

Col No. _____ County _____
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KEY SHEET

Case	Name	Dept.	Thr.	Res.

T R R W		Contained by _____	
		Date _____	
		County _____	

0 1 2 3 4 5 6 7 8 9

Black Beauty - Willow Lake



FORM 180 W

Black Beauty Coal Co. - Cottage Grove Mine, Gallatin and Saline County, Illinois. Notes by John Nelson with David Moore and Scott Elrick, August 31, 2005.

This was a brief visit. Currently two pits are active. We go first to the one west of S.R. 142 and southeast of Willow Lake portal, **NE $\frac{1}{4}$, Sec. 12, T9S, R7E.**

There is no place to measure a detailed section so I'll settle for an estimated one. See next page. The pit runs NE-SW and is about 800 feet long, advancing southeast. Coal dips slightly to northeast.

We collected three large cubic blocks of coal for a lab in Australia.

Our guide reports no faults or igneous rocks presently exposed.

On upper bench about 7-8 feet of loess overlies 7-8 feet of gray diamicton. Several huge boulders of micritic limestone rest on the bedrock surface. These are probably Bankston Fork Limestone shoved a short distance by the glacier. Surficial sediments are extremely sloppy. This area received 3 $\frac{1}{2}$ inches of rain yesterday from the passage of Katrina, the great hurricane that devastated New Orleans.

Eastern pit - **W $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$, Sec. 6, T9S, R8E.** Here 35-40 feet of surficial sediments overlie 40 to 50 feet of bedrock above the Herrin. The Danville Coal, about two feet thick, is present in places and is mined where available. The pit is advancing eastward and the strata dip gently north or northwest. Bankston Fork is at bedrock surface to south; Danville Coal or overlying shale to northwest. Uppermost strata are not visible from the pit floor.

The Brereton Limestone is discontinuous and overlies zero to two feet of Anna Shale. The Anna Shale position tends to be covered with talus. Where Brereton is absent, dark shale (Anna?) as thick as six feet is overlain by a band of flattened septarian limestone concretions about half a foot thick. I believe the concretions represent the Conant Limestone. The concretionary layer appears to merge into the top of the Brereton and disappear.



FORM 180 W

At the southern end of the pit there are three depositional sequences in the Lawson/Anvil Rock, each with erosional contact on the unit below. See sketch.

After our return from the pit, mine officials reported tree stumps and *Lepidodendron* logs occur in shale a short distance below the Danville Coal.

Black Beauty Coal Co. - Willow Lake Mine
Notes by John Nelson, July 15, 2003
with Penny Padgett of Black Beauty

Willow Lake is a slope mine in the Springfield (No. 5) Coal. It has been open less than two years, but already a substantial area has been mined out. Last year the coal production was more than 2 million tons. As of today they are operating 5 units or sections, each with two continuous miners, four shuttle cars, and two roof bolters. Pillars are not pulled. Coal haulage is via conveyor belt, diesel-powered machines move men and materials. The mantrips drive up and down the main slope. Two air shafts are fitted with cages for use in case of emergency.

I made a brief underground tour with Penny Padgett and two professors of mining engineering from the University of Kentucky. They are performing tests of the strength of the roof strata in mines throughout the Illinois Basin and Northern Appalachian coal fields. The tests are performed in holes drilled into the roof by the roof bolting machine. At Willow Lake, they tested one 12-foot borehole in No. 4 Unit, which is currently the northernmost working of the mine. A device is inserted into the hole, having a pin which is forced against the side of borehole. The operator works a hydraulic jack, monitoring a pressure gauge and gradually increasing the pressure to force the pin against the rock until the rock breaks. The pressure at which the rock fails is then recorded. Readings are taken at intervals of 4 to 12 inches along the length of the hole. In this case, the St. David Limestone was clearly evident about 3 feet above the coal; it had a breaking strength in excess of 4,000 PSI compared to 1,500-2,200 PSI for shales above and below (my numbers are approximate and from memory).

While the rock-strength test was being performed I made a quick inspection of the working faces. The Springfield Coal measured 4.3 to 4.8 feet thick. Because of heavy rock dust coating, I did not have opportunity to observe detailed structure of the coalbed; but there were no obvious partings. The floor is gray, slickensided claystone. The immediate roof in most places is the black, fissile Turner Mine Shale. It has well-developed joints that trend approximately east-west and are spaced several to the foot. I

am told that the east-west joint orientation prevails throughout the mine. Lenses of Dykersburg Shale are present. Where freshly exposed, this is dark brownish-gray and faintly laminated, containing lenses of pyrite and numerous pectenoid pelecypods. The Dykersburg does not hold well in the roof, and generally is taken down with the coal during mining. I was told that lenses of Dykersburg are more numerous in the western part of the mine, and reach maximum thickness of about 3 feet.

According to Penny, the St. David Limestone is commonly a competent layer about one foot thick, but in places it is absent or grades to shale.

I did not observe any roof falls during my visit, not even in passing while riding to and from the face.

The mine has encountered an igneous dike that strikes slightly west of north. This is one of a swarm of such dikes that accompany the Cottage Grove Fault System. We had a look at the dike where it crosses the Main North Entries; unfortunately little detail could be seen because of the heavy coating of rock dust.

The best exposure of the dike was at Crosscut 74 in the easternmost return-air entry. Here the dike is about 11 feet wide (scaled off from a diagram made by Penny) and its margins are more or less vertical. It strikes N 15 W. The coal is coked on both sides of the dike out to about 5 feet from the margins. Penny says the coked coal zone is usually about half the width of the actual dike. In the roof, planar and steeply dipping fractures run parallel to both margins of the dike. Several of these bear vertically plunging slickensides, but they have little, if any displacement. Also, no offset of the coal across the dike is evident.

A lens of Dykersburg Shale is exposed close to the dike. The Turner Mine Shale overlies the Dykersburg with an erosional contact: horizontal layering in the gray shale is truncated by the inclined base of the black shale.