

County	POSEY			
T	5	S	R	12 W
Sec	SE	NW	SW	13
Other Survey				

Quarry or Pit.....Core...**X**....Dim.....Other.....
Name ..Survey Drill Hole #343.....
Former Names
.....
Operator
Former Operators

COAL AND INDUSTRIAL MINERALS SECTION
INDIANA GEOLOGICAL SURVEY
DEPARTMENT OF NATURAL RESOURCES
611 NORTH WALNUT GROVE
BLOOMINGTON, INDIANA 47401

MEMORANDUM REPORTS BY:	
Name	Date
1 Curtis H. Ault	Dec. 9, 1985
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REMARKS

Survey Drill Hole 343
 450' FSL x 340' FEL SE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 13, T. 5 S., R. 12 W.
 Posey County, Indiana
 Elevation 572 feet
 Farm: Clarence Zeller
 Started October 16, 1985
 Completed December 9, 1985
 Driller: Sam Riddle
 Core description by Curtis H. Ault

Note: The description of the core from SDH 342, a twin to this hole, serves as a description of the rocks drilled in this hole above the core described below.

Unit	Description	Depth		Thick- ness	Sample
	Pennsylvanian, 409.8 ft. cored				
	Patoka Formation, 6.0 ft. cored				
	Unnamed member, 6.0 ft. cored				
1	Shale, gray to light-gray, soft, slickensides, slakes, irregular fracture; brown micritic nodule 1½-inch thick at 275.2'.	274.2		3.0	CA86-0235
2	Variegated shale that is green-gray, purple, and gray, soft, slakes, irregular fracture; becomes slightly calcareous near base with harder bands.	277.2		3.0	CA86-0236
	Shelburn Formation, 186.7 ft.				
	West Franklin Limestone Member, 2.4 ft.				
3	Limestone, light-buff to buff, micritic, one gastropod, many small inclusions of sparry calcite could be called birds-eye structure in part, some inclusions have shell-fragment outlines; some minor vein filling with calcite; thin green shale band at 281.2'.	280.2		2.4	CA86-0237
	Unnamed, 184.3 ft.				
4	Shale, gray to green-gray, thin calcareous bands in top one foot, micaceous, a few slickensides; sideritic grains and patches in part; becomes arenaceous towards base.	282.6	287.0	8.1	CA86-0238
4	Shale, gray to green-gray, thin calcareous bands in top one foot, micaceous, a few slickensides; sideritic grains and patches in part; becomes arenaceous towards base.	287.0	290.7		CA86-0239
5	Sandstone, light-gray, fine-grained, very thinly interbedded with shale, gray, arenaceous, micaceous in part; cross bedded in some bands.	290.7		5.9	CA86-0240
6	Sandstone, light green-gray, micaceous, carbonaceous flecks; a few thin shale bands in top and base.	296.6		0.4	CA86-0241

7	Thinly interbedded sandstone and shale as unit 5 above.	297.0		0.6	CA86-0242
8	Sandstone, light-gray, fine-grained, micaceous, carbonaceous flecks, thin vague carbonaceous laminae in part; slightly tilted beds in part; band of siderite grains at 311.6' and at base.	297.6	305.0	14.8	CA86-0243
8	Sandstone, light-gray, fine-grained, micaceous, carbonaceous flecks, thin vague carbonaceous laminae in part; slightly tilted beds in part; band of siderite grains at 311.6' and at base.	305.0	312.4		CA86-0244
9	Shale, gray, micaceous, arenaceous in varying amounts, sideritic grains in part.	312.4		3.2	CA86-0245
10	Shale, gray, to dark-gray, micaceous, carbonaceous flecks, slightly silty patches in part but very small percentage of unit; grades into below unit with arbitrary boundary.	315.6	322.0	38.4	CA86-0246
10	Shale, gray, to dark-gray, micaceous, carbonaceous flecks, slightly silty patches in part but very small percentage of unit; grades into below unit with arbitrary boundary.	322.0	327.0		CA86-0247
10	Shale, gray, to dark-gray, micaceous, carbonaceous flecks, slightly silty patches in part but very small percentage of unit; grades into below unit with arbitrary boundary.	327.0	332.0		CA86-0248
10	Shale, gray, to dark-gray, micaceous, carbonaceous flecks, slightly silty patches in part but very small percentage of unit; grades into below unit with arbitrary boundary.	332.0	337.0		CA86-0249
10	Shale, gray, to dark-gray, micaceous, carbonaceous flecks, slightly silty patches in part but very small percentage of unit; grades into below unit with arbitrary boundary.	337.0	342.0		CA86-0250
10	Shale, gray, to dark-gray, micaceous, carbonaceous flecks, slightly silty patches in part but very small percentage of unit; grades into below unit with arbitrary boundary.	342.0	348.0		CA86-0251
10	Shale, gray, to dark-gray, micaceous, carbonaceous flecks, slightly silty patches in part but very small percentage of unit; grades into below unit with arbitrary boundary.	348.0	354.0		CA86-0252
11	Shale, gray, micaceous, carbonaceous flecks, some sideritic bands and nodules; minor pyrite.	354.0	359.0	11.1	CA86-0253
11	Shale, gray, micaceous, carbonaceous flecks, some sideritic bands and nodules; minor pyrite.	359.0	365.1		CA86-0254
12	Shale, gray, micaceous, some carbonaceous flecks, sideritic bands and nodules; minor pyrite; a few arenaceous zones.	365.1	371.0	34.9	CA86-0255
12	Shale, gray, micaceous, some carbonaceous flecks, sideritic bands and nodules; minor pyrite; a few arenaceous zones.	371.0	377.0		CA86-0256

12	Shale, gray, micaceous, some carbonaceous flecks, sideritic bands and nodules; minor pyrite; a few arenaceous zones.	377.0	383.0		CA86-0257
12	Shale, gray, micaceous, some carbonaceous flecks, sideritic bands and nodules; minor pyrite; a few arenaceous zones.	383.0	389.0		CA86-0258
12	Shale, gray, micaceous, some carbonaceous flecks, sideritic bands and nodules; minor pyrite; a few arenaceous zones.	389.0	395.0		CA86-0259
12	Shale, gray, micaceous, some carbonaceous flecks, sideritic bands and nodules; minor pyrite; a few arenaceous zones.	395.0	400.0		CA86-0260
13	Shale, gray (slightly darker than above), finely micaceous, minor pyrite, a few sideritic bands and nodules.	400.0	403.0	7.3	CA86-0261
13	Shale, gray (slightly darker than above), finely micaceous, minor pyrite, a few sideritic bands and nodules.	403.0	407.3		CA86-0262
14	Sandstone, light-gray, micaceous, carbonaceous flecks; with thinly interbedded shale, gray, micaceous; many sedimentary structures -- current marks and burrows(?); some sideritic bands.	407.3		3.9	CA86-0263
15	Shale, gray, micaceous, carbonaceous flecks; some thin arenaceous bands and zones; some sideritic bands and nodules.	411.2		4.1	CA86-0264
16	Shale, as above, less arenaceous content, some slightly tilted bedding.	415.3	420.0	15.7	CA86-0265
16	Shale, as above, less arenaceous content, some slightly tilted bedding.	420.0	425.0		CA86-0266
16	Shale, as above, less arenaceous content, some slightly tilted bedding.	425.0	431.0		CA86-0267
17	Shale, gray, micaceous, carbonaceous flecks; very arenaceous to shaly sandstone, light-gray, fine-grained.	431.0		0.7	CA86-0268
18	Shale, gray, micaceous, carbonaceous flecks, some sideritic bands and nodules.	431.7		6.3	CA86-0269
19	Shale, gray, arenaceous, micaceous, carbonaceous flecks, to sandstone, light-gray, argillaceous, micaceous, carbonaceous flecks; has vertical sandstone-filled burrow-appearing structures about 1/2-inch wide; a few siderite nodules.	438.0		3.3	CA86-0270
20	Shale, gray, micaceous, carbonaceous flecks, sideritic bands and nodules, becoming very slightly darker with depth; basal few inches become black shale with pyrite laminations.	441.3	448.0	25.6	CA86-0271
20	Shale, gray, micaceous, carbonaceous flecks, sideritic bands and nodules, becoming very slightly darker with depth; basal few inches become black shale with pyrite laminations.	448.0	454.0		CA86-0272
20	Shale, gray, micaceous, carbonaceous flecks, sideritic bands and nodules, becoming very slightly darker with depth; basal few inches become black shale with pyrite laminations.	454.0	460.0		CA86-0273

20	Shale, gray, micaceous, carbonaceous flecks, sideritic bands and nodules, becoming very slightly darker with depth; basal few inches become black shale with pyrite laminations.	460.0	466.9		CA86-0274
	Dugger Formation, 133.3 ft.				
	Danville Coal Member 2.8 ft.				
21	Coal, slight amount of gas, some pyrite.	466.9		2.8	CA86-1000
	Unnamed or unassigned, 19.8 ft.				
22	Shale, gray, micaceous; pyritic in part, soft, slickensides.	469.7		4.4	CA86-0275
23	Shale, dark-gray to black, medium-grained pelletal texture in much of unit; some vertical to random oriented thin veins with vitrain filling.	474.1		0.8	CA86-0276
24	Siderite and shale bands and patches; gray to brown, heavy, minor calcite on fractures; massive.	474.9		2.1	CA86-0277
25	Shale, gray, soft, slickensides, irregular fractures; becoming harder near base.	477.0		2.0	CA86-0278
26	Shale, gray, harder than above, very small carbonaceous flecks; becoming slightly darker towards base.	479.0		5.1	CA86-0279
27	Coal, bright banded, with durain in bands; some calcite on cleat; very minor gas bleeding in one spot.	484.1		1.7	CA86-0280
28	Shale, gray, becoming calcareous to very calcareous towards base; soft at top with slickensides and root imprints.	485.8		3.7	CA86-0281
	Universal Limestone Member, 8.9 ft.				
29	Limestone, gray to tan, argillaceous to very argillaceous, micritic to finely crystalline, carbonaceous and coaly filling in some veins; may be calcareous mudstone in part; irregular fracture.	489.5		3.5	CA86-0282
30	Shale, green-gray, soft, slickensides, calcareous in zones.	493.0		0.7	CA86-0283
31	Limestone, gray-tan, micritic to very finely crystalline, a few apparent shell fragments and crinoid columnals; a few small carbonaceous inclusions, bands of more numerous skeletal fragments; minor pyrite.	493.7		4.7	CA86-0284
	Unnamed, 0.2 ft.				
32	Shale, green-gray, finely micaceous, carbonaceous imprints.	498.4		0.2	CA86-0285
	Hymera Coal Member, 0.1 ft.				
33	Shale, dark gray to black, coaly, with vitrain streaks and possible durain.	498.6		0.1	CA86-0286
	Unnamed, 4.4 ft.				

34	Shale, distinctive green and gray-green banding, finely micaceous; banding apparently disturbed in places by roots.	498.7		4.4	CA86-0287
	Providence Limestone Member, 2.7 ft.				
35	Limestone, dark-brown to buff, micritic to very finely crystalline, fossiliferous zones with shell fragments and forams, sparry calcite in veins and vugs, pyrite, a few argillaceous laminations.	503.1		2.7	CA86-0288
	Unnamed, 0.7 ft.				
36	Shale, black, with limestone bands, as above, pyrite, vitrain bands in part, becoming coaly at base.	505.8		0.7	CA86-0289
	Herrin Coal Member, 3.0 ft.				
37	Coal, bright banded, pyrite parting 1.85' from top and shale parting 2.35' from top.	506.5		3.0	CA86-0290
	Unnamed and unassigned, 87.1 ft.				
38	Shale, gray, to green-gray, slakes readily, many carbonaceous imprints.	509.5		2.3	CA86-1001
39	Thinly interbedded gray and green-gray shale with sandstone, light-gray, fine-grained, micaceous; unit is calcareous in spots; carbonaceous inclusions; a few hard very-dark-gray inclusions that may be siderite.	511.8	515.0	7.1	CA86-0291
39	Thinly interbedded gray and green-gray shale with sandstone, light-gray, fine-grained, micaceous; unit is calcareous in spots; carbonaceous inclusions; a few hard very-dark-gray inclusions that may be siderite.	515.0	518.9		CA86-0292
40	Sale, green-gray to gray, finely micaceous, minor sandstone, as above.	518.9		2.3	CA86-0293
41	Shale, gray-brown, mostly arenaceous, with sandstone banding and zones in part, fine-grained to very-fine-grained, micaceous carbonaceous flecks, slightly tilted bedding in part.	521.2		5.2	CA86-0294
42	Sandstone, light-gray, fine-grained, mostly calcareous in top 4 feet, micaceous, carbonaceous flecks; thin argillaceous laminations and some dark-gray shale bands.	526.4	530.0	7.6	CA86-0295
42	Sandstone, light-gray, fine-grained, mostly calcareous in top 4 feet, micaceous, carbonaceous flecks; thin argillaceous laminations and some dark-gray shale bands.	530.0	534.0		CA86-0296
43	Shale, gray, micaceous, carbonaceous flecks, arenaceous with thin bands of micaceous light-gray sandstone; a few bands of sandstone, light-gray, fine-grained, micaceous, carbonaceous flecks, some siderite grains.	534.0		1.7	CA86-0297
44	Sandstone, light-gray, fine-grained, micaceous, sideritic in part; a few bands of arenaceous gray shale.	535.7		4.4	CA86-0298

45	Shale, gray, mostly arenaceous, micaceous, carbonaceous flecks, thin laminations of sandstone, light-gray, fine-grained, carbonaceous flecks, some siderite.	540.1		3.3	CA86-0299
46	Sandstone, light-gray, fine-grained, carbonaceous flecks, minor mica, a few thin argillaceous laminae.	543.4		1.0	CA86-0300
47	Shale, dark-gray, micaceous, carbonaceous flecks, flattened siderite(?) grains; thin laminae and a few bands of sandstone, as above.	544.4		1.5	CA86-0301
48	Sandstone, as in unit 46 above.	545.9		2.0	CA86-0302
49	Sandstone, argillaceous, gray, fine-grained, with intimately intermixed carbonaceous laminae and dark argillaceous material that is micaceous; siderite grains.	547.9		1.4	CA86-0303
50	Shale, dark-gray, micaceous, arenaceous, with thin laminae of fine-grained micaceous light-gray sandstone.	549.3		2.1	CA86-0304
51	Sandstone, light-gray, fine-grained, micaceous, numerous carbonaceous flecks with some vitrain, clayey sideritic(?) grains.	551.4		0.6	CA86-0305
52	Shale and sandstone laminae as in unit 50.	552.0		3.2	CA86-0306
53	Sandstone, as in unit 51 above.	555.2		0.8	CA86-0307
54	Shale and sandstone laminae as in unit 50 above.	556.0		1.3	CA86-0308
55	Sandstone, light-gray, fine-grained, micaceous, carbonaceous flecks, brown sideritic grains.	557.3		0.7	CA86-0309
56	Shale and sandstone laminae and bands; shale about 80% of interval; shale is gray, micaceous, carbonaceous flecks, arenaceous in bands and zones; sandstone is as above; some vitrain-chip inclusions.	558.0	563.0	10.3	CA86-0310
56	Shale and sandstone laminae and bands; shale about 80% of interval; shale is gray, micaceous, carbonaceous flecks, arenaceous in bands and zones; sandstone is as above; some vitrain-chip inclusions.	563.0	568.3		CA86-0311
57	Shale, gray to dark gray, finely micaceous, some sideritic grains, several sideritic bands.	568.3	573.8	8.4	CA86-0312
57	Shale, gray to dark gray, finely micaceous, some sideritic grains, several sideritic bands.	573.8	576.7		CA86-0313
58	Shale, dark-gray to black, finely micaceous, sideritic bands; slightly calcareous.	576.7		5.0	CA86-0314
59	Shale, gray, very-finely micaceous, carbonaceous flecks, minor pyrite; some sideritic bands in basal half.	581.7	586.0	14.9	CA86-0315
59	Shale, gray, very-finely micaceous, carbonaceous flecks, minor pyrite; some sideritic bands in basal half.	586.0	591.0		CA86-0316

59	Shale, gray, very-finely micaceous, carbonaceous flecks, minor pyrite; some sideritic bands in basal half.	591.0	596.6		CA86-0317
	Alum Cave Limestone Member, 2.0 ft.				
60	Shale, dark-gray, very calcareous to limestone, dark-gray-brown, micritic, very argillaceous, numerous fossil fragments, gastropods, crinoid columnals, shell fragments; some fine-grained pyrite.	596.6		2.0	CA86-0318
	Unnamed 1.6 ft.				
61	Shale, black, a few calcareous spots, a very thin laminae of lighter colored shale.	598.6		1.6	CA86-0319
	Petersburg Formation, 83.8 ft. drilled				
	Springfield Coal Member, 3.6 ft.				
62	Coal, bright banded, no shale partings; pyrite bands at 601.3 and 601.5'; gas bubbling out of core.	600.2	602.2	3.6	CA86-1002
62	Coal, bright banded, no shale partings; pyrite bands at 601.3 and 601.5'; gas bubbling out of core.	602.2	603.8		86x1
	Unnamed, 80.2 ft.				
63	Shale, gray, soft, irregular fracture, carbonaceous root imprints, calcareous in part.	603.8		3.3	CA86-0320
64	Shale, gray, micaceous, irregular carbonaceous laminae in part, calcareous in part, arenaceous in part; 4-inch sandstone band at top, light-gray, fine-grained, micaceous, carbonaceous flecks, calcareous.	607.1		4.9	CA86-0321
65	Sandstone, light-brown-gray becoming light-gray with depth, fine-grained, micaceous, carbonaceous flecks, calcareous at top decreasing with depth; vertical fracture with calcite coating.	612.0		3.4	CA86-0322
66	Sandstone, light gray, fine-grained, slightly micaceous, carbonaceous flecks, slightly calcareous in part; gray shale laminae with carbonaceous flecks at top and a few at deeper depths.	615.4		3.2	CA86-0323
67	Core loss (rock bitted).	618.6		6.4	None
68	Sandstone and shale bands; sandstone is light gray, fine-grained, and slightly micaceous; carbonaceous flecks with very thin laminae in part composed of black carbonaceous material; shale is gray, finely micaceous, and carbonaceous.	625.0	629.0	9.0	CA86-0324
68	Sandstone and shale bands; sandstone is light gray, fine-grained, and slightly micaceous; carbonaceous flecks with very thin laminae in part composed of black carbonaceous material; shale is gray, finely micaceous, and carbonaceous.	629.0	634.0		CA86-0325

69	Sandstone and shale, as above; a few sideritic patches.	634.0		6.2	CA86-0326
70	Shale, gray, slightly micaceous, carbonaceous flecks, arenaceous with numerous thin laminae of fine grained sandstone; some bands and nodules of siderite; trace pyrite; calcareous in part.	640.2		5.4	CA86-0327
71	Shale, gray, many carbonaceous flecks, some micaceous zones, pyrite in part, arenaceous zones and laminae; slightly calcareous in part.	645.6		3.2	CA86-0328
72	Shale, gray to gray-brown, carbonaceous flecks, mostly slightly arenaceous but has thin sandstone laminae in places; arenaceous content decreases with depth; some tilted bedding in top 10 feet.	648.8	654.0	35.2	CA86-0329
72	Shale, gray to gray-brown, carbonaceous flecks, mostly slightly arenaceous but has thin sandstone laminae in places; arenaceous content decreases with depth; some tilted bedding in top 10 feet.	654.0	659.0		CA86-0330
72	Shale, gray to gray-brown, carbonaceous flecks, mostly slightly arenaceous but has thin sandstone laminae in places; arenaceous content decreases with depth; some tilted bedding in top 10 feet.	659.0	664.0		CA86-0331
72	Shale, gray to gray-brown, carbonaceous flecks, mostly slightly arenaceous but has thin sandstone laminae in places; arenaceous content decreases with depth; some tilted bedding in top 10 feet.	664.0	669.0		CA86-0332
72	Shale, gray to gray-brown, carbonaceous flecks, mostly slightly arenaceous but has thin sandstone laminae in places; arenaceous content decreases with depth; some tilted bedding in top 10 feet.	669.0	674.0		CA86-0333
72	Shale, gray to gray-brown, carbonaceous flecks, mostly slightly arenaceous but has thin sandstone laminae in places; arenaceous content decreases with depth; some tilted bedding in top 10 feet.	674.0	679.0		CA86-0334
72	Shale, gray to gray-brown, carbonaceous flecks, mostly slightly arenaceous but has thin sandstone laminae in places; arenaceous content decreases with depth; some tilted bedding in top 10 feet.	679.0	684.0		CA86-0335

DRILLER'S RECORD
(Indiana Geological Survey)

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SDH NUMBER: 343 FARM: Clarence Zeller COMMENCED: 08/16/85 COMPLETED: 12/09/85
LOCATION: COUNTY Posey TWP. 5S RGE. 12W SEC. 13 SE NW SW ELEVATION: 572'

CORE				LOG
RUN. NO.	FROM	TO	RECOVERY	DESCRIPTION
	0'	10'		Top soil, sandy tan clay
	10'	20'		Sandy tan clay
	20'	30'		Sandy tan clay
	30'	40'		Sandy tan clay, sandstone chips
	40'	50'		Sandstone, some gray clay
	50'	60'		Sandstone, some gray shale
	60'	70'		Sandstone, some gray shale
	70'	80'		Gray shale
	80'	90'		Gray shale, limestone
	90'	100'		Gray shale, some coal
	100'	110'		Sandy gray shale
	110'	120'		Sandy gray shale
	120'	130'		Sandy gray shale
	130'	140'		Gray shale
	140'	150'		Gray shale
	150'	160'		Gray shale, some sandstone

DRILLER'S RECORD
(Indiana Geological Survey)

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SDH NUMBER: 343 FARM: Clarence Zeller COMMENCED: 08/16/85 COMPLETED: 12/09/8
LOCATION: COUNTY Posey TWP. 5S RGE. 12W SEC. 13 SE NW SW ELEVATION: 572'

CORE				LOG
RUN. NO.	FROM	TO	RECOVERY	DESCRIPTION
	160'	170'		Gray shale, some sandstone
	170'	180'		Gray shale, some sandstone
	180'	190'		Gray shale, some sandstone
	190'	200'		Gray shale, some sandstone
	200'	210'		Sandstone, some shale
	210'	220'		Sandstone
	220'	230'		Sandstone
	230'	240'		Sandstone
	240'	250'		Sandstone
	250'	260'		Sandstone
	260'	274' 3"		Sandstone, gray shale
	274' 3"	284'	1	6'2"-Soft gray shale; 2'4"-Limestone; 1'3"-Gray shale
	284'	294'	2	10'-Sandy gray shale
	294'	304'	3	4'-Sandstone and shale; 6'-Sandstone
	304'	314'	4	10'-Sandstone
	314'	324'	5	10'-Light gray siltstone

DRILLER'S RECORD
(Indiana Geological Survey)

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SDH NUMBER: 343 FARM: Clarence Zeller COMMENCED: 08/16/85 COMPLETED: 12/09/85
LOCATION: COUNTY Posey TWP. 5S RGE. 12W SEC. 13 SE NW SW ELEVATION: 572'

CORE				LOG
RUN. NO.	FROM	TO	RECOVERY	DESCRIPTION
	324'	334'	6	10'-Light gray siltstone
	334'	344'	7	10'-Light gray siltstone
	344'	354'	8	10'-Gray shale, hard
	354'	364'	9	10'-Gray shale
	364'	374'	10	10'-Gray shale
	374'	384'	11	10'-Sandy gray shale
	384'	394'	12	10'-Sandy gray shale
	394'	404'	13	10'-Gray shale
	404'	414'	14	2'-Gray shale; 8'-Sandy gray shale
	414'	424'	15	10'-Sandy gray shale
	424'	434'	16	10'-Sandy gray shale
	434'	444'	17	10'-Gray shale
	444'	454'	18	10'-Gray shale
	454'	464'	19	9'10"-Gray shale; 2"-Loss (dropped core)
	464'	474'	20	2'11"-Gray shale; 2'10"-Coal; 4'3"-Gray shale
	474'	484'	21	4'-Dark gray limey shale; 6'-Gray shale

DRILLER'S RECORD
(Indiana Geological Survey)

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SDH NUMBER: 343 FARM: Clarence Zeller COMMENCED: 08/16/85 COMPLETED: 12/09/85
LOCATION: COUNTY Posey TWP. 5S RGE. 12W SEC. 13 SE NW SW ELEVATION: 572'

CORE				LOG
RUN. NO.	FROM	TO	RECOVERY	DESCRIPTION
	484'	494'	22	1'9"-Coal; 4'6"-Soft gray shale; 3'9"-Gray limey shale
	494'	504'	23	4'-Limestone; 6'-Dark gray shale
	504'	514'	24	2'-Limestone; 3'4"-Coal; 4'8"-Gray sandy shale
	514'	524'	25	10'-Gray sandy shale
	524'	534'	26	10'-Gray sandy shale
	534'	544'	27	10'-Gray sandy shale
	544'	554'	28	10'-Gray sandy shale
	554'	564'	29	10'-Gray sandy shale
	564'	574'	30	10'-Gray shale
	574'	584'	31	10'-Gray sandy shale
	584'	594'	32	10'-Gray shale
	594'	604'	33	4'-Gray shale; 2'2"-Black shale; 3'10"-Coal
	604'	614'	34	3'-Soft gray shale; 3'-Sandy gray shale; 4'-Sandstone
	614'	624'	35	4'7"-Sandstone; 4'5"-Loss (rock bit)
	624'	634'	36	9'-Sandstone; 1'-Loss (Rock bit)
	634'	644'	37	10'Sandstone

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LOCATION:	COUNTY	Posey	TWP.	5S	RGE.	12W	SEC.	13	SE NW SW	ELEVATION:	572'
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[illegible]

Indiana Geological Survey
Coal and Industrial Minerals Section
Survey Drill Hole 343
450' FSL x 340' FEL SE1/4NW1/4SW1/4 sec. 13, T. 5 S., R. 12 W.
Posey County, Indiana

BACKGROUND

This stratigraphic test, one of three drilled by the Indiana Geological Survey as stratigraphic reference sections for eastern Posey County, was cored from 274.2 feet, above the West Franklin Limestone Member of the Shelburn Formation, to 48.6 feet below the Springfield Coal Member of the Petersburg Formation. A twin hole, Survey drill hole 342, was cored from the bedrock surface to below the West Franklin. Survey drill hole 344, drilled about 4100 feet west of this hole, was cored from the Springfield Coal Member to 792 feet, below the Seelyville Coal Member of the Staunton Formation.

Indiana Geological Survey
Coal and Industrial Minerals Section
Survey Drill Hole 343
450' FSL x 340' FEL SE1/4NW1/4SW1/4 sec. 13, T. 5 S., R. 12 W.
Posey County, Indiana
Elevation 572 feet

Skeleton log

Note: See twin hole, SDH 342, for tops above the core from this test hole.

	Depth to <u>top (ft)</u>
PENNSYLVANIAN, 409.8 ft. cored	274.2
Patoka Fm., 6.0 ft. cored	274.2
Shelburn Fm., 186.7 ft.	280.2
West Franklin Ls. Mbr., 2.4 ft.	280.2
Dugger Fm., 133.3 ft.	466.9
Danville Coal Mbr., 2.8 ft.	466.9
Unnamed coalbed, 1.7 ft.	484.1
Universal Ls. Mbr., 8.9 ft.	489.5
Hymera Coal Mbr., 0.1 ft.	498.6
Providence Ls. Mbr., 2.7 ft.	503.1
Herrin Coal Mbr., 3.0 ft.	506.5
Alum Cave Ls. Mbr., 2.0 ft.	596.6
Petersburg Fm., 83.8 ft. drilled	600.2
Springfield Coal Mbr., 3.6 ft.	600.2
Total Depth	684.0

Indiana Geological Survey
 Coal and Industrial Minerals Section
 Survey drill hole 343
 450' FSL x 340' FEL SE1/4NW1/4SW1/4 sec. 13, T. 5 S., R. 12 W.
 Posey County, Indiana
 Elevation 572 feet
 Farm: Clarence Zeller
 Started October 16, 1985
 Completed December 9, 1985
 Driller: Sam Riddle

Note: The description of the core from SDH 342, a twin to this hole, serves as a description of the rocks drilled in this hole above the core described below.

Core description by Curtis H. Ault

<u>Unit</u>	<u>Description</u>	<u>Depth to top of unit (ft)</u>	<u>Thickness ness (ft)</u>	<u>Sample No.</u>
	PENNSYLVANIAN, 409.8 ft. cored			
	<u>Patoka Formation, 6.0 ft. cored</u>			
	<u>Unnamed member, 6.0 ft. cored</u>			
1.	Shale, gray to light-gray, soft, slickensides, slakes, irregular fracture; brown micritic nodule 1 1/2-inch thick at 275.2'.	274.2	3.0	CA86-235
2.	Variegated shale that is green-gray, purple, and gray, soft, slakes, irregular fracture; becomes slightly calcareous near base with harder bands.	277.2	3.0	CA86-236
	<u>Shelburn Formation, 186.7 ft.</u>			
	<u>West Franklin Limestone Member, 2.4 ft.</u>			
3.	Limestone, light-buff to buff, micritic, one gastropod, many small inclusions of sparry calcite could be called birds-eye structure in part, some inclusions have shell-fragment outlines; some minor vein filling with calcite; thin green shale band at 281.2'.	280.2	2.4	CA86-237

Unnamed, 184.3 ft.

4.	Shale, gray to green-gray, thin calcareous bands in top one foot, micaceous, a few slickensides; sideritic grains and patches in part; becomes arenaceous towards base.	282.6	8.1	CA86-238 282.6-287.0 CA86-239 287.0-290.7
5.	Sandstone, light-gray, fine-grained, very thinly interbedded with shale, gray, arenaceous, micaceous in part; cross bedded in some bands.	290.7	5.9	CA86-240
6.	Sandstone, light green-gray, micaceous, carbonaceous flecks; a few thin shale bands in top and base.	296.6	0.4	CA86-241
7.	Thinly interbedded sandstone and shale as unit 5 above.	297.0	0.6	CA86-242
8.	Sandstone, light-gray, fine-grained, micaceous, carbonaceous flecks, thin vague carbonaceous laminae in part; slightly tilted beds in part; band of siderite grains at 311.6' and at base.	297.6	14.8	CA86-243 297.6-305.0 CA86-244 305.0-312.4
9.	Shale, gray, micaceous, arenaceous in varying amounts, sideritic grains in part.	312.4	3.2	CA86-245
10.	Shale, gray, to dark-gray, micaceous, carbonaceous flecks, slightly silty patches in part but very small percentage of unit; grades into below unit with arbitrary boundary.	315.6	38.4	CA86-246 315.6-322.0 CA86-247 322.0-327.0 CA86-248 327.0-332.0 CA86-249 332.0-337.0 CA86-250 337.0-342.0 CA86-251 342.0-348.0 CA86-252 348.0-354.0
11.	Shale, gray, micaceous, carbonaceous flecks, some sideritic bands and nodules; minor pyrite.	354.0	11.1	CA86-253 354.0-359.0 CA86-254 359.0-365.1

12.	Shale, gray, micaceous, some carbonaceous flecks, sideritic bands and nodules; minor pyrite; a few arenaceous zones.	365.1	34.9	CA86-255 365.1-371.0 CA86-256 371.0-377.0 CA86-257 377.0-383.0 CA86-258 383.0-389.0 CA86-259 389.0-395.0 CA86-260 395.0-400.0
13.	Shale, gray (slightly darker than above), finely micaceous, minor pyrite, a few sideritic bands and nodules.	400.0	7.3	CA86-261 400.0-403.0 CA86-262 403.0-407.3
14.	Sandstone, light-gray, micaceous, carbonaceous flecks; with thinly interbedded shale, gray, micaceous; many sedimentary structures -- current marks and burrows(?); some sideritic bands.	407.3	3.9	CA86-263
15.	Shale, gray, micaceous, carbonaceous flecks; some thin arenaceous bands and zones; some sideritic bands and nodules.	411.2	4.1	CA86-264
16.	Shale, as above, less arenaceous content, some slightly tilted bedding.	415.3	15.7	CA86-265 415.3-420.0 CA86-266 420.0-425.0 CA86-267 425.0-431.0
17.	Shale, gray, micaceous, carbonaceous flecks; very arenaceous to shaly sandstone, light-gray, fine-grained.	431.0	0.7	CA86-268
18.	Shale, gray, micaceous, carbonaceous flecks, some sideritic bands and nodules.	431.7	6.3	CA86-269
19.	Shale, gray, arenaceous, micaceous, carbonaceous flecks, to sandstone, light-gray, argillaceous, micaceous, carbonaceous flecks; has vertical sandstone-filled burrow-appearing structures about 1/2-inch wide; a few siderite nodules.	438.0	3.3	CA86-270

20.	Shale, gray, micaceous, carbonaceous flecks, sideritic bands and nodules, becoming very slightly darker with depth; basal few inches become black shale with pyrite laminations.	441.3	25.6	CA86-271 441.3-448.0 CA86-272 448.0-454.0 CA86-273 454.0-460.0 CA86-274 460.0-466.9
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Dugger Formation, 133.3 ft.

Danville Coal Member 2.8 ft.

21.	Coal, slight amount of gas, some pyrite.	466.9	2.8	CA86-1000
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Unnamed or unassigned, 19.8 ft.

22.	Shale, gray, micaceous; pyritic in part, soft, slickensides.	469.7	4.4	CA86-275
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23.	Shale, dark-gray to black, medium-grained pelletal texture in much of unit; some vertical to random oriented thin veins with vitrain filling.	474.1	0.8	CA86-276
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24.	Siderite and shale bands and patches; gray to brown, heavy, minor calcite on fractures; massive.	474.9	2.1	CA86-277
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25.	Shale, gray, soft, slickensides, irregular fractures; becoming harder near base.	477.0	2.0	CA86-278
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26.	Shale, gray, harder than above, very small carbonaceous flecks; becoming slightly darker towards base.	479.0	5.1	CA86-279
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27.	Coal, bright banded, with durain in bands; some calcite on cleat; <u>very</u> minor gas bleeding in one spot.	484.1	1.7	CA86-280 (86 x 5)
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28.	Shale, gray, becoming calcareous to very calcareous towards base; soft at top with slickensides and root imprints.	485.8	3.7	CA86-281
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Universal Limestone Member, 8.9 ft.

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| 29. | Limestone, gray to tan, argillaceous to very argillaceous, micritic to finely crystalline, carbonaceous and coaly filling in some veins; may be calcareous mudstone in part; irregular fracture. | 489.5 | 3.5 | CA86-282 |
| 30. | Shale, green-gray, soft, slickensides, calcareous in zones. | 493.0 | 0.7 | CA86-283 |
| 31. | Limestone, gray-tan, micritic to very finely crystalline, a few apparent shell fragments and crinoid columnals; a few small carbonaceous inclusions, bands of more numerous skeletal fragments; minor pyrite. | 493.7 | 4.7 | CA86-284 |

Unnamed, 0.2 ft.

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| 32. | Shale, green-gray, finely micaceous, carbonaceous imprints. | 498.4 | 0.2 | CA86-285 |
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Hymera Coal Member, 0.1 ft.

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| 33. | Shale, dark gray to black, coaly, with vitrain streaks and possible durain. | 498.6 | 0.1 | CA86-286 |
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Unnamed, 4.4 ft.

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| 34. | Shale, distinctive green and gray-green banding, finely micaceous; banding apparently disturbed in places by roots. | 498.7 | 4.4 | CA86-287 |
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Providence Limestone Member, 2.7 ft.

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| 35. | Limestone, dark-brown to buff, micritic to very finely crystalline, fossiliferous zones with shell fragments and forams, sparry calcite in veins and vugs, pyrite, a few argillaceous laminations. | 503.1 | 2.7 | CA86-288 |
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Unnamed, 0.7 ft.

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| 36. | Shale, black, with limestone bands, as above, pyrite, vitrain bands in part, becoming coaly at base. | 505.8 | 0.7 | CA86-289 |
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Herrin Coal Member, 3.0 ft.

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| 37. | Coal, bright banded, pyrite parting 1.85' from top and shale parting 2.35' from top. | 506.5 | 3.0 | CA86-290 |
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Unnamed and unassigned, 87.1 ft.

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| 38. | Shale, gray, to green-gray, slakes readily, many carbonaceous imprints. | 509.5 | 2.3 | CA86-1001 |
| 39. | Thinly interbedded gray and green-gray shale with sandstone, light-gray, fine-grained, micaceous; unit is calcareous in spots; carbonaceous inclusions; a few hard very-dark-gray inclusions that may be siderite. | 511.8 | 7.1 | CA86-291
511.8-515.0
CA86-292
515.0-518.9 |
| 40. | Shale, green-gray to gray, finely micaceous, minor sandstone, as above. | 518.9 | 2.3 | CA86-293 |
| 41. | Shale, gray-brown, mostly arenaceous, with sandstone banding and zones in part, fine-grained to very-fine-grained, micaceous carbonaceous flecks, slightly tilted bedding in part. | 521.2 | 5.2 | CA86-294 |
| 42. | Sandstone, light-gray, fine-grained, mostly calcareous in top 4 feet, micaceous, carbonaceous flecks; thin argillaceous laminations and some dark-gray shale bands. | 526.4 | 7.6 | CA86-295
526.4-530.0
CA86-296
530.0-534.0 |
| 43. | Shale, gray, micaceous, carbonaceous flecks, arenaceous with thin bands of micaceous light-gray sandstone; a few bands of sandstone, light-gray, fine-grained, micaceous, carbonaceous flecks, some siderite grains. | 534.0 | 1.7 | CA86-297 |
| 44. | Sandstone, light-gray, fine-grained, micaceous, sideritic in part; a few bands of arenaceous gray shale. | 535.7 | 4.4 | CA86-298 |
| 45. | Shale, gray, mostly arenaceous, micaceous, carbonaceous flecks, thin laminations of sandstone, light-gray, fine-grained, carbonaceous flecks, some siderite. | 540.1 | 3.3 | CA86-299 |

46.	Sandstone, light-gray, fine-grained, carbonaceous flecks, minor mica, a few thin argillaceous laminae.	543.4	1.0	CA86-300
47.	Shale, dark-gray, micaceous, carbonaceous flecks, flattened siderite(?) grains; thin laminae and a few bands of sandstone, as above.	544.4	1.5	CA86-301
48.	Sandstone, as in unit 46 above.	545.9	2.0	CA86-302
49.	Sandstone, argillaceous, gray, fine-grained, with intimately intermixed carbonaceous laminae and dark argillaceous material that is micaceous; siderite grains.	547.9	1.4	CA86-303
50.	Shale, dark-gray, micaceous, arenaceous, with thin laminae of fine-grained micaceous light-gray sandstone.	549.3	2.1	CA86-304
51.	Sandstone, light-gray, fine-grained, micaceous, numerous carbonaceous flecks with some vitrain, clayey sideritic(?) grains.	551.4	0.6	CA86-305
52.	Shale and sandstone laminae as in unit 50.	552.0	3.2	CA86-306
53.	Sandstone, as in unit 51 above.	555.2	0.8	CA86-307
54.	Shale and sandstone laminae as in unit 50 above.	556.0	1.3	CA86-308
55.	Sandstone, light-gray, fine-grained, micaceous, carbonaceous flecks, brown sideritic grains.	557.3	0.7	CA86-309
56.	Shale and sandstone laminae and bands; shale about 80% of interval; shale is gray, micaceous, carbonaceous flecks, arenaceous in bands and zones; sandstone is as above; some vitrain-chip inclusions.	558.0	10.3	CA86-310 558.0-563.0 CA86-311 563.0-568.3
57.	Shale, gray to dark gray, finely micaceous, some sideritic grains, several sideritic bands.	568.3	8.4	CA86-312 568.3-573.8 CA86-313 573.8-576.7
58.	Shale, dark-gray to black, finely micaceous, sideritic bands; slightly calcareous.	576.7	5.0	CA86-314

59.	Shale, gray, very-finely mica- ceous, carbonaceous flecks, minor pyrite; some sideritic bands in basal half.	581.7	14.9	CA86-315 581.7-586.0 CA86-316 586.0-591.0 CA86-317 591.0-596.6
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Alum Cave Limestone Member, 2.0 ft.

60.	Shale, dark-gray, very calcareous to limestone, dark-gray-brown, micritic, very argillaceous, numerous fossil fragments, gastro- pods, crinoid columnals, shell fragments; some fine-grained pyrite.	596.6	2.0	CA86-318
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Unnamed 1.6 ft.

61.	Shale, black, a few calcareous spots, a very thin laminae of lighter colored shale.	598.6	1.6	CA86-319
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Petersburg Formation, 83.8 ft. drilled

Springfield Coal Member, 3.6 ft.

62.	Coal, bright banded, no shale partings; pyrite bands at 601.3 and 601.5'; gas bubbling out of core.	600.2	3.6	CA86-1002 600.2-602.2 86 x 1 602.2-603.8
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Unnamed, 80.2 ft.

63.	Shale, gray, soft, irregular frac- ture, carbonaceous root imprints, calcareous in part.	603.8	3.3	CA86-320
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64.	Shale, gray, micaceous, irregular carbonaceous laminae in part, calcareous in part, arenaceous in part; 4-inch sandstone band at top, light-gray, fine-grained, micaceous, carbonaceous flecks, calcareous.	607.1	4.9	CA86-321
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65.	Sandstone, light-brown-gray becoming light-gray with depth, fine- grained, micaceous, carbona- ceous flecks, calcareous at top decreasing with depth; vertical fracture with calcite coating.	612.0	3.4	CA86-322
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66.	Sandstone, light gray, fine-grained, slightly micaceous, carbonaceous flecks, slightly calcareous in part; gray shale laminae with carbonaceous flecks at top and a few at deeper depths.	615.4	3.2	CA86-323
67.	Core loss (rock bitted).	618.6	6.4	None
68.	Sandstone and shale bands; sandstone is light gray, fine-grained, and slightly micaceous; carbonaceous flecks with very thin laminae in part composed of black carbonaceous material; shale is gray, finely micaceous, and carbonaceous.	625.0	9.0	CA86-324 625.0-629.0 CA86-325 629.0-634.0
69.	Sandstone and shale, as above; a few sideritic patches.	634.0	6.2	CA86-326
70.	Shale, gray, slightly micaceous, carbonaceous flecks, arenaceous with numerous thin laminae of fine grained sandstone; some bands and nodules of siderite; trace pyrite; calcareous in part.	640.2	5.4	CA86-327
71.	Shale, gray, many carbonaceous flecks, some micaceous zones, pyrite in part, arenaceous zones and laminae; slightly calcareous in part.	645.6	3.2	CA86-328
72.	Shale, gray to gray-brown, carbonaceous flecks, mostly slightly arenaceous but has thin sandstone laminae in places; arenaceous content decreases with depth; some tilted bedding in top 10 feet.	648.8	35.2	CA86-329 648.8-654.0 CA86-330 654.0-659.0 CA86-331 659.0-664.0 CA86-332 664.0-669.0 CA86-333 669.0-674.0 CA86-334 674.0-679.0 CA86-335 679.0-684.0

Total depth 684.0