

Mine Notes - AMAX C.C. "WABASH" - Wabash Co.

Trip: Dec. 19, 1979 by Steve Danner,
Phil DeMaris, T.L. Phillips and
Denver Harper and Don Eggert of
Indiana Survey.

General Observations

Coverage: Sampling in Beall Woods North (BWN)
Samples; Paly. samples & Set A begun

Introduction

T.L. Phillips was informed by Don Eggert that there were some coal balls where he and Denver had been working. T.L.P. invited us to get stratigraphy of coal balls & help collect samples.

At Eng. office we were briefed by Everett Hallam (draftsman) and Ed Woods (Surveyor). They indicated mining problems related to splits in seam & other causes (unknown) had occurred in the BWN area and BWSouth area, which mines east. They know they are mining toward missing coal areas, but drill holes did not suggest they would have major problems so soon. We were escorted by Ed Woods.

General Observations

At bottom area awaiting trans, examined roof; Is a highly carbonaceous shale dark gray in color, with many lycopod stems (large) and some smaller stems. Roof holds well here; rib is bolted at chest height w. about 3' header boards to prevent rashing.

BEALL WOODS NORTH ; we stopped about 5 cross-cuts short of the study sites. T.L.P. and I saw 2' wide Sigillaria stems in roof, and several large Calamites stems that were well preserved.

The track is in the east intake of a split ventilation system. Normal development is 7 entries, but now 5 or 6 in problem area, with the eastern-most one undeveloped for 6 crosscuts. The last 2-3 crosscuts before location 6571 on the track show a prominent mid-seam split nearly $\frac{1}{2}$ ' thick. Also, a prominent fault which dips west lies in the roof of the track entry for at least 20'.

Sampling in B.W.N.

A. See Map A; I painted reference marks on the W. rib of the pillar opposite the coal balls; site A is 120' south of site B & was planned coal desc. site; however a middle-angle fault dipping west has removed the lower portion of the seam. Here there is only 4.50' of coal with a regular roof contact.

B. This site is 22' south; "0" is the pillar corner. Site is roughly centered in coal balls; is close to several med-to-large coal balls but only passes through one thin one; not more than 5% thickness increase.

Desc.: shale

2.85' Coal, nbb

0.25' "Red" zone coal ball

5.10' coal, continues into floor

(Tot. 8.20' seen) (dug 3/4')

I began to develop in-seam stratig. here, but this was interrupted by collecting and not finished til Feb. trip. Aim is to establish strat. limits of normal coal which are represented as peat in coal ball zones. Coal palynology samples can then be taken to represent the same interval.

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Coal top 2.1' is without coal balls

Zone Green Top C-B zone represents adjusted coal 2.1 to 3.0' down (approx.)

Zone Red Second zone from top: 3.0' to 3.75' down

Coal marker bed; sprayed w. white zig-zag and not rep. by coal balls.

Establishment of marker bed caused some "Blue" zone c.b.'s to be remarked "Red" on the south side; T.L.P may have treated these as "Lower Red", and tabulated separately. See Feb. notes for completion of stratigraphy and palynology sampling.

C. Site C. is at 77' south on the W. rib; I was looking for a corner & got the small split as a bonus:

shale
Field # C2 - 7.10' coal; small C.B. 1 $\frac{1}{2}$ ' above split
.35' silty split, var. thickness
Field # C1 - 0.90' coal, continues into floor

D. As coal ball sampling finished up, Denver Harper & I wandered off to sample coal at a more "normal" location to the east. Here there is no split and "normal" roof as per Harper. I benched at 1.45' up because that position had traces of shale and small pyrite lenses. Coal thickness of 7.50' also w/in normal range for mine: Paly. sample

top bench	1.50'	(1)
	2.80'	(2)
	1.75'	(3)
bottom b.	1.45'	(4)

u/c, rather tough

Benches 2/3 sep. on a fusain band; bench 1/2 has occasional nodule on bd. plane.

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Samples; Sites C & D

Site c:

Palynology; Site C = Mac. 2575A, B, & C

A is composited face channel field # C3

B is 0.2' coal immed. over siltst. split

C is bottom bench, 0.9' thick

Prox. Anal for site C is C20842

Petrographic anal. is P 2159

Site C; split material sampled & labeled

WB-A-1

Site D:

Palynology; Site D = Mac. 2576 A, B, C, D & E

A is composited face channel

B is bottom bench (4), field # D4

C is the next bench (3), field # D3

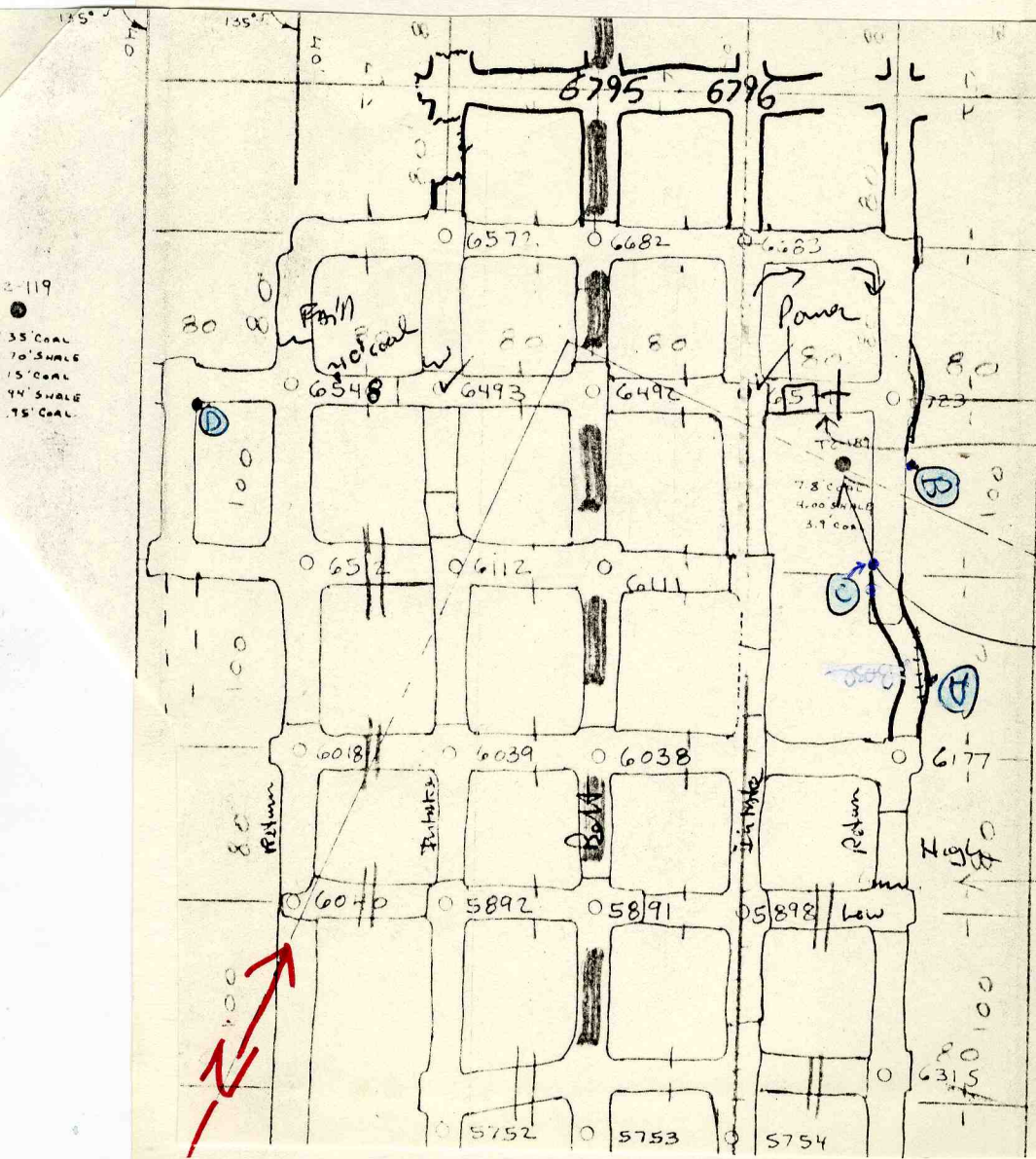
D is the next bench (2), field # D2

E is the top bench (1), field # D1

Prox. Anal for site D is C20843

Petrographic anal. is P 2160

"Wabash" 12/19/79 Map A



AMAX
 "Wabash"
 Field Map
 Dec. 19, 1979

Intense Folding
 of coal seam +
 thin up to E.

Data off
 E-logs -
 drillers log
 said "black streak"

can be walked down
 Carefully - best work
 exposure of split unit

2-119
 35' COAL
 70' SHALE
 15' COAL
 44' SHALE
 75' COAL

Mine Notes - AMAX 'WABASH' Mine - Wabash Co.

Trip: Feb. 13, 1980 by Steve Danner and Phil DeMaris, notes by DeMaris; see those by Danner also.

Coverage: Introduction
General Observations
Work in Beall Woods North, inc.
Coal-ball stratigraphy
Samples; Set B (-1 to -11)
Summary

Introduction

Purpose of trip was to define coal and coal-ball stratigraphy at site B., and then sample the coal for both Palynology and petrography. We also wanted to examine some of the coal-to-split (material) contacts with an eye to establishing east-west coal stratigraphy near the sample areas. Steve had some time for this, but much needs to be done.

When I contacted Dana Meier, Eng., he indicated that the #5 entry (track) was back in thick coal. A mid-seam Ss. split is now present at the face, with "nodules" (found to be coal balls later) in the coal over this split. Meier escorted us in the mine.

General Observations

We went underground at 9:20. I had planned to sample the lower bench of coal in BWN but this didn't happen. Due to trans. problems we looked at the lower bench in the BWE area; it was sampled just into (S.) the crosscut at tag # 3677. The split thickens rapidly to the east; it is interfingered slightly (depositionally) with the top of the lower bench. Top 0.9' of bench was sampled, with $2\frac{1}{2}$ ' of coal seen (more into floor (sample -B-9)).

Continuing N. (I believe) toward cross-fault area in BWN, we graded above lower bench (sample on next trip), then passed a thin mid-seam split. The lower bench was exposed at the cross-fault area (See fig. 7, circular 509), as is another coal bench at 4-5' above main seam (seen in roof fall). Sampling opportunities are good & help for stratigraphy is given by these faults.

Work in BWN: inc. coal-ball strat.

Arrived at 10:30. See map A for site locations.

- E. Fault in roof goes into pillar. Dark shale is roof, locally with coal riders. Piece of v. dk. gray roof shale sampled, shows compactional (?) slips (-B-10).
- F. Coal balls about 1' above Ss. split. Ss. from the middle of the split material was sampled (-B-11)
- G. Coal ball with nice preservation above Ss. split, which is 0.6-0.8' thick. One coal ball high in rib has incorporated in it angular pieces of fusain lying at high angles to bedding. Sample this one later.
- H. At the working face, tag # 7141, coal balls were seen high in the seam. Irreg. contact to shale roof which contains Sigillaria compression.

Return to site B.

B. is defined by a vertical yellow line from first trip. I dug a little more floor on the chance we were close to exposing all

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of the coal; no luck. Roof here is dk. gray shale with many fine coal stringers; no plant compressions were seen and a thin coal bench exists about 2 feet into the roof, with a gradational lower contact. This bench is bolted into roof locally; could see only 0.3' max. and it was shaley coal. On the base of the coal I saw a 10' long segment of a stem (Lycopod) about 3' wide. Examined thin high bench further; on W. rib it is impure and about 1' thick, and also has gradational top (to carb. shale). This bench rides "up" to the east and is only 1.2' above main seam in crosscut to W., near door on S. rib. As noted floor not found (base of seam); total thickness avoiding most C.B.'s is 8.3' w. more in floor, although prob. not too much judging by nearly drill hole.

I examined the coal balls & derived comparable coal-with-coal-ball and paly./petrog. zones. These picks supercede those made in Dec. (SEE NEXT PAGE).

Note that Orange and Yellow coal-ball zones are combined for coal sampling. The only Orange C.B. left in face is well below a siltstone parting which elsewhere marks the top of the Orange zone; however a prob. Orange C.B. is just above this siltstone. The remaining Yellow C.B.'s in face fall in the Orange interval. The Orange zone and Yellow should be combined; Yellow zone C.B.'s have been sampled from the Orange zone as best as I can tell. Potential for resampling exists; to extend strat. to south would take some effort, but Green zone and perhaps higher C.B.'s could be sampled. All of "Blue 5" coal sample is within 1' of coal balls- this may effect reflectance values.

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<u>Coal & C.B. Zones</u>	<u>Coal Samples</u>	<u>Other</u>
	<u>Name/#</u>	<u>Thickness</u> <u>#'s</u>
(top coal)	<u>Top 1</u>	1.90'
<u>Green CBZ</u>	<u>Green 2</u>	.85'
<u>Red CBZ</u>	<u>Red 3</u>	.85'*
(coal)	<u>Coal 4</u>	.40'
<u>Blue CBZ</u> (twin, thin, micaceous siltstone ptngs)	<u>Blue 5</u>	1.65'
<u>Orange/Yellow CBZ</u> (fusain band near base)	<u>O-Y 6</u>	1.30'
(coal)	<u>Coal 7</u>	1.40'
		<u>8.35'</u>

Summary

* excluding (coal of) a
0.25' thick coal ball.

A small group of random coal balls were collected for T.L.P. at end of shift; most were from above the mid-seam split toward the working face (none for B.); Steve saw one C.B. pressed into the split material. On the next trip we need a coal sample from the lowest bench in BWN.

Roof compressions also interesting; on track at turn into BWN saw a Calamites stem nearly 6" from node to node, and over 6" wide.

I spoke to Dana Meier at length about the split coal area and indicated a long-term interest in the problem. Promised a prelim. report on flora when available. (In the event the Sulfur data was passed on to Dana also)

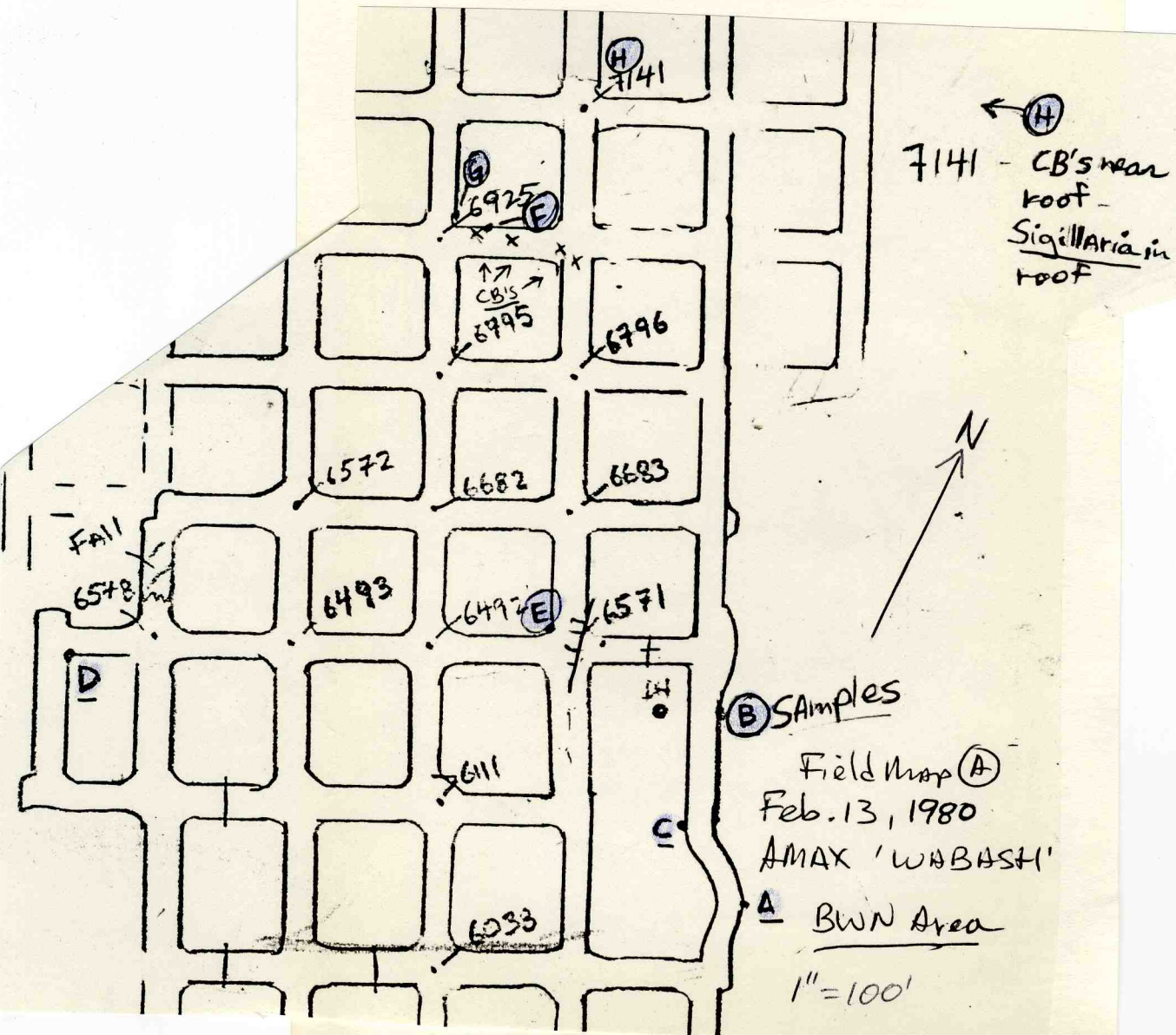
Samples

- WB-B-1 to -7 Site B; 7 coal samples at coal-ball site for palynology & petrography. See p. 4.
- WB-B-8 Site B; Coal off the base of a large coal ball (within 0.1') for S isotope work by Tom Anderson/Linda Chapman.
- WB-B-9 Beall Woods East; top of lower bench (Split is not at same level as in BWN). In crosscut immed. south of tag 3677; top 0.9' sampled from a minimum of 2 $\frac{1}{2}$ ' coal present here.
- WB-B-10 Site E; highly slickensided very dark gray roof shale- near compactional (?) faults.
- WB-B-11 Site F; sandstone from the middle of the split material (less pyritic).

Note: A small collection of random coal balls was gathered for T.L. Phillips. (See Danner's notes)

(Sample WB-B-8 was split between a pellet *P2187* and the sealed portion sent to Dr. T. Anderson*)

Map (A) 2/13/80



AMAX Coal Co.

Wabash Mine

Wabash County

Feb 13, 1980

Notes by Steve Danner; accompanied by Phil DeMaris,
another ISGS geologist.

Purpose of visit was to collect bench samples of
coal from coal ball horizons. Sampling
conditions were good.

General observations from Beals Wood North:

Stop #1: Intersection #6925 (see map)

The roof here is primarily a gray shale with
some top coal. No noticeable jointing; occasion-
al E-W trending post-mining fractures.

The rib at the north corner of the inter-
section consists of approx 12' of coal
separated by an 8 inch band of light to med
gray sandstone. At the corner the band is
almost 6' below the shale roof; moving NE
along the entry, one can see the SS band climb
gradually in an undulating fashion. Approx
30' beyond the corner the band pinches out in
the coal, 3' below the shale.

The gray sandstone (SS) varies in grain size
from medium sand to silt, the majority of the
grains falling in the very fine sand bracket.
No real bedding is evident, although faint
lamellae of carbonaceous debris and mica flakes
can be seen occasionally. The sandstone also
contains numerous coaly streaks, stringers, and
rafted fragments. Being dense, massive, and
well-cemented, the SS tends to break in ir-
regular, sharp-edged blocks, often along a
coal lamina or a plane of concentrated mica
flakes.

Due to the way the SS interfingers with and

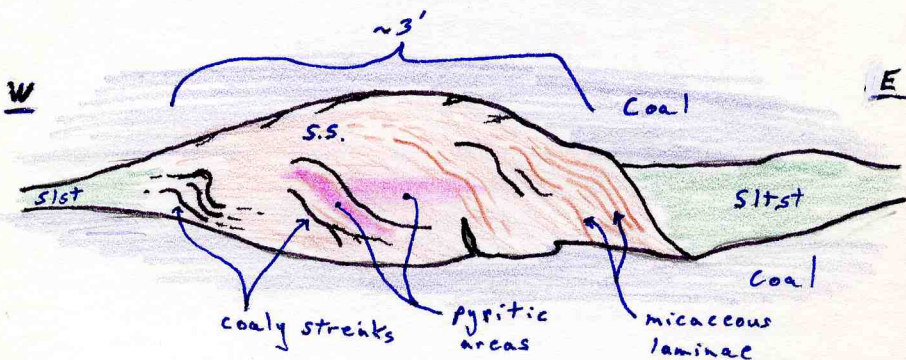
separates the bands of coal, it would appear that this is an injection sand of some sort.

NW corner of intersection #6925:

Less than $\frac{1}{2}$ " of sandstone remains; it inter-fingers with two gray shale partings, each 1" to 2" thick. These partings are separated by 3" of N.B.B. coal. A 1" band of fusain lies immediately below the lower shale parting.

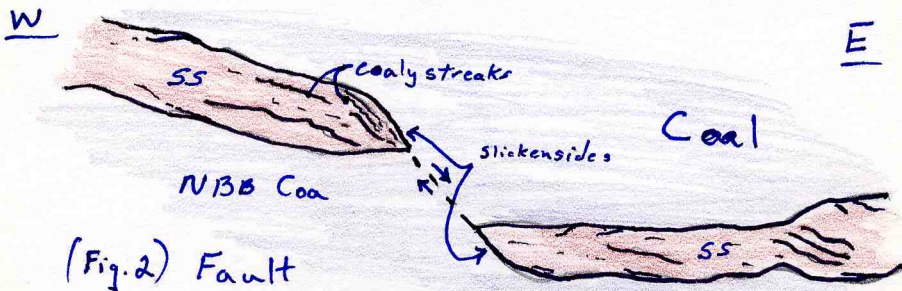
South corner of #6925:

About 4' below the shale roof lies a pod of the gray sandstone. The trails and laminae of mice and carbonaceous materials exhibit a convoluted fabric. This body has definitely undergone some sort of soft-sediment deformation. The pod tapers at both ends and gradates into a dense gray siltstone. At the west end the siltstone pinches out about four feet from the pod; at the other end the siltstone tapers to a $\frac{1}{2}$ " to 2" band that gradually undulates downward. (see sketch)



Sandstone Pod (Fig 1)

Stop #2: Crosscut east of intersection #6925. About 25' east of the intersection the sandstone body is offset by a normal fault with approx 1.5' of vertical displacement. The sandstone, like before, is relatively clean with only micaceous laminae and coal stringers and streaks; the fabric has a convoluted appearance. The fault plane is slickensided, but there is little or no clastic debris. It should be noted that the fault is contained within the coal seam, dying out a short distance above and below the sand body. Similar displacement is manifested across the x-cut in the north rib. The coal seam tends to undulate gently in this crosscut.



Stop #3: Entry SW of intersection #6795. There is an irregular band of coal balls in both ribs, approx 4-5' below the gray shale roof. The coal balls appear extremely pyritic.

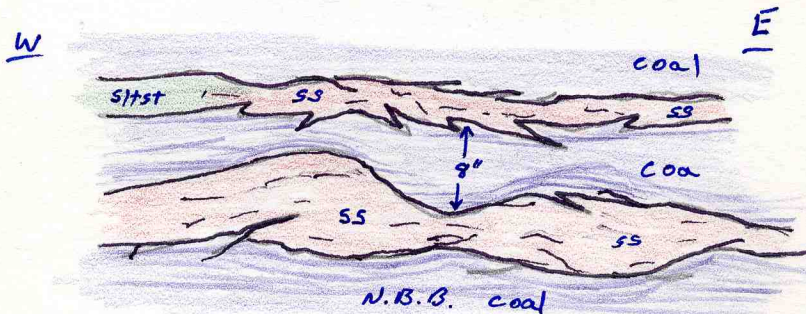
Stop #4: NW of intersection 7141. Two feet below the shale roof are several coal balls, very pyritic containing calcite veins and numerous fusain clasts.

Stop #5: Face immediately NE of 7141.

Two feet below the gray shale roof lies a band of coal balls. These balls seem to have an unusually high amount of fusain within them. The fusain appears as random clasts, lenses, and bands. The sandstone again appears as a band 4-18" thick across this face. It is massive, fine-grained, and well cemented.

Stop #6: South corner of 7141.

Two bands of sandstone split the coal near the middle of the seam. The lower band is comprised of intermittent lenses that are roughly 8" thick and 1' long. The two bands are separated by as little as 2", and as much as 8", of N.B.B. coal. The upper band is a mixture of siltstone and sandstone interfingering with stringers of coal. Contains some finely disseminated pyrite as well as the usual mica and coal laminae. Coal banding either butts up against sand lenses or drapes over them. (see sketch)



Wednesday, November 2, 1983

Visit to Amax Coal Co. Coal Division Headquarters:
105 South Meridian Street, Indianapolis, IN 46220

Notes by D. K. Lumm, I.S.G.S. with John Nelson,
I.S.G.S.

Purpose of visit is to talk about AMAX's possibility of opening a new underground mine in eastern Williamson County, Illinois. Their leased area lies adjacent to the Cottage Grove Fault System in T. 8, 9 S., R. 4 E.

We met with Mr. Keno W. Koehl, Senior Planning Engineer, and Mr. Robert J. Reynolds, Senior Geologists.

Keno gave a paper at the recent Illinois Mining Institute in Springfield entitled "Mining Across the New Harmony Fault, Wabash County, Illinois." We went through the slide presentation again.

Stratigraphy adjacent to the fault, from top to base, is:

- *NG Herrin (No. 6) Coal
- underclay
- 9' sandstone
- 10' Big Creek Shale
- 12' Vermillionville Sandstone
- 21' Canton Shale
- NG Briar Hill (No. 5A) Coal
- 32' "5330 Sandstone" (computer name)
- 44' Dykersburg Shale
- NG Springfield (No. 5) Coal

*NG = not given.



FORM 180 W

- 2 -

Main fault is a high angle normal fault with displacement down to the west. Three smaller high angle faults having displacements less than 15 feet each occur east of the main fault. These were mined through. Faults trend roughly NNE.

Two return, intake, and neutral slopes (6 total) have been developed down to the Springfield (No. 5) Coal. The company's 20-year plan shows future developments mostly south and east of the fault on the upthrown side and to the west on the downthrown side. Coal is being sold to the Gibson Station, IN power plant.

John produced a confidential drill hole map of AMAX's drilling in eastern Williamson and western Saline Counties. The master fault of the Cottage Grove trends WNW where AMAX has interested mining developments. Vertical offset varies from 100-200 feet and is down to the north. Structural contour mapping at intervals of 10 feet show closures of anticlines and synclines. Subsidiary faults trending NNW or NW may exist but have not been confirmed.

Bob showed us his company map of the same area having more drill holes but basically showing similar features. Bob said that John could obtain the additional drill holes by submission of a formal request.

In general, the area of least structural complexity occurs north of the master fault. Bob declined to say whether or not another underground mine was seriously being considered by AMAX management.