

## Black Beauty Coal Company - Wildcat Hills Mine - Saline County

Notes by John Nelson with Scott Elrick, July 23, 2008

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This is a highwall drift mine in the Herrin Coal. Workings overlie those of the active Willow Lake Mine, in the Springfield Coal. Main entries run northeast and northwest from the portal. There is currently one working unit, which we did not visit.

The coal appears to be quite uniform in thickness, although I made only one measurement. In Main North travelway at crosscut 30 the coal is 4.9 feet thick, with a pyrite lamina 0.9 ft from the top and claystone "blue band" 0.1 ft thick at 1.35 ft above the base. Regionally, the coal dips north, but the dip is not apparent in the mine. The coal is level or gently undulating.

Roof consists of pods or lenses of gray Energy Shale, sharply overlain in turn by Anna Shale and Brereton Limestone. The Energy Shale ranges up to at least 10 feet thick; new overcasts at the 2<sup>nd</sup> West-Submains North junction show 8 to 10 feet of Energy with the top not visible. Energy Shale is medium-dark gray, slightly silty, and weakly fissile. Coal laminae and stringers are present. The gray shale weakens on exposure to mine air and falls out between the roof bolts. All of the large roof falls we saw were in Energy Shale. Anna Shale makes competent roof.

We were given a map of the entire mine, showing areas where the Brereton Limestone is thin or absent. Nearly all the roof falls occur in such areas. The pattern of thin or absent limestone is patchy and seems to be random.

An igneous dike that trends slightly west of north crosses the mine workings. We viewed it where it crosses the Main North travelway at crosscut 50, and in several adjacent headings. A heavy coating of rock dust hid the details. On the travelway, the dike is about 5 feet wide in the coal and appears to maintain its thickness into immediate roof and floor. The intrusive rock is brownish gray and very fine-grained. Lateral margins with the coal interfinger on a small scale. Coal is coked in a zone 2 to 3 feet wide along both margins. Closely spaced vertical fractures accompany and run parallel with the dike. There is no fault; no vertical offset of the coal.

On return-air entries northwest of the travelway, the dike is a little wider in the coal than in the roof and floor. Small dikes a few inches wide appear in places close to the large dike.

We had much better view of dikes yesterday in the Willow Lake Mine.

Our guides called attention to a zone of "aligned" roof falls parallel with and about 1,000 feet east of the dike. These falls were suspected to be related to a fault or dike that was encountered in the Springfield Coal at Willow Lake, but not observed in the Herrin Coal.

I had a look at roof falls in the intake-air entries, east of the travelway near crosscuts 60 to 64. This is an area of thick Energy Shale. In one place a large roof fall occurred and was not cleaned, a set of steel arches placed beneath. Looking into the fall, the section is as follows:

- 15' Siltstone or sandstone, thin planar bedding ("stack rock"), many bedding surfaces black.
- 0-1' Brereton Limestone, lenticular

2' Anna Shale  
5-6' Energy Shale  
Top of coal.

No faults, aligned fractures, or kink zones were observed in the area. On the belt entry, the roof is supported by tightly packed cribbing and there is standing water on the floor. Again, no aligned fractures or kinks were seen.

The zone of "aligned" falls continues on the 2<sup>nd</sup> West Entries. A fall blocks the intersection of the travelway and crosscut 15. Strata seen here are:

TOP - light-colored flat surface, base of sandstone or limestone  
15' Shale or mudstone, dark gray, bedding indistinct  
0-1' Brereton Limestone, lenticular  
2' Anna Shale  
5-6' Energy Shale  
Top of coal.

No fractures, faults, or evidence of in situ stress.

Based on limited observations, we conclude that the roof falls are related to incompetent Energy Shale and thin or absent limestone, and not to structural features or in situ stress.

This was not a good mine for geologic observations. The workings are new enough that just about everything is covered with rock dust. Low coal height (5 feet) discourages long exploratory hikes; several areas we wished to see would require long walks and are said to be difficult to reach.

### Box Cut

The portal of Wildcat Hills is in a box cut, which I believe is actually the final cut of a pit in the Cottage Grove surface mine. Location:

The following section was measured at the northwest end of the highwall.

Top - Quaternary sediments, largely grassed over, not examined.  
3.5' ± Piasa Limestone, medium-light gray, weathers orange-brown, microgranular with scattered fossils including crinoid columnals and large, whole productid brachiopods such as *Dictyoclostus*. Massive to nodular, dolomitic, argillaceous (especially at top). Lower contact sharp and undulating.  
7.5' Shale, medium-dark gray, slightly silty, moderately fissile, calcareous. Abundant siderite nodules and concretions (estimate 10% by volume), mostly 0.1 to 0.3 ft across. Siderite nodules form a nearly continuous band 2 feet above base of unit. Lower contact gradational.  
2.3' Shale, grayish black, thinly fissile, non-resistant to erosion, weathers to small chips. Strongly calcareous, contains large (to 0.5 ft) spheroidal or ovoid concretions of dolomitic limestone near the base. Lower contact sharp.

- 0-0.6' Dolomite, grayish-black, weathers gray or rusty brown, microgranular. This layer composed of flattened ovoid or disc-shaped concretions as large as 3 feet in diameter (on horizontal axis), in some cases concretions overlap one another. Contacts are sharp.
- 0.7-0.9' Shale, like that above the dolomite. Lower contact rapidly gradational.
- 1.2' Shale, black, hard, highly fissile, "slaty", not calcareous or slightly so. Resistant to erosion. Contains small dark-colored nodules less than an inch across, phosphatic? Unit sampled for conodont study. Lower contact sharp.
- 0.4' Shale, like next-to-last unit. Lower contact gradational.
- 20' Shale, medium to medium-dark gray, slightly silty, moderately fissile. Continuous bands of siderite 0.1 to 0.3 ft thick are numerous. In the lower half of the unit these are even spaced about one foot apart.
- 5' Covered, probably about 3 feet of shale overlying 2 feet of Danville Coal, as observed previously in nearby active surface mine. Lower part of the coal is exposed, but badly weathered.

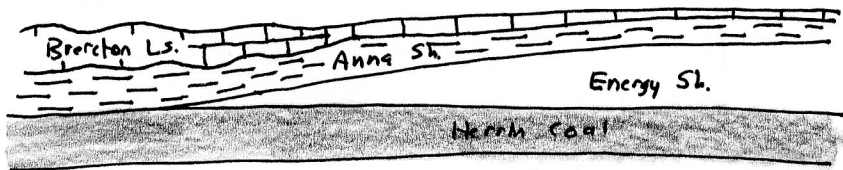
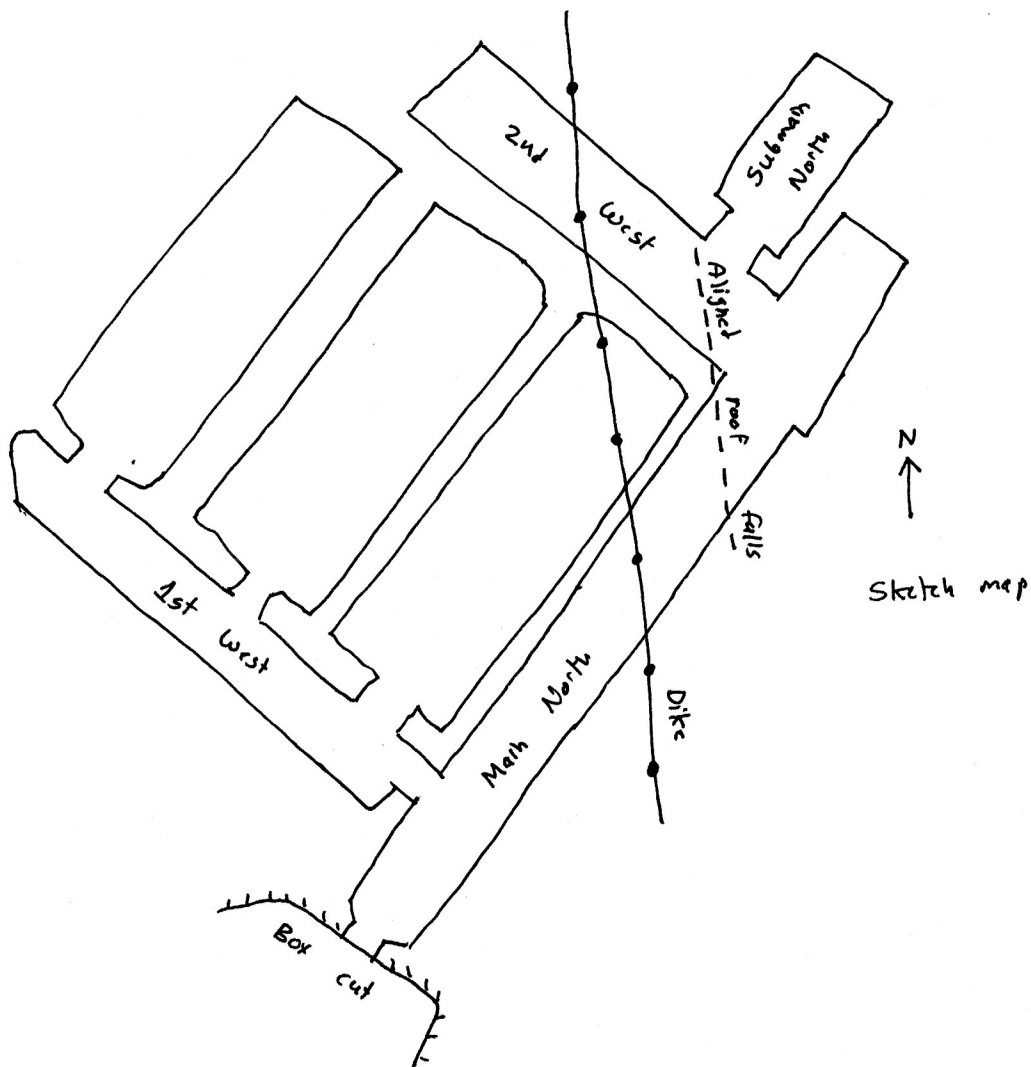
The following strata were mostly estimated from a distance.

- 10' Claystone, gray to olive-gray, upper part blocky and pyritic, rooted(?), lower part inaccessible, contact sharp.
  - 3' Sandstone, yellowish to olive gray (weathered), massive except a few partings, lower contact sharp.
  - 2' Shale, dark gray, non-resistant.
  - 1' Coal (Allenby or Baker)
  - 5' Claystone, resembles underclay, non-resistant.
  - 5-7' Bankston Fork Limestone, medium gray, weathers light brownish orange, microgranular, dolomitic, contains broken brachiopods, observed as fallen blocks. Upper contact irregular and may represent an ancient weathering surface. Lower contact sharp and undulating.
  - 5' Shale, dark gray, non-resistant.
  - 7' Sandstone, gray with rusty stains, somewhat shaly, thin- to medium-bedded, lower contact sharp.
  - 10-12' Shale and sandstone interlaminated, overall fining upward from a sharp lower contact, sandstone content decreases toward the east. Lamination is planar, highly rhythmic, with definite neap-spring tidal bundles, as observed in fallen blocks. Lower contact sharp.
  - 6-7' Mudstone, gray to olive-gray, bedding weakly developed to absent, incompetent, lower part dark gray, possibly includes Jamestown Coal horizon.
  - 0-4' Brereton Limestone, medium gray, more or less massive. Piches and swells markedly, both contacts sharp and rolling.
  - 2-3' Anna Shale, black, hard, fissile, large ovoid calcareous concretions.
- Herrin Coal.

At east end of box cut a wedge of Energy Shale comes in between the Herrin Coal and Anna Shale. The Anna sharply overlies this (probably erosional contact), and the Anna thins slightly as the gray shale thickens. The Brereton Limestone thins to

about one foot but is nearly uniform thickness above the gray shale.

Wildcat Hills Mine - 7/24/08



East end of box cut