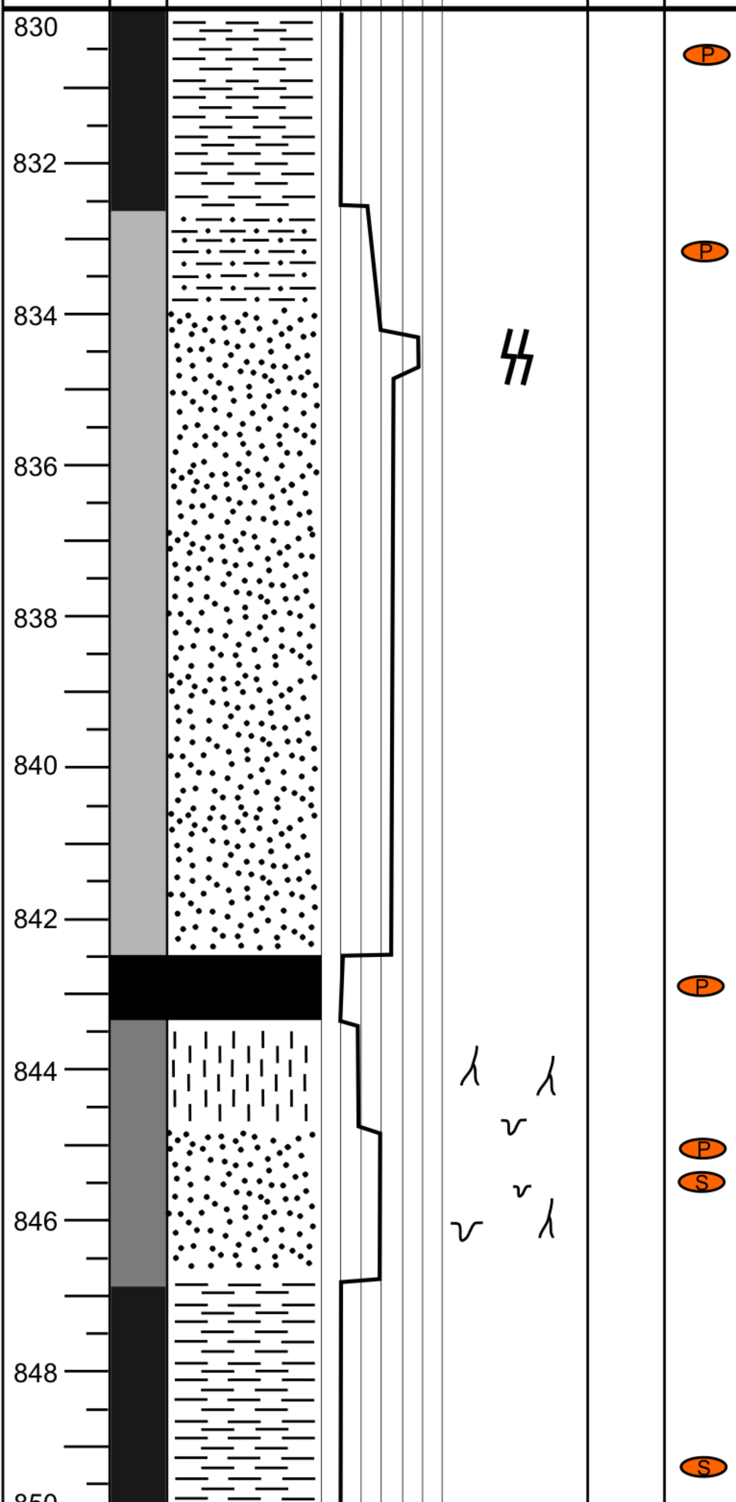
Black pyritic coal

Dark-gray to black pyritic shale

BOX: 69, 70

WELL NAME **Deffenbaugh Quarry #2**	INTERVAL **830 - 850 ft**	PAGE **24** OF **25**	
LOCATION **S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**		BOXES **70-71**	
COMPANY **Kansas Geological Survey**	DESCRIBED BY **W.M. Brown**	DATE **January 2005**	

DEPTH (feet)	LITHOLOGY / CARBONATES (EVAP, MUDST, WCKST, PCKST, GRNST, BNDST) / CLASTICS (CLAY, SAND: Z, VF, F, M, C) / SEDIMENTARY STRUCTURES / FOSSILS / POST-DEPOSITIONAL / DIAGENETIC FEATURES	DESCRIPTION - NOTES - Thickness - Color - Lithology (Grain Size, Sorting, Roundness) - Composition - Sedimentary Structures - Contacts - Body / Trace Fossils - Post-Depositional and Diagenetic	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX



Black pyritic shale

Sharp contact.
Medium gray pyritic non-laminated siltstone.

Concentric well-rounded yellow coarse-grained. Non-carbonate, but appear to be diagenetically altered ooids.

Laminated light-gray sandstone.

Brightly banded Riverton coal, 10% pyrite.

Medium-gray blocky siltstone.

Laminated and lenticular burrowed shaley sandstone. Pyrite and siderite common. Heterolithic.

2.11e

Dark gray to black sideritic shale.

Riverton coal

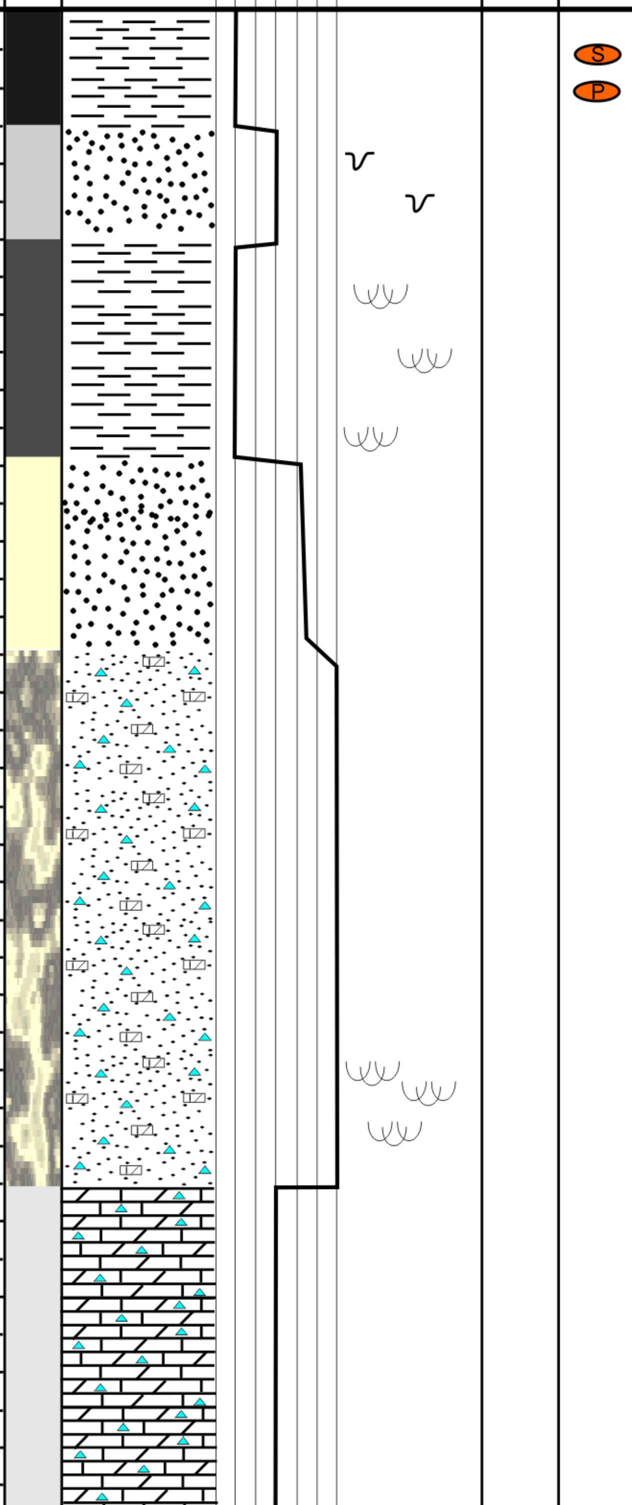
Top of the Riverton interval

71

70

WELL NAME	**Deffenbaugh Quarry #2**	INTERVAL **850 - 870 ft**	PAGE **25** OF **25**
LOCATION	**S1-T12S-R23E, NW-SW-SE, Johnson Co., KS**		BOXES **71-73**
COMPANY	**Kansas Geological Survey**	DESCRIBED BY **W.M. Brown**	DATE **January 2005**

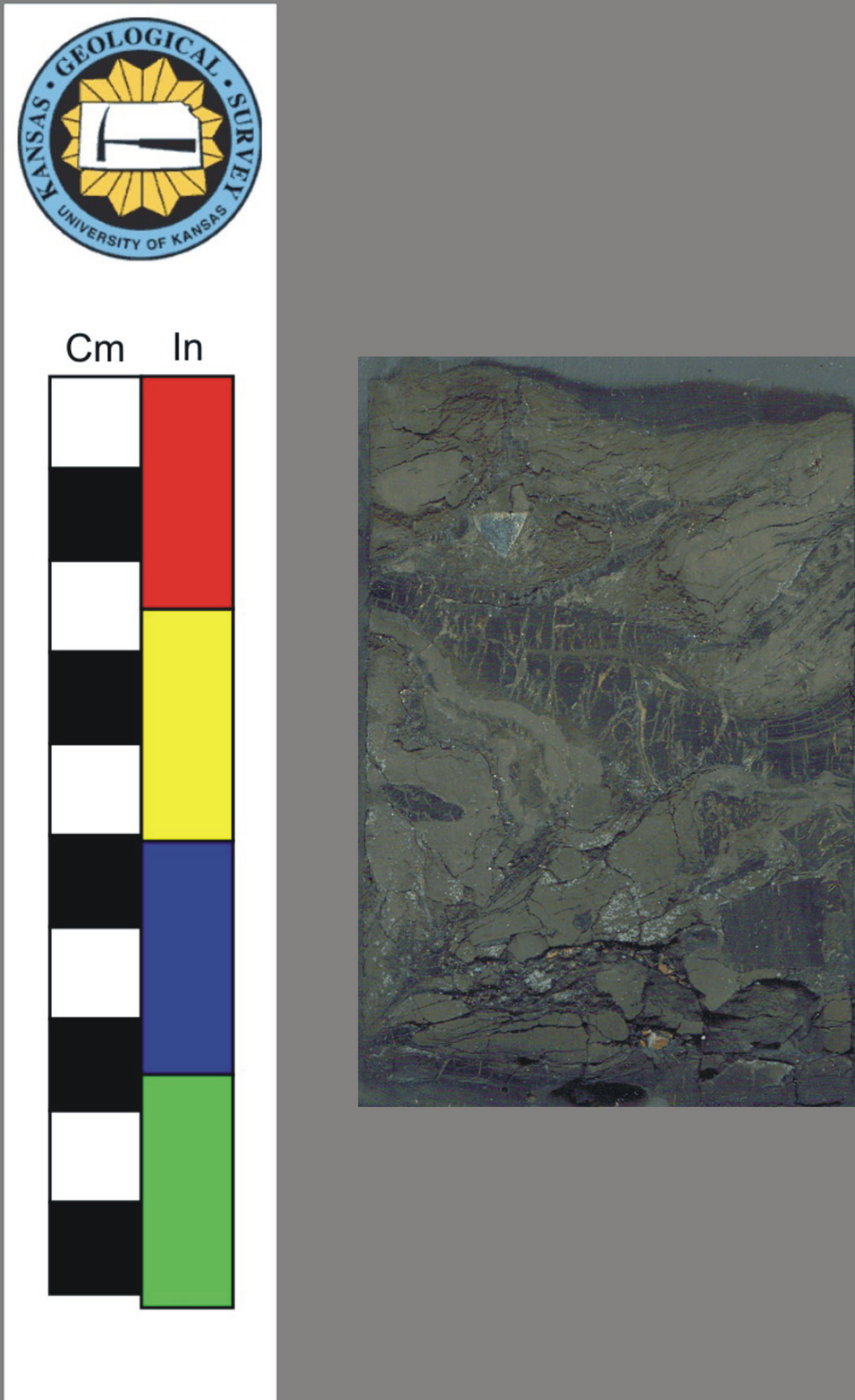
DEPTH (feet) | LITHOLOGY | CARBONATES: EVAP, MUDST, WCKST, PCKST, GRNST, BNDST; CLASTICS: CLAY, SAND Z, VF, F, M, C | SEDIMENTARY STRUCTURES | FOSSILS | POST-DEPOSITIONAL / DIAGENETIC FEATURES



DESCRIPTION - NOTES
- Thickness
- Color
- Lithology (Grain Size, Sorting, Roundness)
- Composition
- Sedimentary Structures
- Contacts
- Body / Trace Fossils
- Post-Depositional and Diagenetic

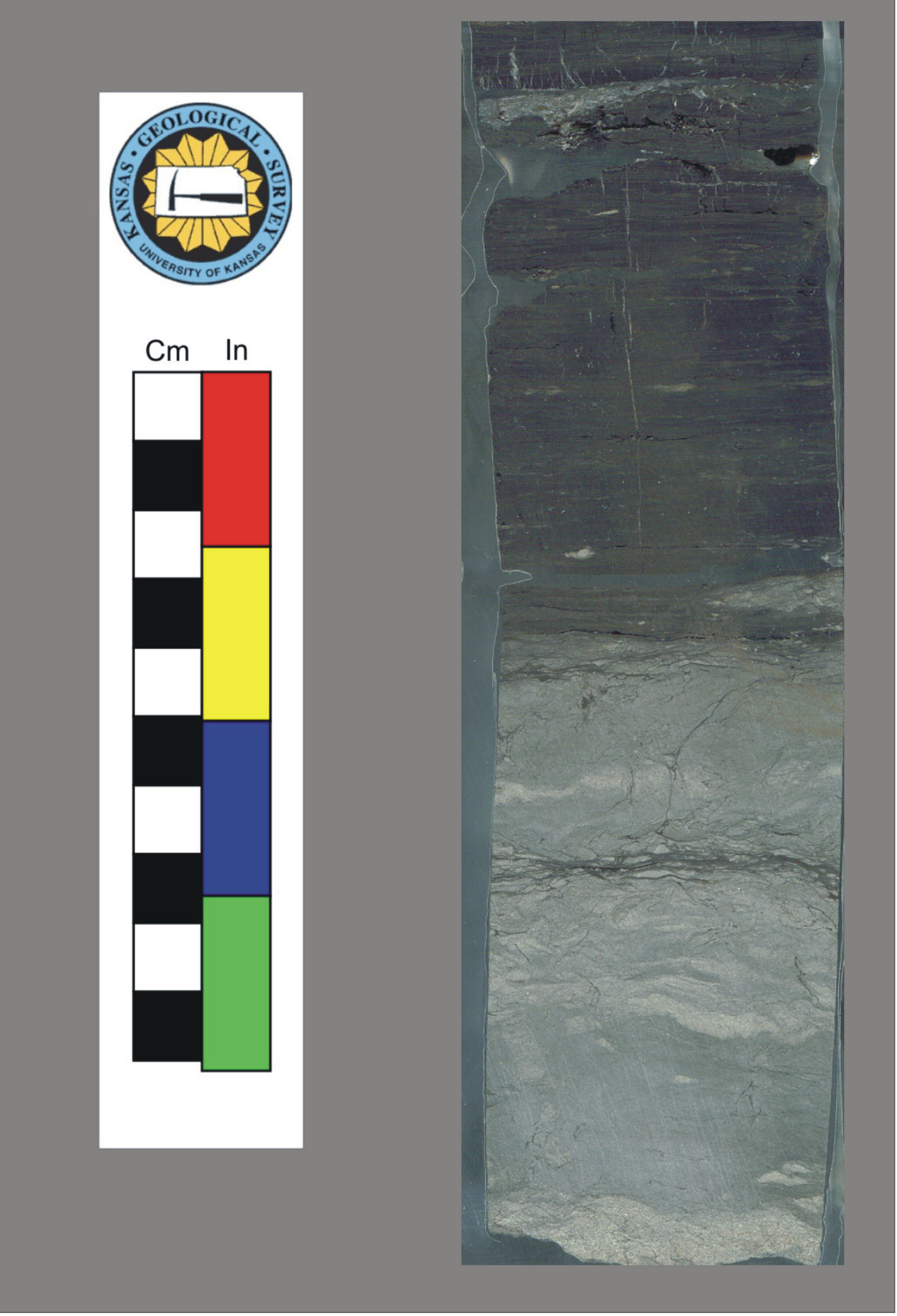
SURFACES, FACIES, INTERVAL, and COMMENTS

DEPTH (feet)	DESCRIPTION - NOTES	SURFACES, FACIES, INTERVAL, and COMMENTS	BOX
850	Dark-gray pyritic and sideritic shale.		
852	2’ burrowed fine-grained sandstone.		
854	Slickenslides		72
856			
858	Coarse yellowish sand. 10° dip on beds.		
860	Sand and shale matrix with 2-10 cm limestone, chert, and dolomite angluar clasts. 2.18a	Basal Pennsylvanian Conglomerate	
862			
864	2.18b Sharp based	Base of Pennsylvanian, Cherokee Group, and Riverton Interval	73
866	Very light-gray cherty dolomitic limestone.	Mississippian dolomitic cherty limestone	
868			
870	Well and Core TD.		



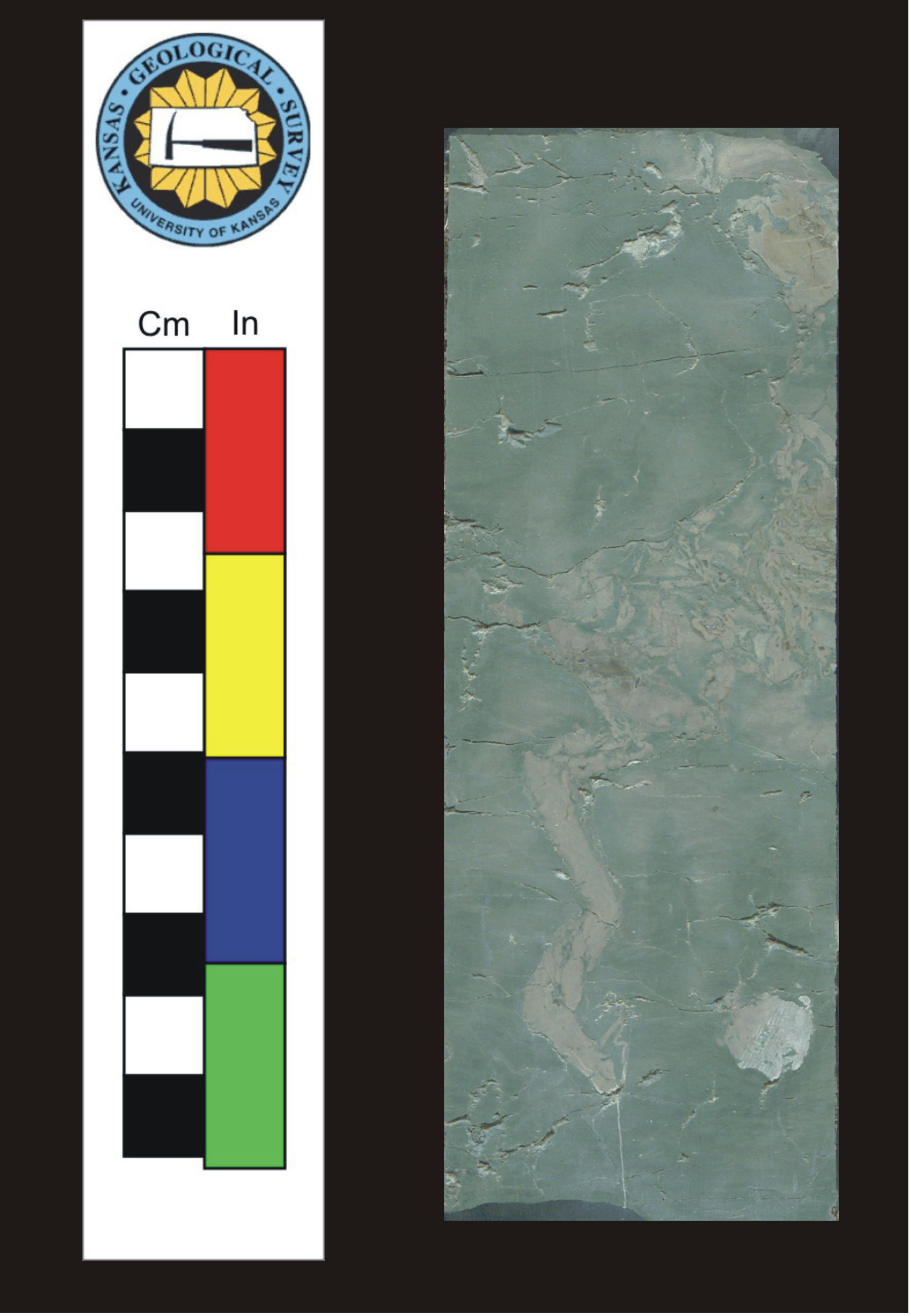
Pyrite within Mineral Coal, Deffenbaugh 638-638.3

Image 2.01e



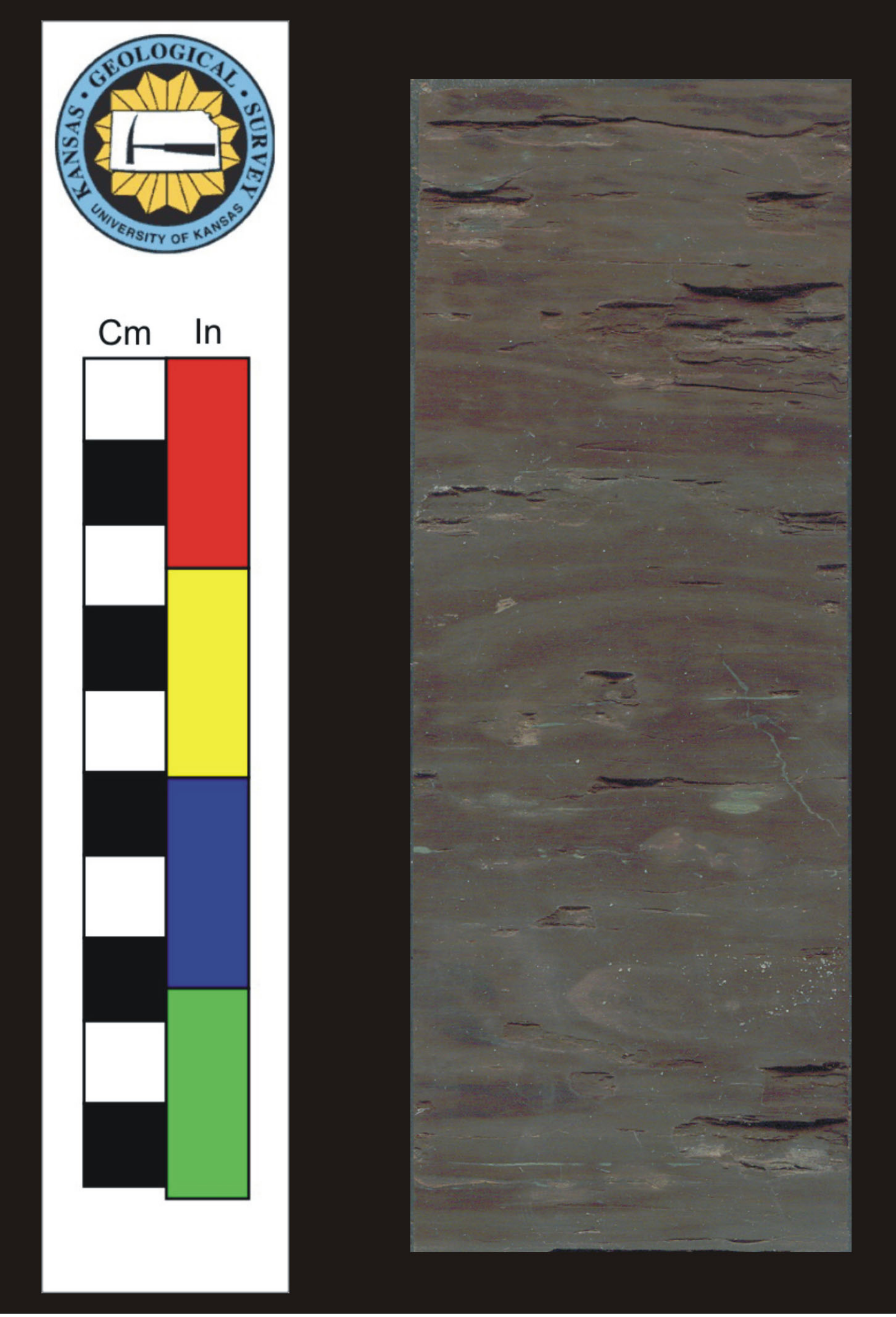
Transition of Blocky below to Coal above, sharp boundary. Deffenbaugh 529.4-529.11

Image 2.01a



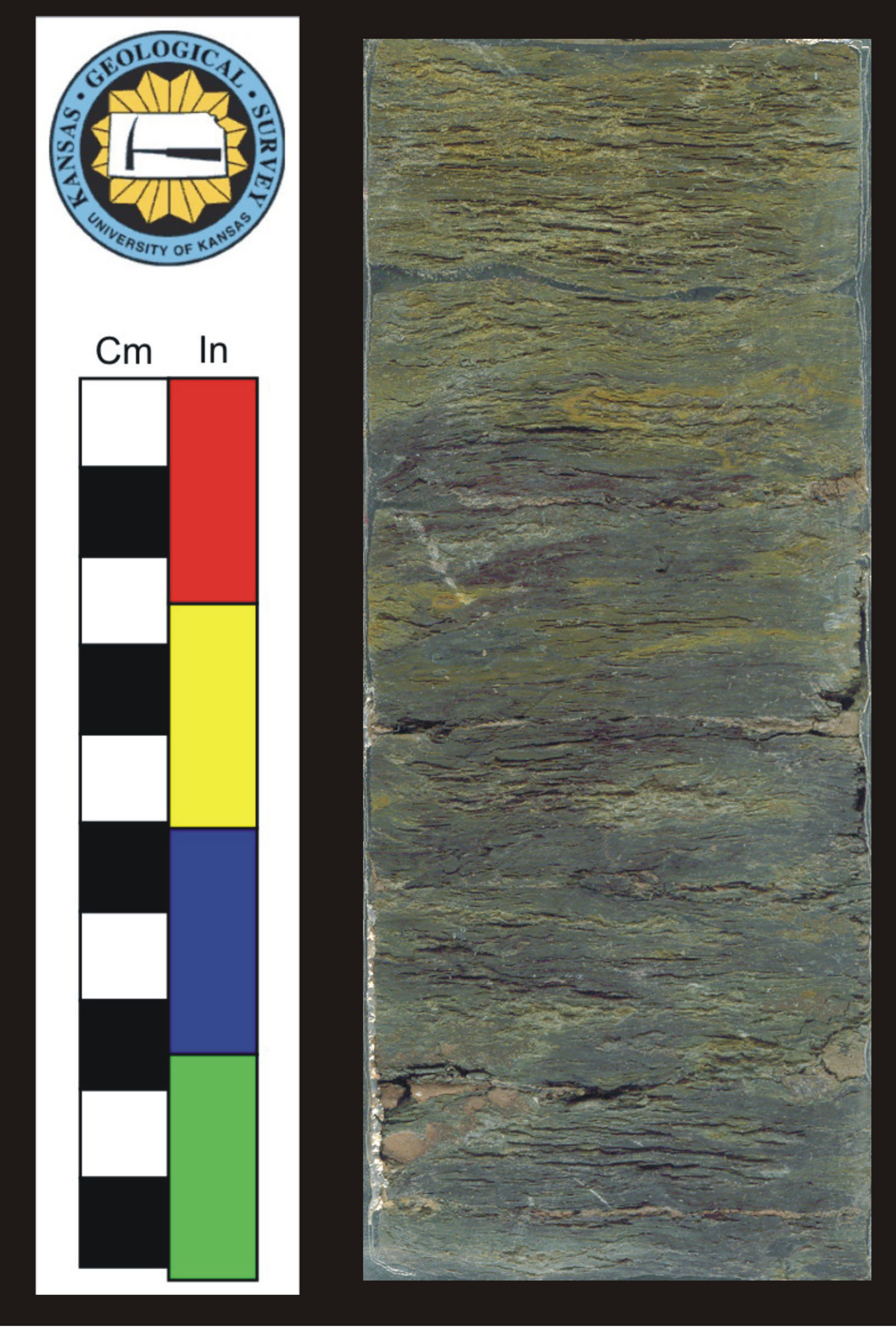
Blocky, Deffenbaugh380-380.4

Image 2.03c



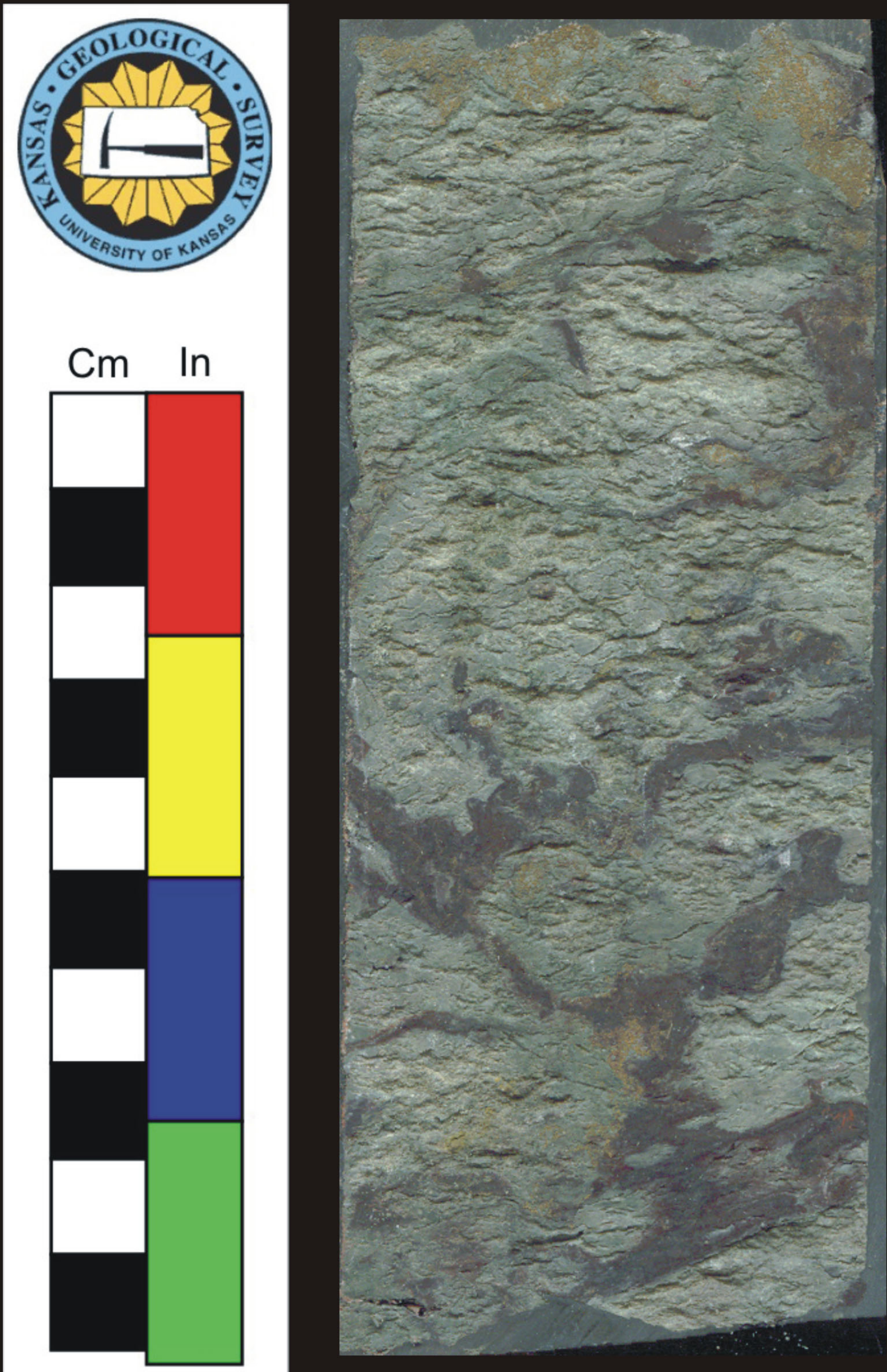
Blocky, Deffenbaugh 443.5-443.9

Image 2.03d



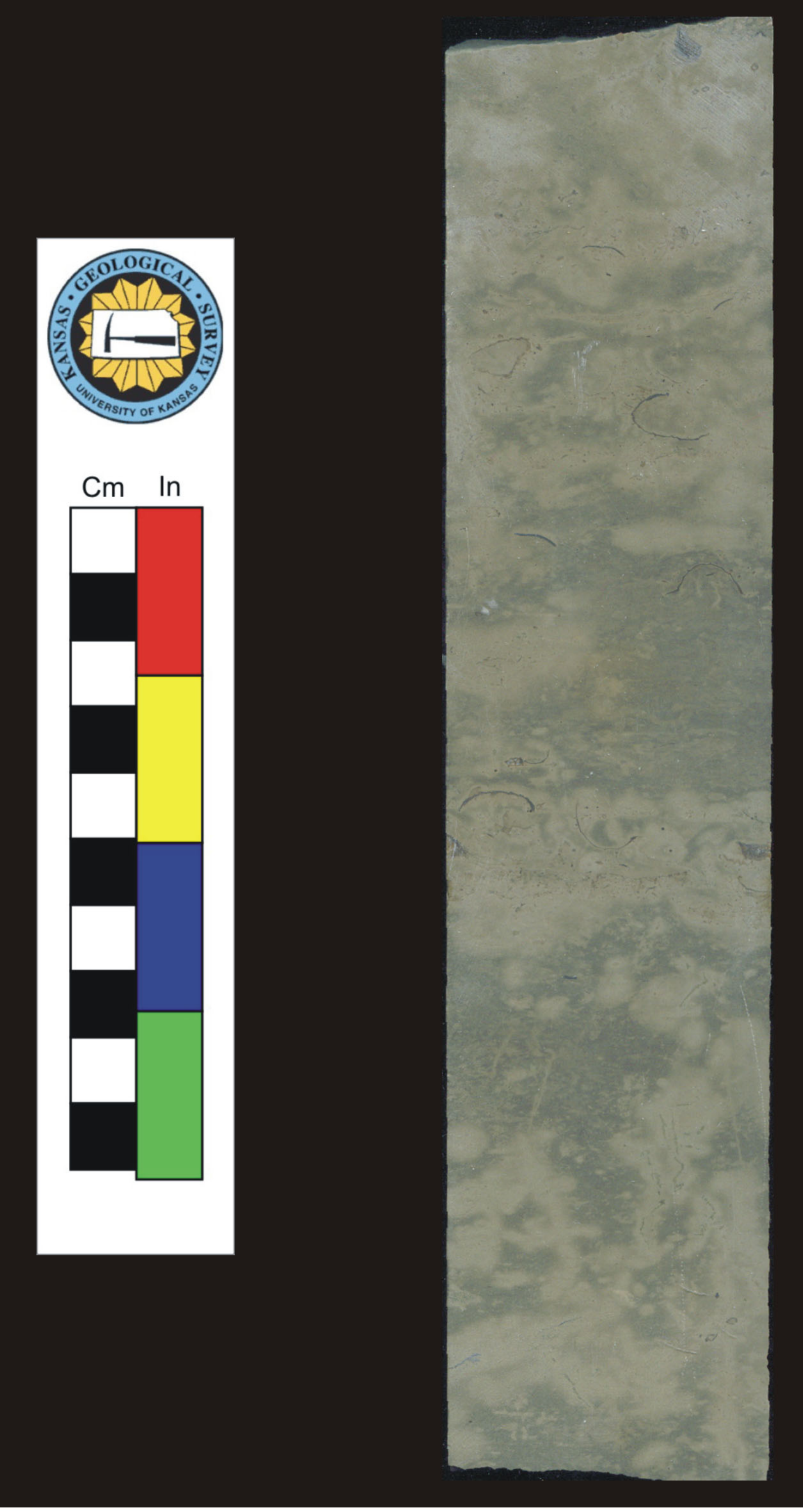
Blocky, Deffenbaugh #2, 595.10-596.4

Image 2.03a



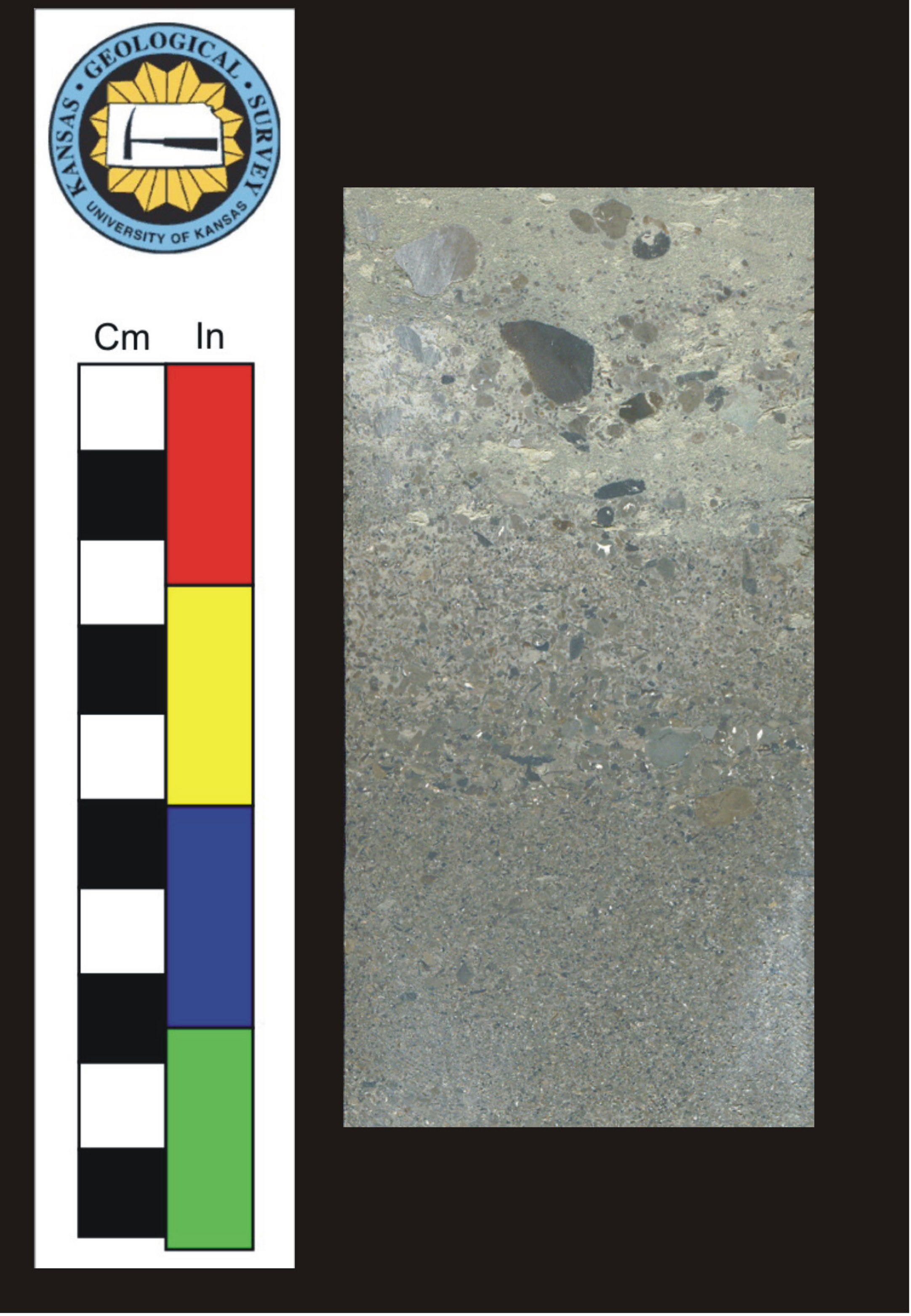
Blocky Facies, Deffenbaugh #2 well, 592.11-593.4

Image 2.03e



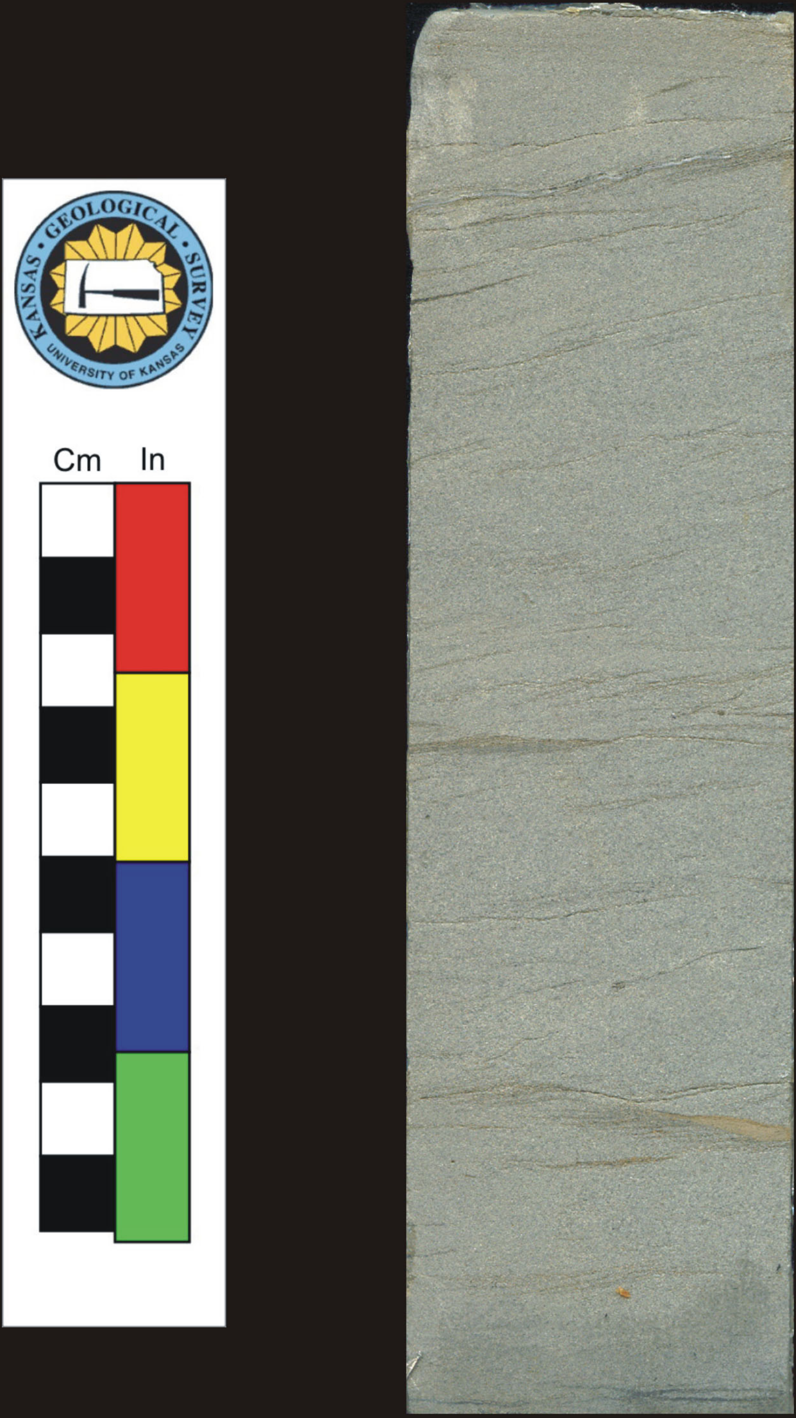
Mud-supported Carbonate, Deffenbaugh 467.3-468.1
BlackJack Creek limestone

Image 2.05b



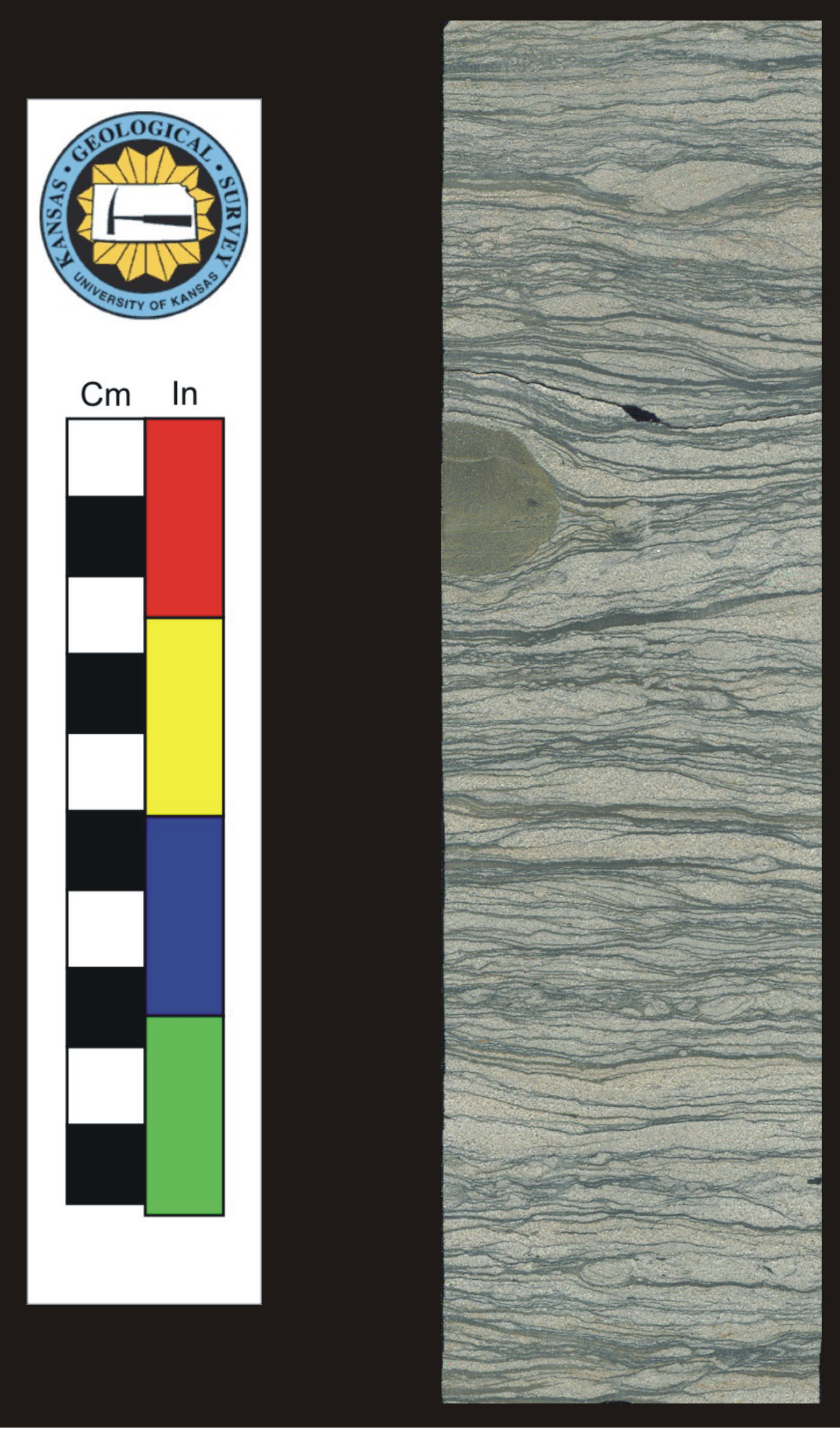
Grain-supported Carbonate, Deffenbaugh 376.11-377.4

Image 2.06



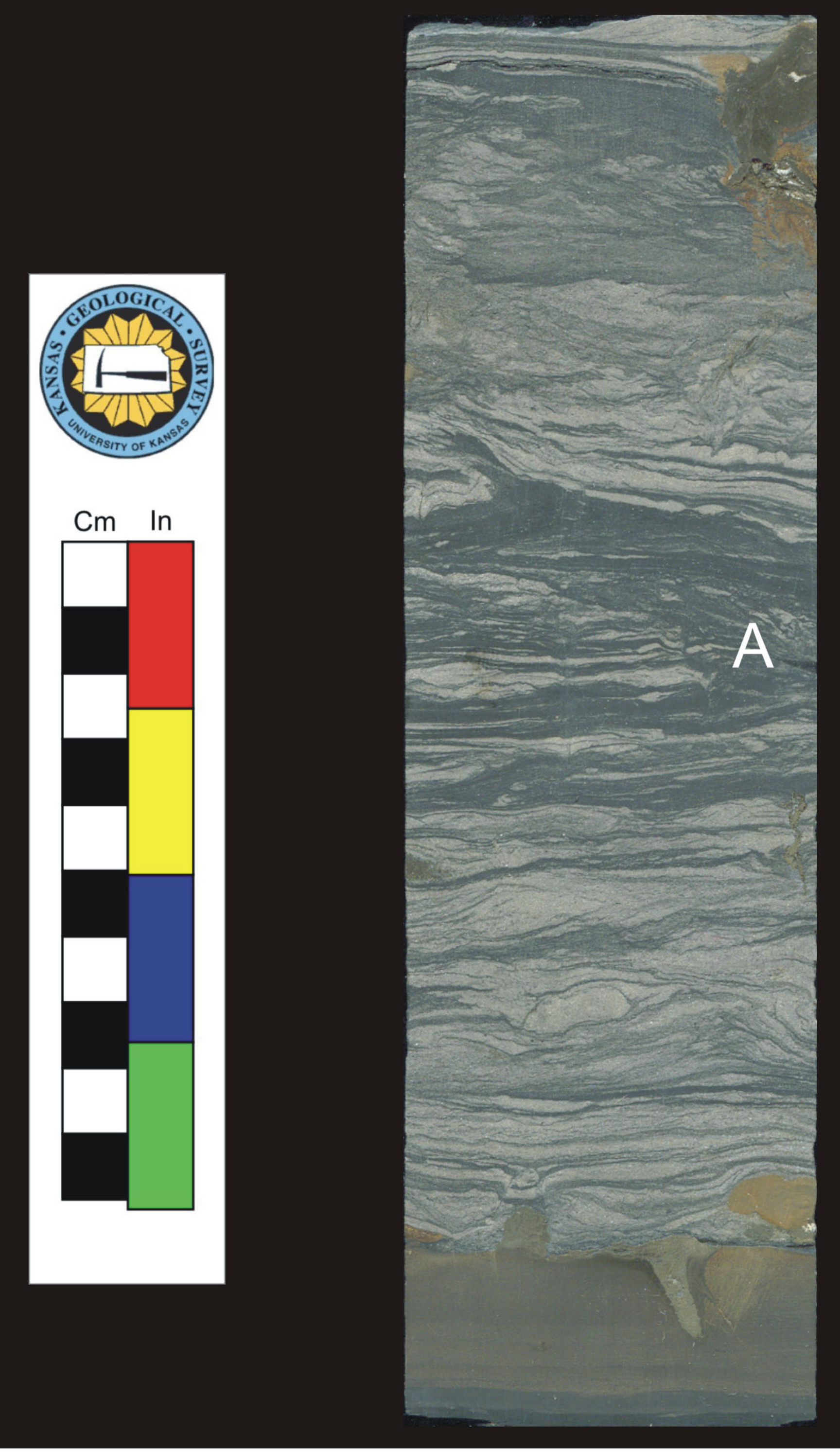
Sandstone Deffenbaugh 532.3-532.9

Image 2.08a



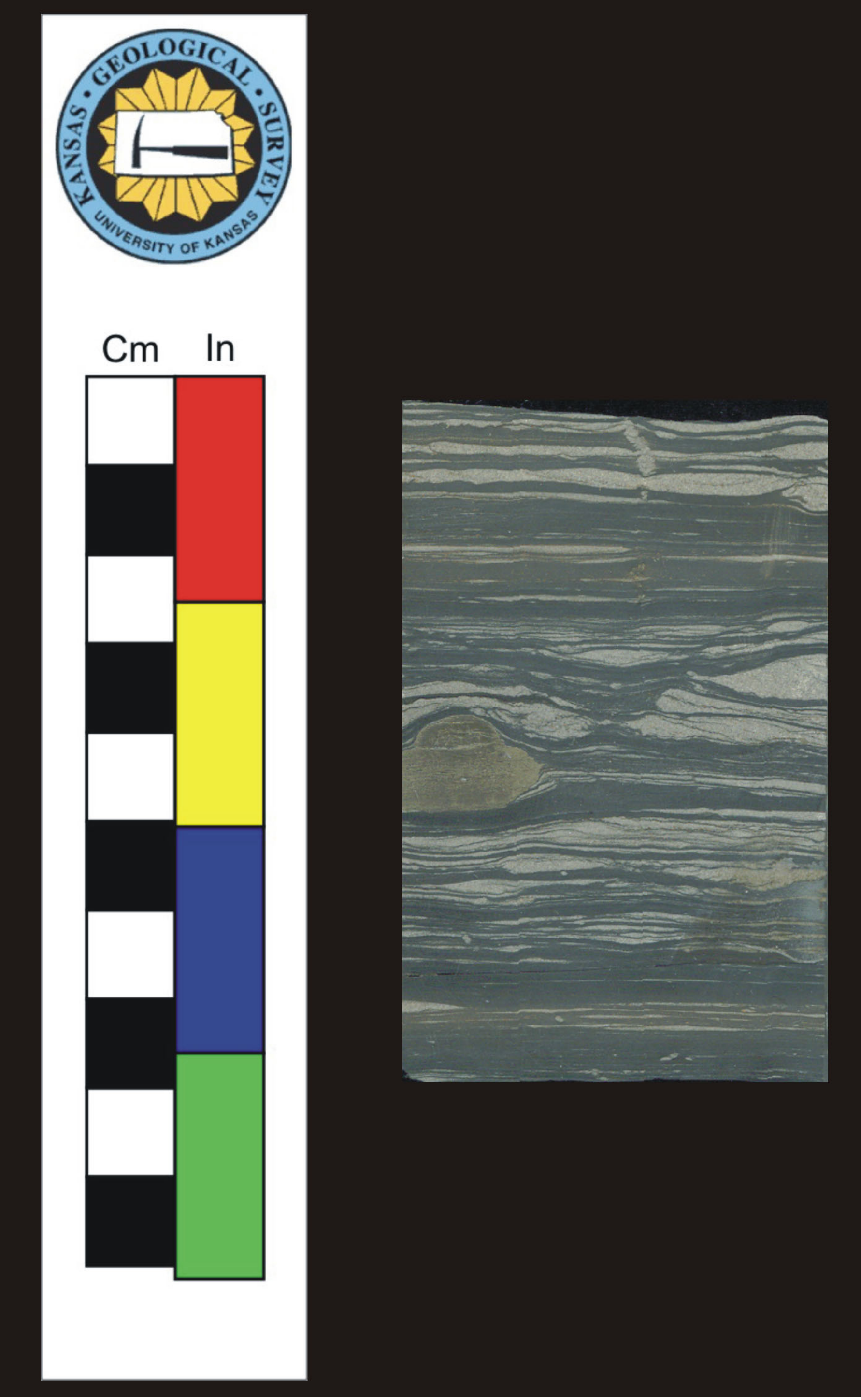
Heterolithic, Deffenbaugh 766.2-766.9

Image 2.11c



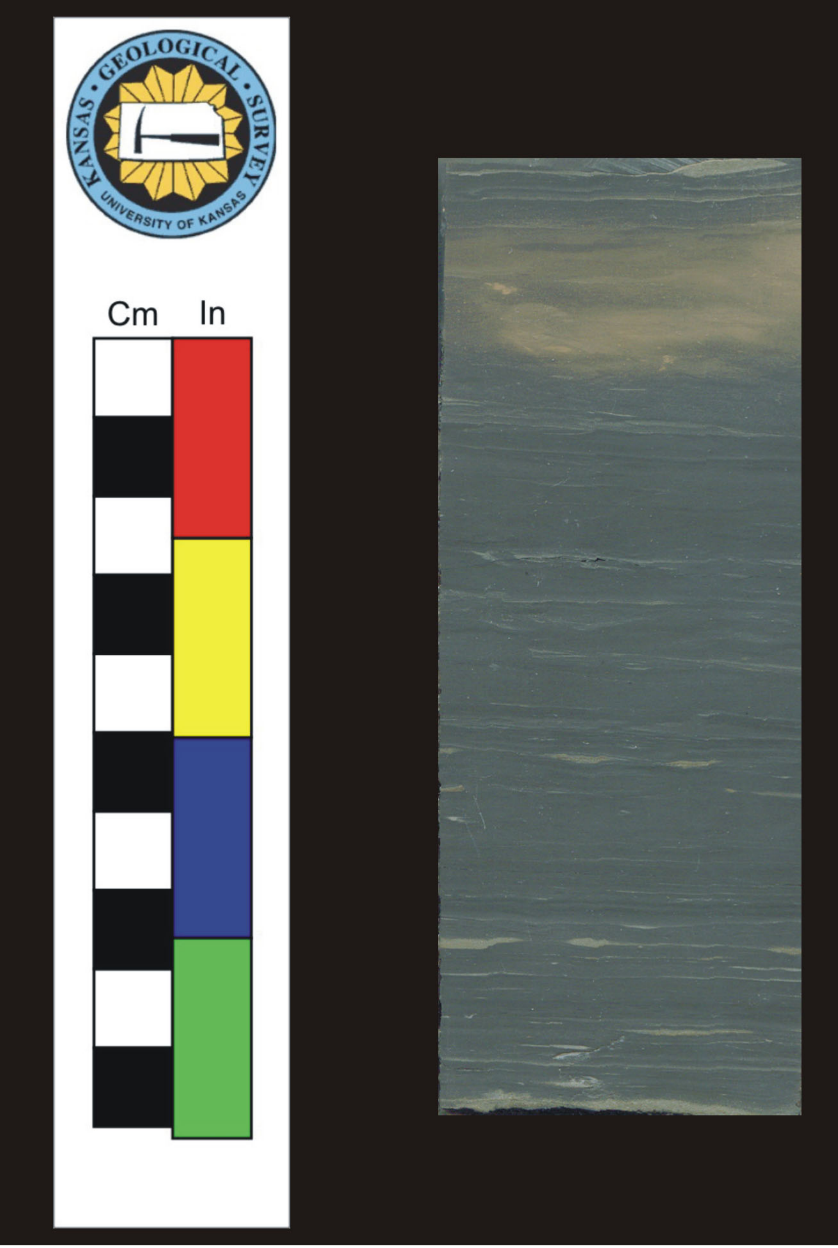
Heterolithic Deffenbaugh 845.9-846.5
A) Thin (2mm) coal laminae

Image 2.11e



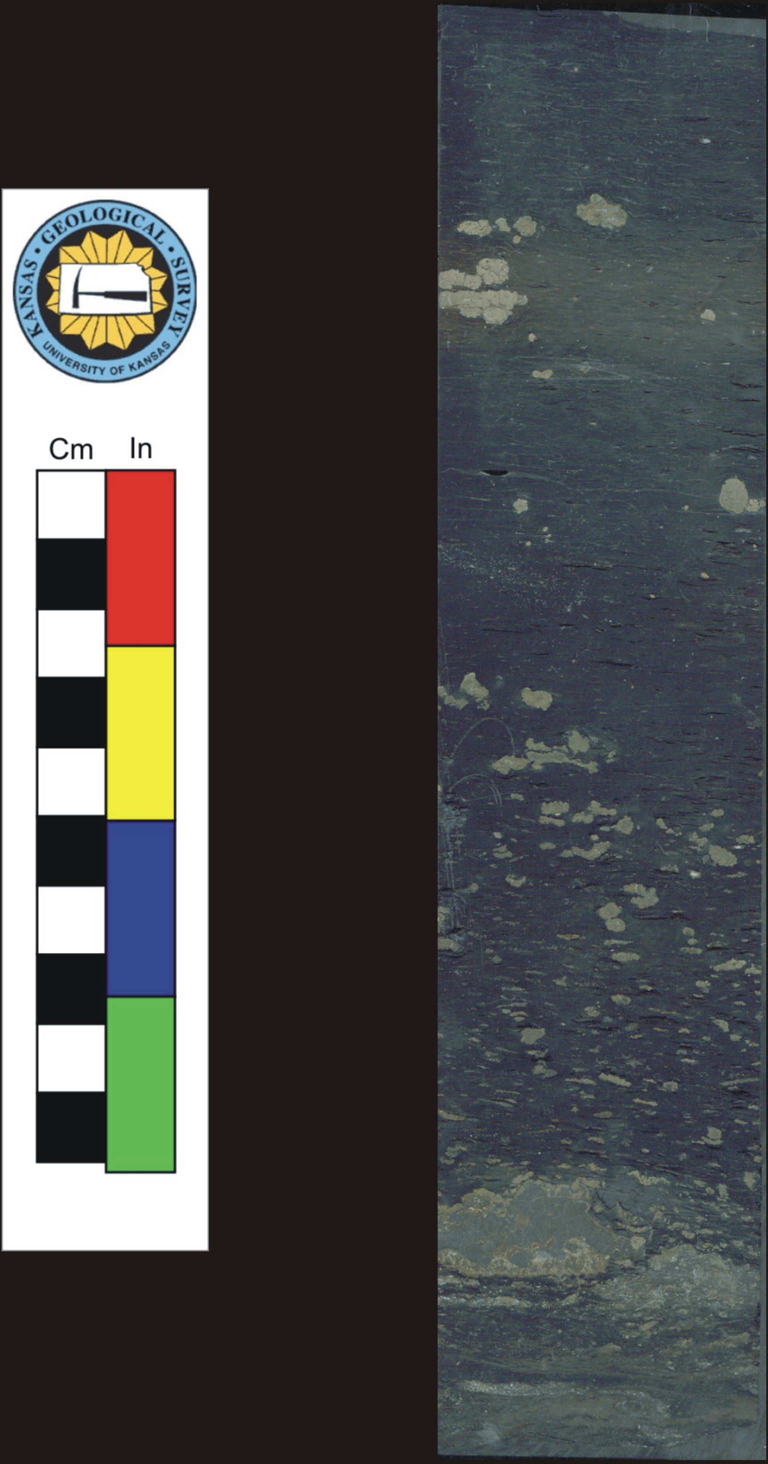
Heterolithic Deffenbaugh 791.6-791.9

Image 2.11f



Dark Gray Shale, Deffenbaugh 404.1-404.5

Image 2.13a

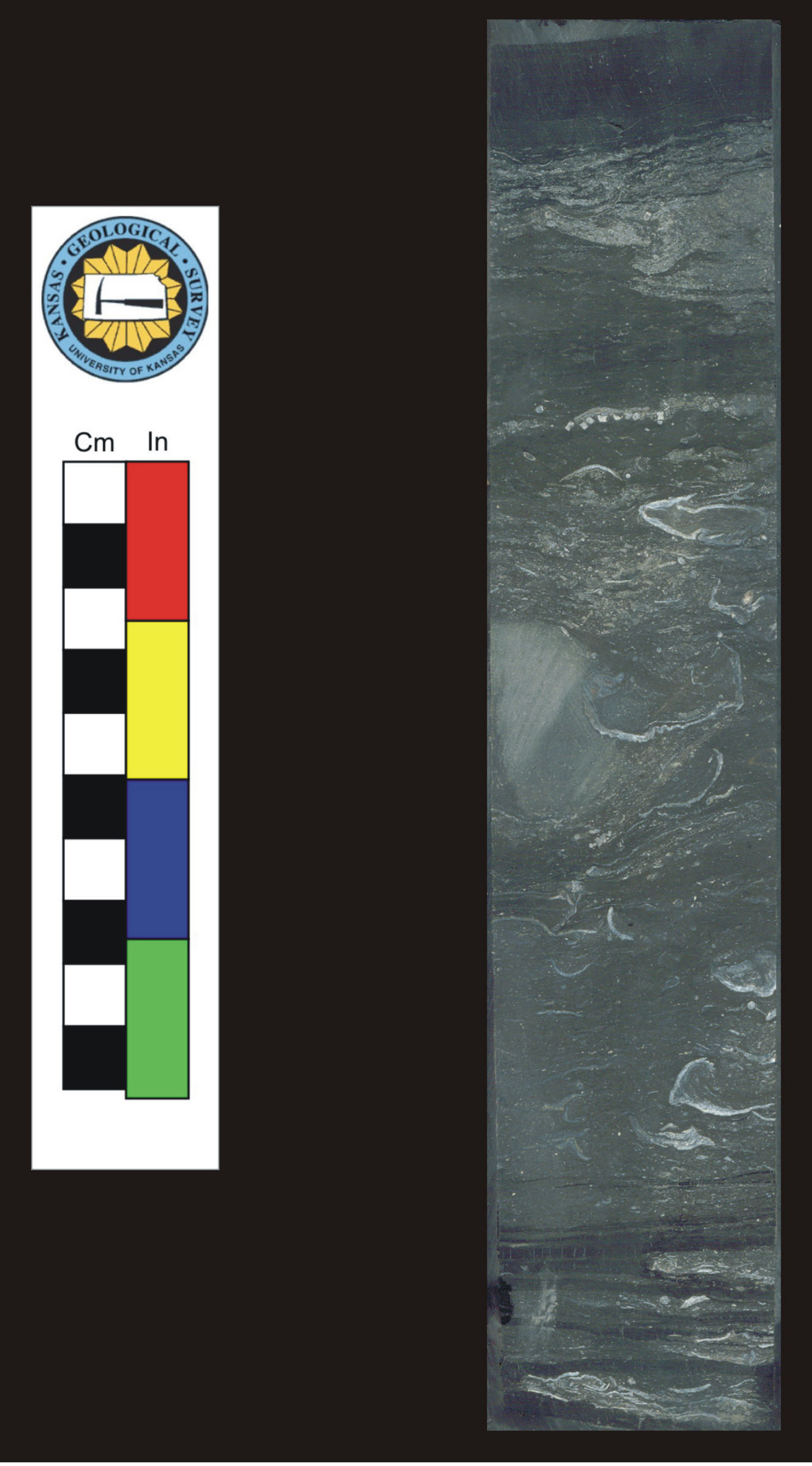


Pyritic Dark Gray Shale, Deffenbaugh 636.8-637.6

Image 2.13b

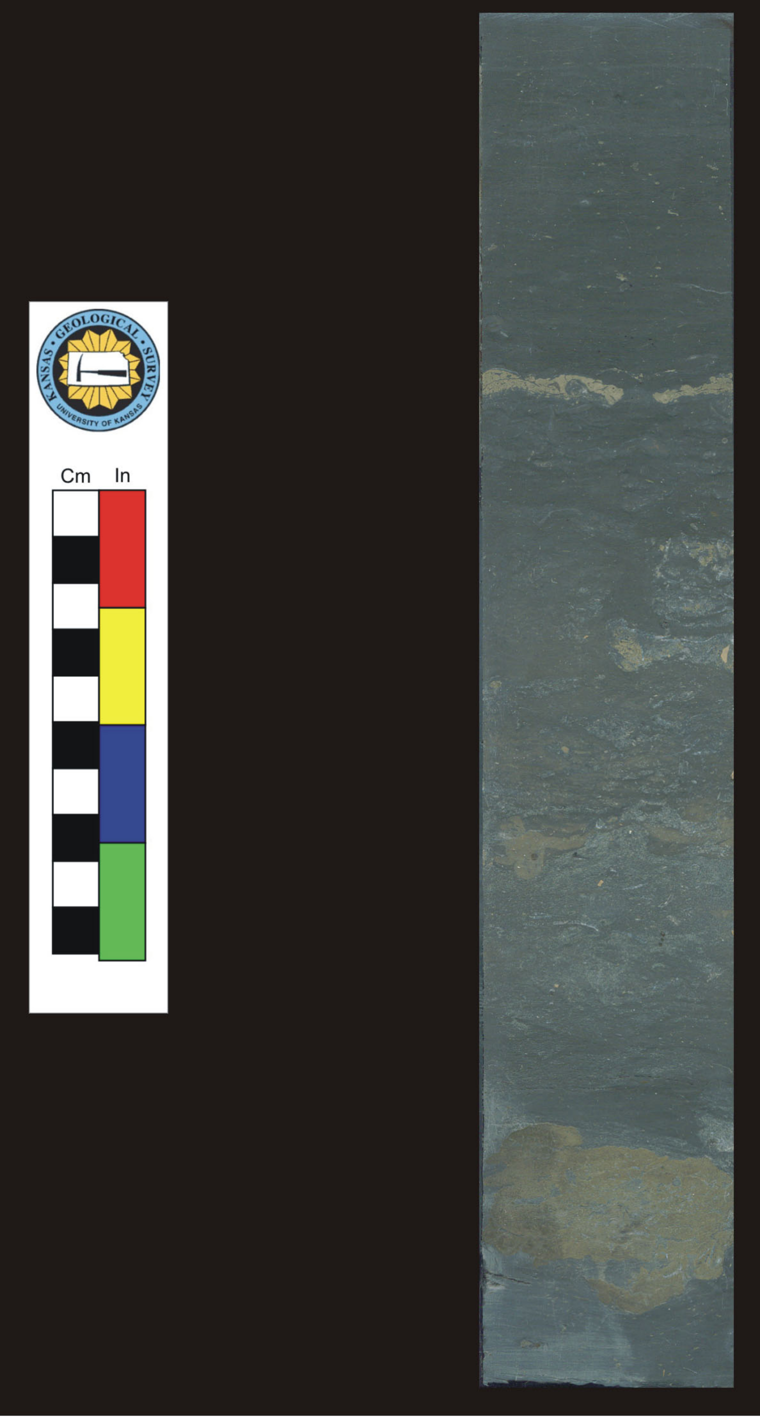
Phosphatic black shale, Deffenbaugh 604.5-605
Above Fleming Coal

Image 2.15



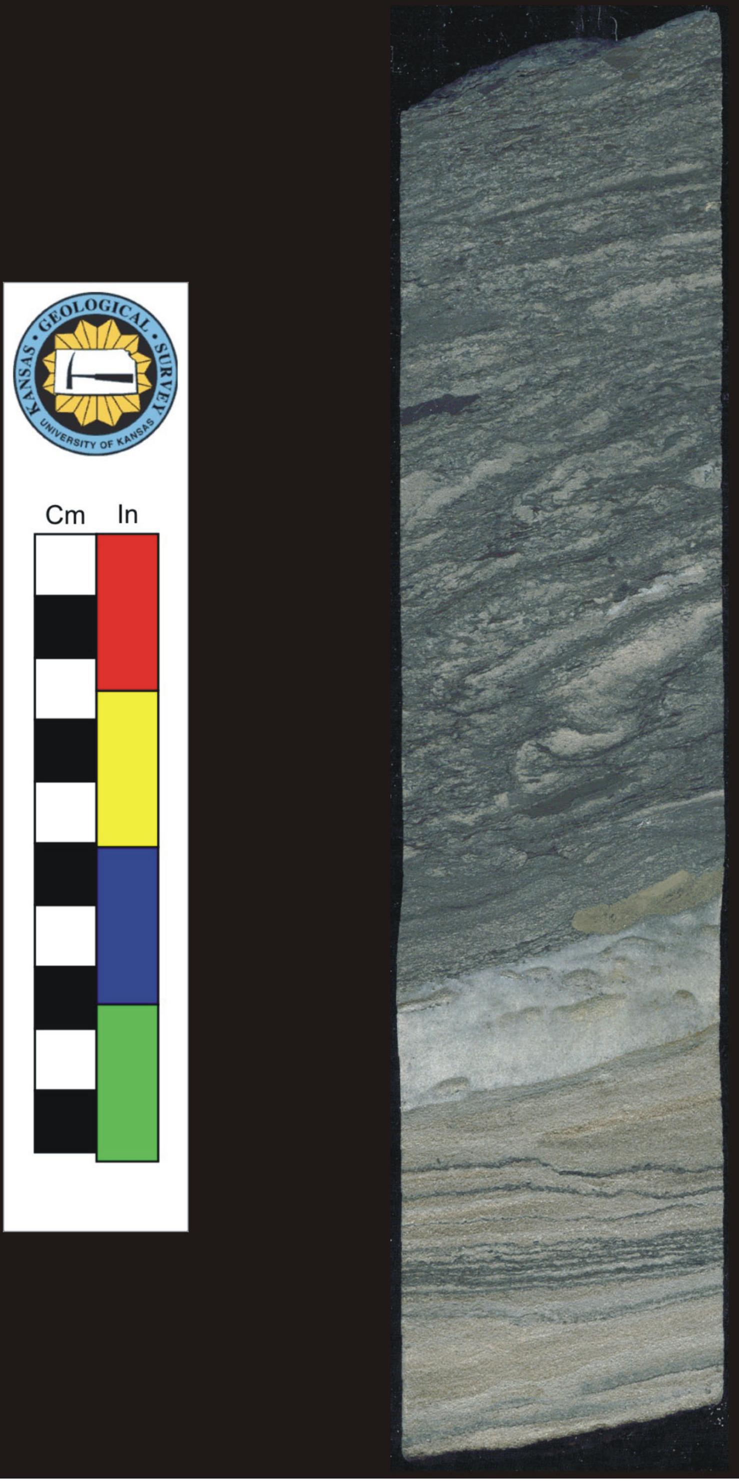
Shelly Lag, Deffenbaugh 457-457.9

Image 2.17a



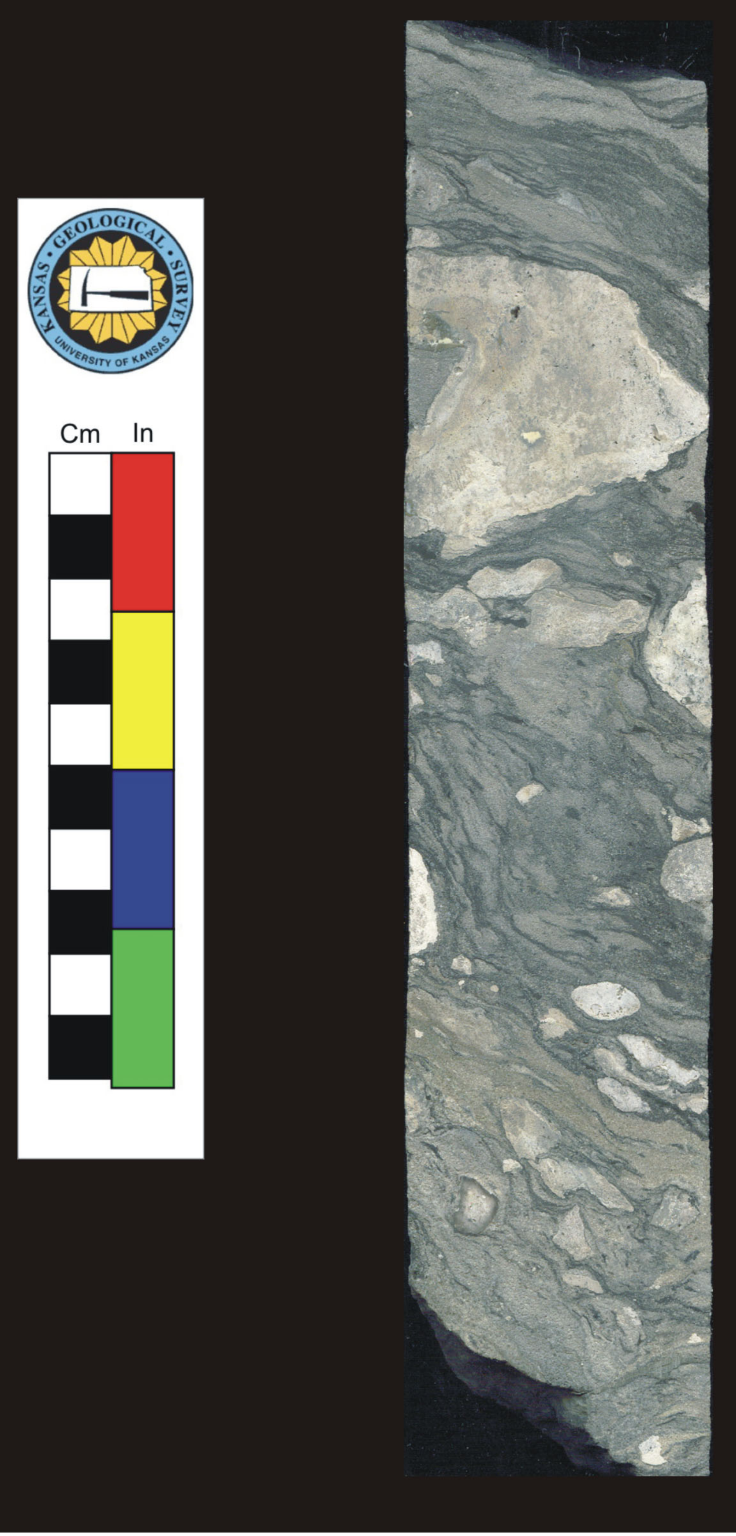
Pyritic Shelly Lag, Deffenbaugh 520-521

Image 2.17b



Conglomerate, Deffenbaugh 860.8-861.6

Image 2.18a



Conglomerate, Deffenbaugh 864.6-865.4

Image 2.18b