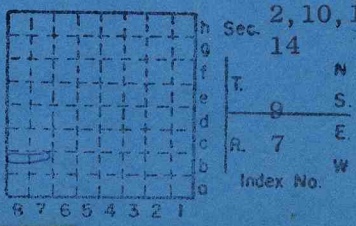
EQUALITY MINING CO. NO. 1

MINE INDEX NO. 983

HERRIN

Strip Mine



Saline County

EQUALITY MINING CO. NO. 1

(Sheets) COAL PRODUCTION (Sheet)

Period Mo. Day Year Mo. Day Year	Tons	
First reported production July, 1978.		
1978	89	383
1979	189	978
Gen Supt Charles Maloney		
1980	240	601
RR 2 1981	241	265
Harrisburg 1982	295	613
1983	103	856
1984	342	615
618-276-4738 1985	216	251 ← idle 10/85
1986	397	300 reopened
1987	583	393
1988	555	820
1989	622	267
1990		

abd 1990?

SUMMARIES

No. to No.

Railroad, Wagon, Strip, Idle, Abandoned

IDENTIFICATION

County No.

Coal No. 6

Coal Report No. L 134

Quad. Rudement & Eldorado

County Saline

Sec. 11

T. 9 N. S.

R. 7 E. W.

Index No.

h g f e d c b a

8 7 6 5 4 3 2 1

COAL MINE—PRODUCTION

ILLINOIS GEOLOGICAL SURVEY, URBANA

(2732—2M—7-41)

EQUALITY MINING COMPANY NOVEMBER 7, 1978

Notes by John Nelson on visit with John Popp.

Small strip mine in the Herrin (No. 6) Coal, located just east of what remains of the village of Cottage Grove. Highwall runs east-west and faces south. It lies just south of the county road, along the north line of the SW¼ SW¼ Sect. 11, T. 9S-R. 7E.

This is the same company that operated the Big Ridge Coal Co. mine several miles southwest of here. That mine is now finished and the surface is being restored.

The coal seam has a thick shale band, about 0.1' thick, about 1.2' above the base of the seam. The band probably is the "Blue Band". It is black, carbonaceous shale, darker than the usual "Blue Band". Total thickness of the seam is 4.5 feet. The coal is highly pyritic, with many lenses of pyrite and also pyritic cleat filling both above and below the shale band. The cleat is poorly defined. Only a few measurements were taken:

Face Cleat	Butt Cleat
133°	063°
145°	
155°	
149°	

The coal that was studied was at the back of the pit, partially buried under spoils. So much dirt is slumped over the highwall that no complete exposures of the coal seam are available there. The following is an estimated section of overburden materials:

TOP

5-10' Surficial materials; orange-brown mottled silty clay for the most part. This is removed by scrapers and stockpiled separately, in order to be replaced on top of the rock after mining is complete.

15' Shale, medium gray, thinly laminated, with numerous brown bands. Apparently sandy near top. Upper half of unit is deeply weathered.

4.3' Limestone (Brereton), medium gray, fine-grained, massive to coarsely nodular, contains crystalline patches. Widely spaced vertical fractures trend about 160°.

2.3' Shale (Anna), black, fissile, "slaty".

4.5' Coal (Herrin No. 6).

The mine is located less than half a mile north of the Cottage Grove Fault, which was first identified in this area from coal test drilling. However, no faults or other signs of tectonic disturbance are visible in the pit, and the coal lies nearly level.

The pit boss told us that a fault was encountered during earlier mining. The fault extended from the crop line of the coal (south of present pit) in a northwesterly direction. The coal was upthrown about 4 feet on the southwest side of the fracture. Also, the coal reportedly was shattered near the fault.

Saline County
Equality Mining Company
November 7, 1978

Notes by Popp on a visit with C.J. Nelson.

This is a small operation located in the SW¼, SW¼ Section 11, T.9S., R.7E., on the Rudiment 7.5' quadrangle map.

The pit is operating in the Herrin (No. 6) Coal, and Anna Shale and Brereton Limestone directly overly the coal. There is no good exposure of the entire coal but it appears to be 4-5 ft. thick.

This is the same outfit that mined at Big Ridge southwest of here about 3 miles, but the name was Big Ridge Coal Comapny. The Department of Mines and Minerals list Equality Mining Comapany as having three pits. In fact they have three permits: one for Big Ridge, which is now being reclaimed; this is the second and the third hasn't been opened. This mine is small and is operating with one diesel dragline, one coal shovel, 2 scrapers, several dozers, and miscellaneous support equipment.

The pit is practically at the location named Cottage Grove although there aren't any permanant houses here. The Cottage Grove Fault should trace through just out of the pit. The superintendant reports a small fault trending northwest was present in the pit. We did not see the fault, but it may represent a tributary fault to the master fault of the Cottage Grove Fault System.

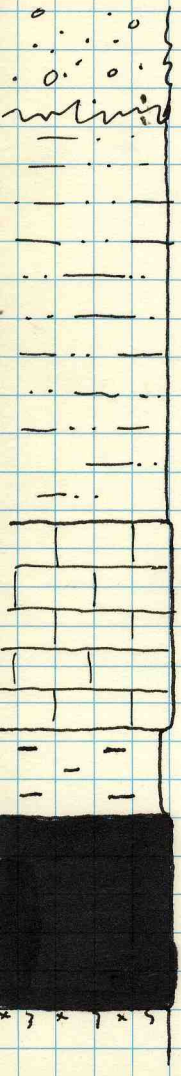
D.K. Lumm

View of highwall in active (west) pit of Equality Mining Company. Notice large white boulder, turned u up on end, in orange-brown clay just above top of bedrock. This is possible evidence of glaciation here, south of the generally-accepted limit of glaciation.

MN-32-002.tif

EQUALITY MINING COMPANY

SALINE COUNTY
November 7, 1978



Surface, soil and unconsolidated, ~4-5'

Lawson Shale, 10'+, medium gray shale, at bottom with upper few feet either weathering or becomes sandy or both.

Brereton Limestone, 4.3-5.0'

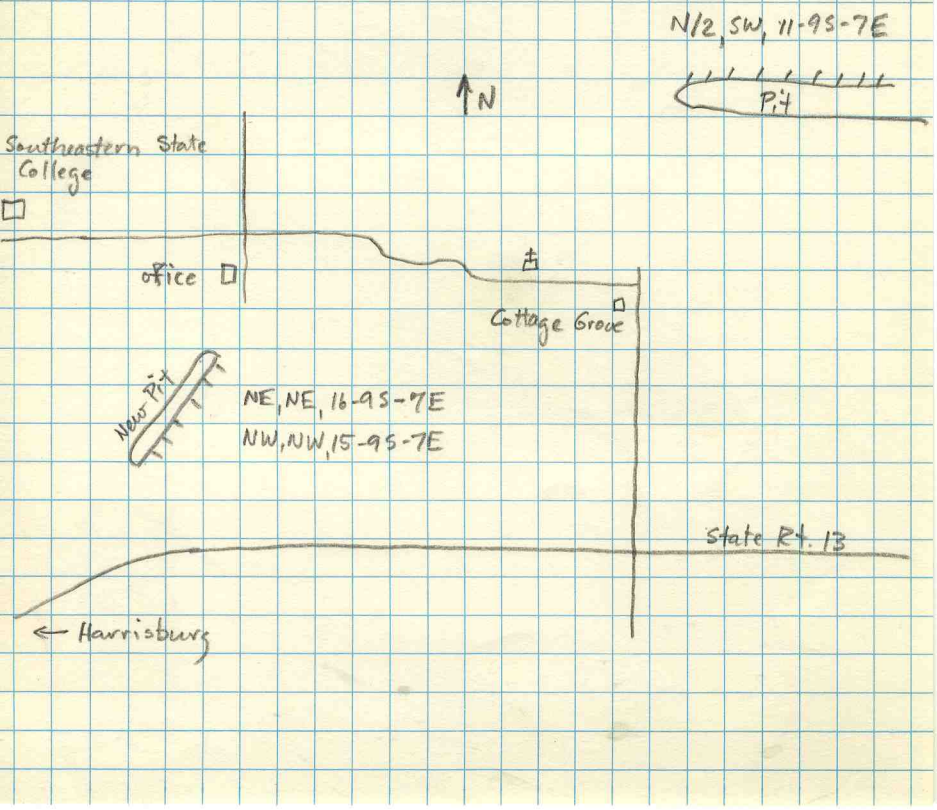
Anna Shale, 2.3'

Herrin (No. 6) Coal

Equality Mining Company
Saline
~~Gallatin~~ County

October 31, 1979

The following is a sketch map of the pits that Equality Mining Company is operating. Chuck Malone is the company's authority.



EQUALITY MINING COMPANY SALINE COUNTY

February 27, 1980

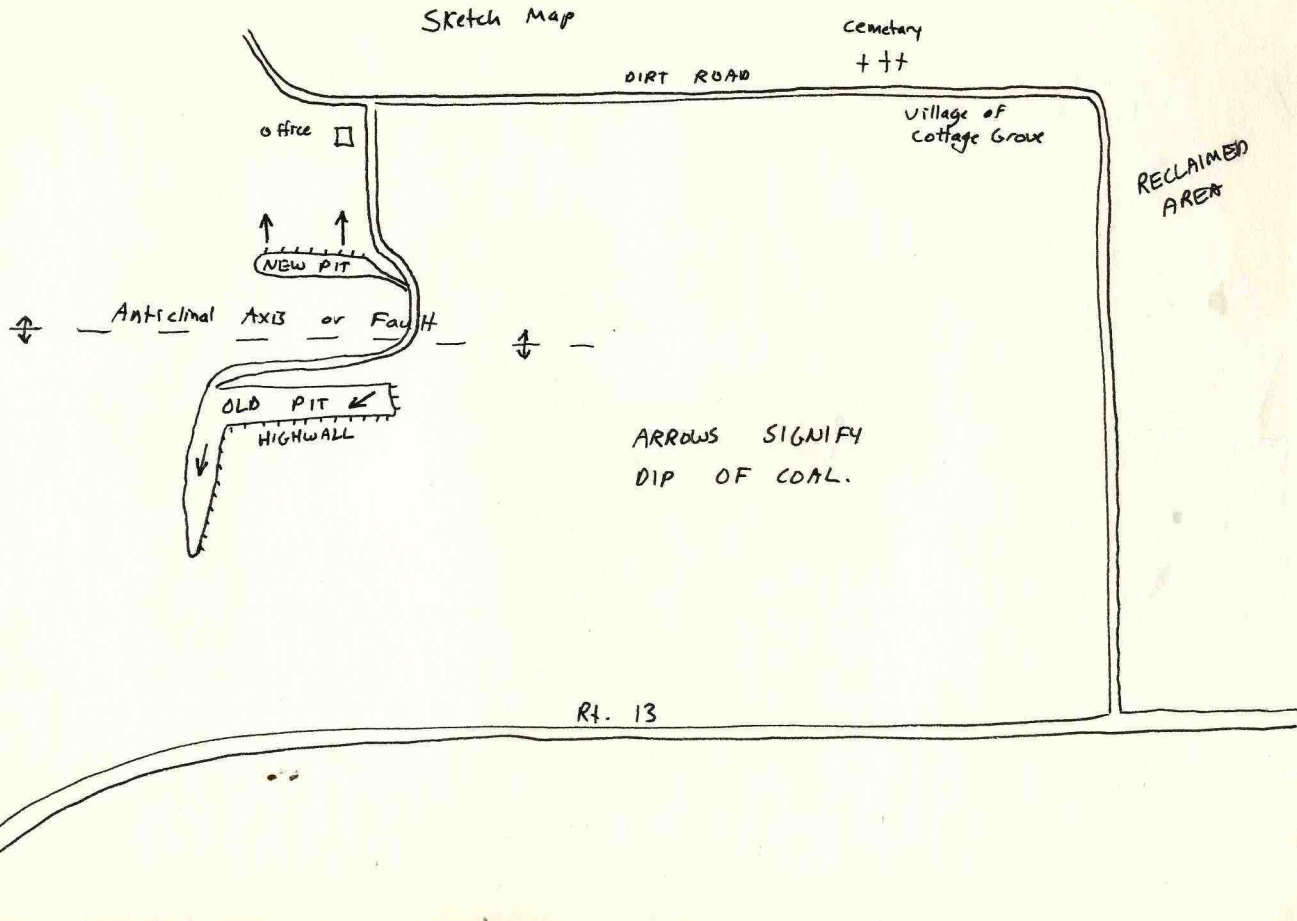
Notes by John Nelson on visit with Steve Danner.

There are two separate pits, an inactive one being reclaimed in the NW¼ NW¼ Section 15, and a new active one in the SW¼ SW¼ Section 10, T. 9S-R. 7E. The old pit is L-shaped, with the south-trending arm mostly backfilled, and the east-trending arm still showing coal and overburden. They were working in this pit last fall. See sketch map.

At the east end of the L-shaped pit the overburden is very soft, and it is nearly impossible to tell bedrock from surficial materials. It does appear that most of the highwall is composed of deeply weathered shale, about 25 feet thick. Below this is a zone of large boulders of Brereton Limestone in a matrix of soft material. The youngest unweathered bedrock is the Anna Shale, less than a foot thick and directly on top of the coal. The coal itself contains abundant white to yellowish-brown oxidation products, and for this reason we did not sample it.

Measured section of coal:

0.63'	Coal, N.B.B., blocky, oxidized.
0.02'	Clay, dark gray, soft, with pyrite
0.50'	Coal, as above, oxidized
0.06'	Fusain, soft, with lenses of clay.
0.37'	Coal, with pyrite on cleat. Not so badly oxidized as upper part of seam.
0-0.06'	Pyrite, and black shale, lenticular.
0.78'	Coal, with pyrite and kaolinite.
0.03'	Shale, black, carbonaceous, grades to bone coal
0.41'	Coal, sim. to above.
0.02'	Shale, grayish black, pyritic
0.25'	Coal, sim. to above.
0.21'	Shale (Blue Band) grayish-black, hard, poorly bedded, carboanaceous, well-jointed, with streaks of vitrain near the middle. Locally divided into two layers with coal between.
1.17'	Coal, closely jointed, w. pyrite, calcite, kao


Sketch Map
cemetary
DIRT ROAD
office
Village of
Cottage Grove
RECLAIMED
AREA
NEW PIT
Anticlinal Axis or Fault
OLD PIT
HIGHWALL
ARROWS SIGNIFY
DIP OF COAL.
Rt. 13

Underclay.

Total thickness of seam 4.48'
Thickness of coal alone 4.11
Thickness of impurities alone 0.37
Percentage of impurities 8.3%

Thus this coal is 8.3% ash without even considerin the ash within the layers counted as coal. There is no cleaning plant on the site. Either the customer must clean the coal himself, or he is not much concerned with ash & sulfur in his fuel.

Joints in coal, not very regular: 035°, 125-130°, 150°. Joints in Blue Band 057°, 143°. Many of the joints are not vertical, but are steeply inclined.

Along the eastern part of this north-facing high-wall the upper part of the coal seam is full of cone-in-cone slickensides and is closely fractured. No actual faults or visible offsets are seen. In one place the lower half of the seam is almost completely crushed and has steeply-dipping fractures spaced less than an inch apart. These are quite definitly natural fractures and not the result of blasting or other mining activity.

About 100 feet from the east end of the pit the coal contains two very prominent fracture-sets trendin 050° and 150° and spaced locally less than an inch apart These fractures are not quite vertical. No slickenside or cone-in-cone here. The seam is dipping to the west or southwest, and levels off a bit to the west.

Westward the overburden is less deeply weathered and the following section is described:

5' Surficial materials, soil
10' Sandstone, orange, deeply weathered, in beds 0.1 to 0.5' thick.
6' Sandstone, gray, in beds less than 0.1' thick, with orange shaly partings.

6-8' Siltstone, medium gray, thinly laminated, burrowed, carbonaceous.
0.5' Limestone (Conant) gray, very argillaceous
1.5' Claystone, dark, soft
5' Limestone (Brereton), medium gray, massive, fine-grained, with fracture-fillings of orange clay.
0.5' Anna Shale, black, fissile.
Coal.

At one point there is a definite downward bend in the coal with intense cone-in-cone fractures affecting the full thickness of the seam. The disturbance is about 8 feet wide and the slickensided surfaces are parallel with the highwall (east-west). No actual displacements noted. Strata above the Anna Shale are not visibly affected.

I would relate the fractures and slikensides to proximity of the Cottage Grove Fault. Fracturing possibly accounts for the unusually deep weathering of rock at east end of pit.

The new pit is northeast of the old pit and does not connect. The coal in it dips off to the north. The coal is well oxidized and the overburden deeply weathered, as at east end of old pit. I surmize that the axis of an anticline separates the two pits, and the coal is eroded altogether across the axis.

Description of coal in new pit:

(Top of seam may be missing)
0.90' Coal, blocky, with abundant yellow to brown oxidation products, result of weathering before mining. This coal has been uncovered by the shovel today.
0.01' Fusain
0.12' Coal, blocky, without oxidation.
0.02' Fusain
1.31' Coal, N.B.B., blocky, closely jointed, a little kaolinite and a trace of pyrite. Less mineralization on cleat than in old pit.

0.02' Fusain or black clay interlaminated with vitrain.
0.18' Coal, sim. to above.
0.01' Clay, dark gray.
0.21' Coal, sim. to above.
0.01' Pyrite, with clay
0.25' Coal, sim. to above.
0.06' Clay (upper half of Blue Band), black, soft, carbonaceous.
0.08' Coal, soft, no minerals
0.11' Clay, (lower half of Blue Band) grayish-black, soft, carbonaceous.
0.9' Coal, closely jointed, with calcite and kaolinite.
Underclay.

The Blue Band varies along the face from medium gray to black and from clay to firm shale. It is widely present in two layers, with coal between. Hard nodules of pyrite are common. Farther east in pit the coal is oxidized top to bottom, and overburden is totally unconsolidated or deeply weathered rock.

No faults observed in new pit.

Structural Interpretation

According to a map prepared from drill-hole data and included in Nelson & Krausse manuscript on Cottage Grove Fault System (fig. 5), this mine lies directly on the master fault of the system in an area where drilling suggests at least three faults forming a lens-shaped horst. Even the closely-spaced data points are not adequate to reveal the complexity of structure. As noted above, it is very probable that either an anticlinal axis or a fault separates the new pit from the old. The northward dip of coal in the new pit is confirmed by information from drilling. The old pit may lie in a slice within the fault zone.

It is not surprising that the coal would be fractured in such an area. Indeed it is surprising that there is not more obvious indication of the fault to be seen.

The coal in the old pit lies at considerably lower elevation than the coal in the new pit.

EQUALITY MINING COMPANY SALINE COUNTY

Sept. 16, 1981

Notes by John Nelson on visit with D.K. Lumm. Rudement 7½-minute quadrangle. Reference: Note 3-1 (old pit) and 3-2 (new pit).

3-1. Old pit just south of county road, in NE¼ SE¼ SW¼ and NW¼ SW¼ SE¼ Section 10, T. 9s- R. 7E. The pit is still open but evidently all the coal has been mined and the pit soon will be backfilled. No equipment is active in this area. The highwall is roughly ¼ mile long, trends east-west, and faces south.

Measured section near west end of pit, immediately south of trailer that serves as mine office. Approx. 1400' south of center of Section 10.

6' Soil (loess ?); yellowish-gray, mainly silt with no pebbles. Not accessible.

17' Sandstone (Anvil Rock), light gray, fine-grained, micaceous, carbonaceous, beds range from a few inches to about 4 feet thick, cross-bedding distinct especially in lower part of unit; occasional shaly partings. Lower contact sharp. Upper 2 feet deeply weathered.

10' Shale (Lawson), medium-dark gray, thinly laminated silty, micaceous, carbonaceous. Becomes smooth near base, and contains small siderite nodules. Sharp contact:

0.5' Shale (Conant Limestone horizon), dark gray, firm, poorly bedded, calcareous, contains shell fragment and crinoid columnals, occasional whole shell of small productids.

1.4' Shale, dark gray, calcareous, poorly bedded, very soft, flaky, carbonaceous near top, firmer near base, lacks fossil debris; grades into:

5' Limestone (Brereton); dark gray, fine-grained, hard, massive, occasional shell fragments, and small fractures filled with white calcite.

Covered.

Eastward in the pit little stratigraphic variation is seen, except that lenses of black fissile Anna Shale locally occur between the coal and the limestone; and in the eastern part of the pit there is a large lens of Energy Shale. This gray shale is up to 4 feet thick and exposed along several hundred feet of highwall in t the eastern 1/3 of the excavation. The Energy Shale, which occurs directly above the coal, is poorly laminat ed, carbonaceous, soft and flaky where weathered, and turns yellowish-brown on exposure. Small rounded pyrite nodules and occasional ovoid concretions of very dense fine dark gray limestone occur in the upper part of the gray shale. The Anna Shale, 1 to 2 feet thick, overlies the Energy Shale with a sharp contact. Above this the Brereton Limestone is very thin to absent, reduced to a zone of calcareous shale with occasional lenticular masses of limestone. That in turn is overlain by about 2 feet of dark gray shale with abundant siderite, and silty shale above that.

There are no good exposures of the coal in this pit. Only the upper part of the seam id exposed, except at the eastern end of the pit, but there access is blocked by mud and water.

Notable is the absence of any structural deformation. The coal rises at most about 10 feet from the west end of the mine to the east. I saw no indications of faults although I was specifically looking for them. There was not even any consistent or regular pattern of joints in the overburden.

3-2) Active pit located just north of former position of county road, in S½ NE¼ SW¼ and SE¼ NW¼ SW¼ of Sect. 10. Highwall trends N 80 W and is about 3/8 of a mile long, facing south.

The workers backfill the mined-out-area with rock, probably to provide a firmer surface for the equipment. The fill covers the coal and superjacent strata in most places.

Near the east end of the pit the total thickness of overburden is roughly 30 feet. The surficial materials have thickened to 10-15 feet and, as seen in blocks fallen from the highwall, differ from those in the old pit. The materials appear to be mainly clay and silt, yellowish-gray to brownish-orange and greenish-gray, totally lacking stratification, containing much black carbonaceous debris, and what appear to be weathered fragments of shale or other sedimentary rocks. In one place a boulder of limestone is embedded in the clay at the edge of the highwall. Part of the boulder has fallen into the pit, and part is still on the highwall. The part of the boulder on the wall is about 4 feet high and 2 feet wide, with the long axis vertical. The fallen mass is even larger. The limestone is light gray, fine-grained, compact, fairly massive, and contains tiny inclusions of greenish clay. Lithologically it resembles the Bankston Fork Limestone, which overlies the Anvil Rock Sandstone in this region.

My experience with glacial deposits is limited, but I would call this till. The fragments of shale in unstratified clay, and especially the large upended boulder, point to the conclusion that this material was moved directly by ice. We are several miles south of the limit of glaciation as shown on Lineback et al's. map. This boundary may have to be re-drawn.

Farther west several more large masses of limeston are seen imbedded in the surficial sediments. Most of these rocks have their long axis horizontal. I do not believe they are weathered remanants of Bankston Fork Limestone "in situ", because the interval from coal to top of bedrock is too thin.

The sandstone is thinner in this pit than in the old pit, and it is thin-bedded and shaly for the most part. The Lawson Shale is correspondingly thicker, 15 to 18 feet.

Again the coal and strata are nearly horizontal, or gently undulating, and show no faults or other evidence of tectonic disturbance, despite our proximity to the Cottage Grove fault zone.

Equality Mining Co.
September 29, 1981
Notes by John Nelson

LOCATION: SE¼ NE¼ SW¼ Sec. 10, T9S R7E, Saline County, Illinois

Visit with Leon Follmer, John Kempton and Paul Heinrich from ISGS; and Eric Adidas from AMAX Coal Co.

To examine the surficial deposits. Highwall has advanced about 100 feet since our visit two weeks ago. 10 to 15 feet of surficial deposits on top of bedrock. Section described and interpreted by Leon Follmer. Top soil probably stripped.

TOP

3' Silt (Peoria loess), brown, weathered, fairly common cores and channels stained black (iron-manganese and organic matter) fairly porous. Looks like a "B" horizon of a weathering profile. Grades into:

5' Silt (Roxanna loess), same to above; the channels and cores very common, becomes clayey toward the base, and becomes a bit darker. May include both "A" and "B" horizons. Has vertical joints lined with light gray silt. Grades into:

3-4' Silt (Sangamon soil ? or Loveland silt), harder and blockier, root patterns very prominent on joint faces, has burrows perhaps of rodents. Orange-

gray mottled with light gray or gray-green. Toward the base becomes even blockier and the colors are very distinctly segregated. Grades into:

5' Clay (possibly till, or weathered bedrock with residual clay), light greenish-gray to olive gray, stained yellowish; tough and sticky, contains many pebbles and cobbles of deeply weathered shale and orange-brown sandstone. Slickensided surfaces common. Contains black inclusions.

In places, we have fairly definite layered bedrock (shale and sandstone) with the clay injected along bedding planes and fractures and the soil horizons developed right into the top of it.

In one place where the layering is district, the layers are tilted and deformed by sharp flexures and low-angle thrust faults, suggesting glacial tectonics—but it also could be Cottage Grove faulting. Or possibly this is colluvium; material that slowly crept down-slope.

We are not certain what we have seen, but there is no proof that we have till. Most likely weathered bedrock.

Equality Mining Co.
No. 1 Mine, Saline Co.
SE/4 SE/4 NE/4 SE/4 Sec. 10, T.9S., R.7E.
Surface mine - Herrin (No. 6) Coal
Notes by D. K. Lumm WITH S.K. DANNER
June 11, 1986

Mine is located about 1 mile east of Southeastern Illinois College. Mr. Charles Maloney, Superintendent, was our contact but we did not have much of an opportunity to talk with him. The pit which we sampled from is oriented E-W and the highwall is on the north.

The only exposed coal was a small pad near the east end of the pit. The base of the highwall was covered by gob and virtually inaccesible. We were forced to sample from the pad of coal that was being loaded out. The coal was broken and slightly shattered from blasting and from heavy equipment traffic.

Channel Sample No. 1 Lab No. 25023

Location: approximately 1450' from SL, 200' from EL, Sec. 10, T.9S., R.7E., Saline County
Description:
Roof rock removed (probably black shale).

2.20' Coal: NBB, well developed cleat; moderate amount of calcite and pyrite in cleat facings; a little kaolinite; 60-70% clarain; abundant vitrain with bands up to .02' thick; a few fusain bands up to .03' thick.

.08' Shale: (sampled) very dark gray to black; slightly fissile; contains plant impressions, coaly laminae, and finely disseminated pyrite.

1.6' Coal: NBB; similar to above; contains one small pyrite lens, about .05' thick, located 0.7' up from base of coal.

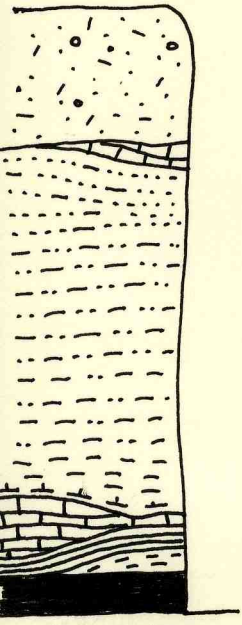
Floor Claystone: dark gray; soft; slightly silty; contains some fine carbonaceous debris.

Equality Mining Co.
John Nelson - November 1, 1988

Pit approximately ¼ mile long, trends east-west, highwall advancing north. Location: S½ SE¼ NE¼, Section 10, T.9S., R.7E., Saline County.

The Herrin Coal is being mined. It is close to 5 feet thick throughout the pit and two shale bands are conspicuous. A thin dark gray pyritic shale occurs 6" to 10" from the top of the coal; the "blue band" is 2-3" of dark gray shale with pyrite lenses, 15" to 18' above the base of the coal. There are thin shale lenses in the foot or so above the "blue band." These are discontinuous.

Several pods or lenses of dark gray Energy Shale, a few tens of feet across and at most 2 feet thick, were observed. The Anna Shale is 2 to 3 feet thick and both its upper and lower contacts are sharp.



10' Surficial materials, not studied

0-3' Limestone (?) orange-brown, massive

25' Sandstone and shale coarsens upward from dark gray well laminated clay-shale at base to silty shale and siltstone

6-12" Shale dk gray, calcareous, fossiliferous
0-5" Brereton Ls dk gray dense micritic fossiliferous nearly massive
2-3' Anna Shale black, hard, fissile
0-2' Energy Shale dk gray well lam. plant debris abundant
5.0'± Herrin Coal

The coal is horizontal in the western half of the pit, and rises gradually in the eastern half, the overburden thins eastward accordingly.

Small faults as follows:

1.) Normal fault N.10°W/60°E, throw about 4". Cuts entire coal seam and Anna Shale.

2.) Normal fault N.35°W/60°NE, throw 7", offsets coal and Anna Shale, calcite-filled fractures in Brereton Ls.

3.) Two normal faults 7 feet apart, strike NNW (?), dip 60-75° east; throw 1.3' and 2.0' down to east. They cut coal and Anna Shale as steeply inclined normal faults. They turn into a zone of vertical calcite-filled extension fractures in the Brereton Limestone, and resume as inclined normal faults in shale above limestone.

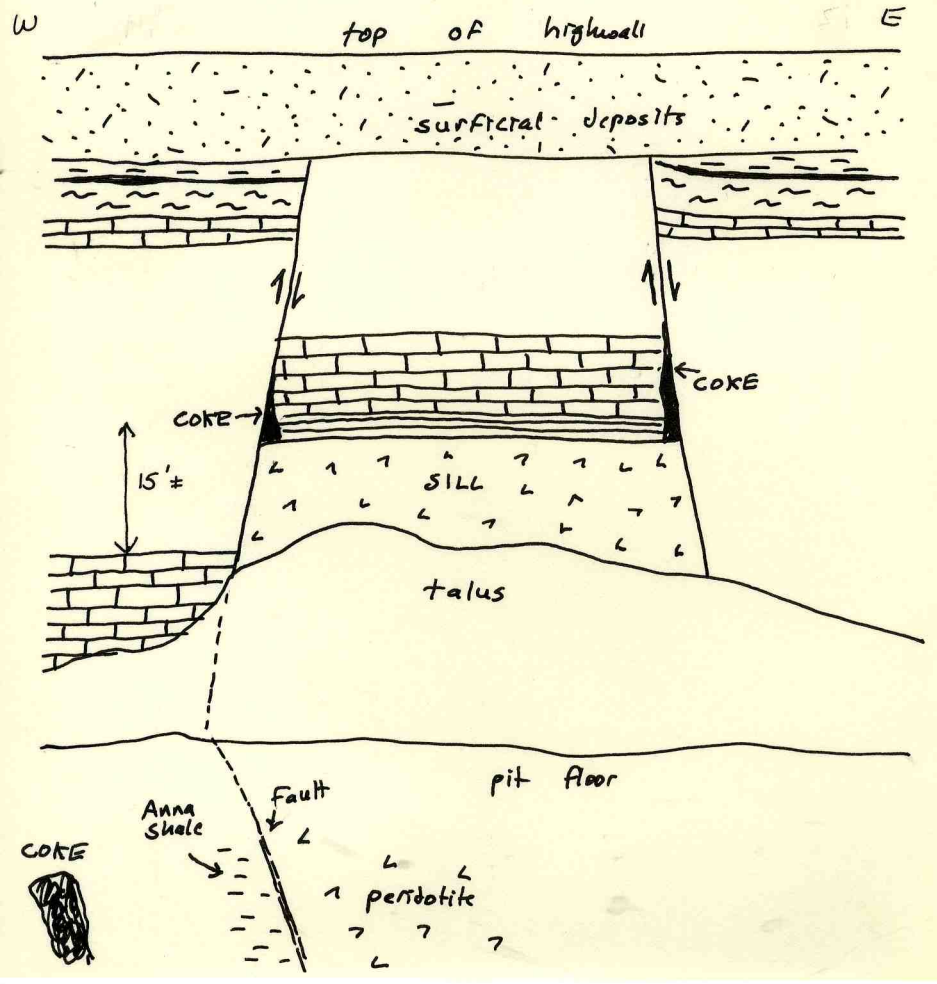
Inactive western pit

This pit is in line with the eastern pit. The coal has been loaded out and overburden is being drilled. Only time for brief survey, as the sun is setting.

In eastern part of pit the Herrin Coal has been faulted and replaced by a peridotite sill. The sill was observed only within a horst block approximately 30 feet wide and upthrown 15 feet, between two normal faults that trend N.15-20°W. and dip 80° in opposite directions. The sill rock is dark greenish-gray, fine to medium crystalline, mostly uniform texture, occasional bands with dark mica, calcite veins and blebs.

Coked and mineralized coal have been excavated, but contact of sill to coal is buried with talus. In one place the sill and western boundary fault are exposed on the pit floor. Strongly coked coal is exposed 15 feet west. (Sample EQ1-A-1)

The sill on the highwall is at least 6 feet thick, base concealed. I found no igneous dikes along the faults; however, coked and mineralized coal occurs above the sill along both fault planes. See sketch.



Equality Mining Co. November 15, 1988
John Nelson with Steve Marshak and Gang Lu (student)

Visit to observe peridotite sill I saw two weeks ago.

Since previous visit another cut has been taken on the highwall; the coal is uncovered but not loaded. The sill is covered by fallen debris, but the horst seen last time is still well exposed. Pieces of igneous rock and coked coal are scattered about the pit nearby. Highwall exposure is not in a safe condition to study.

Eastern fault strikes about N. 23° E. Along it is a "dike" of coked mineralized and slickensided coal, over a foot wide at the base, narrowing upward and extending all the way to the top of bedrock (about 30'). Bordering this on the west is a 4 to 6 inch wide dike of light gray to buff, fine-grained carbonate rock, which is very dense. The carbonate rock extends about 10' upward. No such dikes occur along the western fault.

Near the base of the incline (center of pit) the Brereton Limestone is displaced 2 - 3' down to the east along a fault. The limestone is much fractured, white calcite fills the fractures and a little tarry petroleum residue is present. Trend of fault could not be accurately determined. It appears to strike northwest and dip steeply.

Small fault still visible near east end of pit. In Brereton Limestone it splits into a series of tension gashes that strike N. 10° W. The largest one is more than an inch wide and contains two mineral fillings: white calcite in the center, yellowish quartz on both margins.

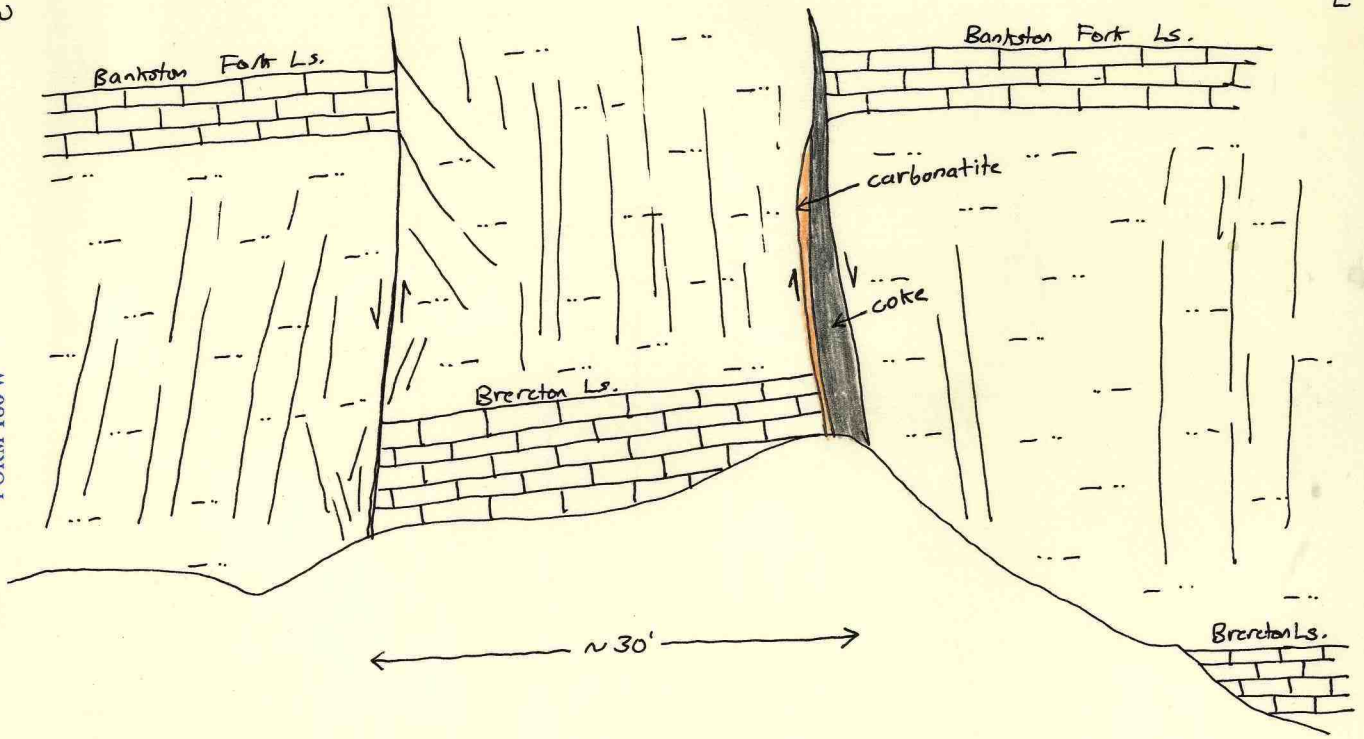
Interpretation of igneous intrusion

The intrusion exposed in the Equality Mining Co. pit was previously located by means of a magnetometer survey and closely-spaced test drilling by Peabody Coal Co. in the NE 1/4, NW 1/4, Section 10, T. 9S., R. 7E. This is about 1/4 mile north of the present exposure.

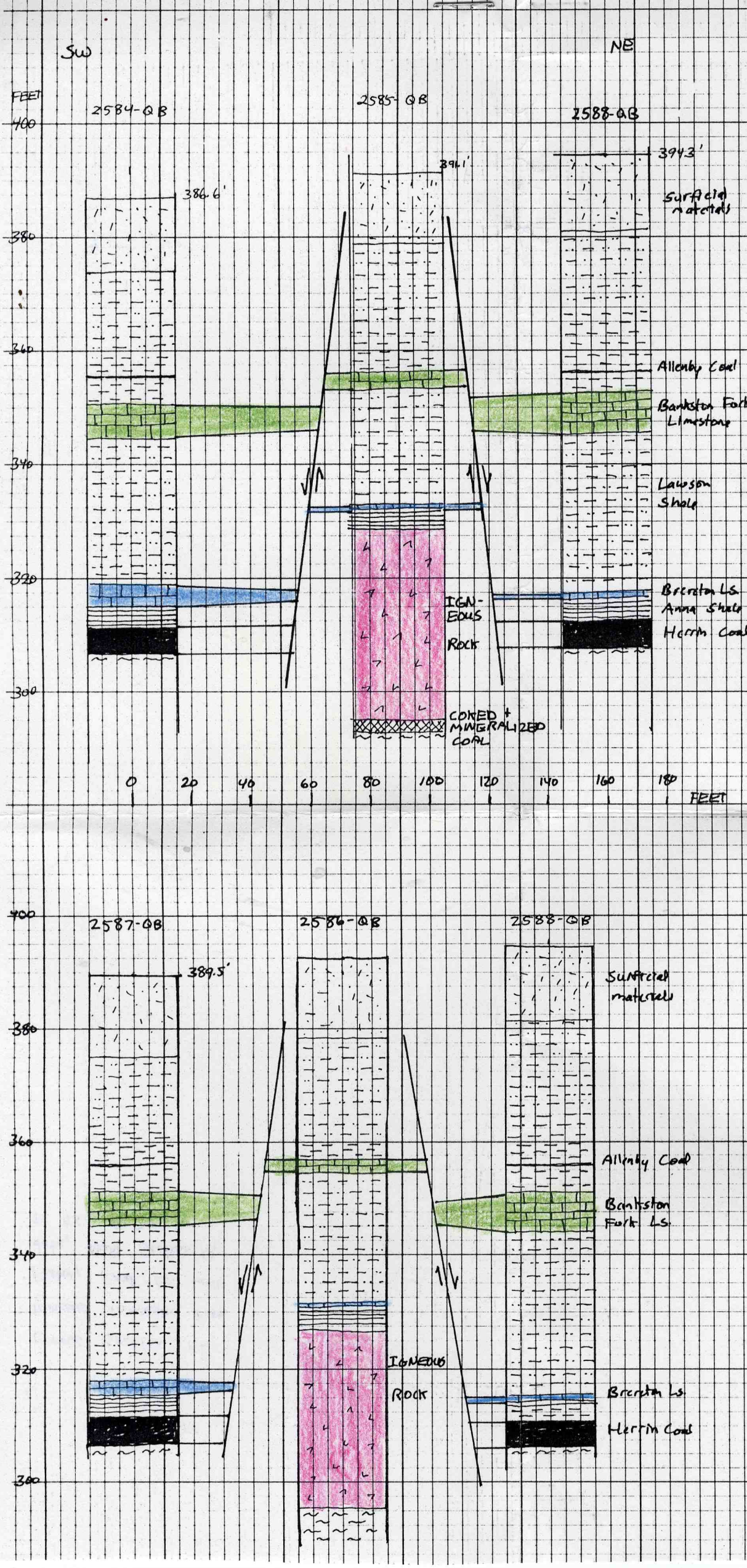
Drilling shows that the intrusion is nearly linear, a few tens of feet wide at the most, and strikes N. 20° W. It is a sill about 30' thick, replacing the Herrin Coal (see cross-section). As in the mine, the strata above the coal have been uplifted 10 to 15' above the sill. The rock immediately below the sill is logged as "underclay" and presumably is the claystone below the Herrin Coal. If so, the rocks below the sill were forced downward.

I believe that the magma reached the coal via one or both of the pre-existing fractures that currently form a horst above the sill. Upon reaching the coal, the magma coked and volatilized the coal. Some coke reached a fluid state (as it does in a man-made coke oven) and was forced upward along the fractures. Meanwhile the magma acted like fluid in a hydraulic ram, raising the strata above, and forcing downward the strata below.

Igneous rock from one of the Peabody drill cores was radiometrically dated as 261 ± 9 million years (early Permian). See Nelson and Lumm, ISGS Contract/Grant Report 1984-2, p. 32.



Sketch of highwall
Equality Mining Co.
11/15/88


SW
NE
FEET
2584-QB
2585-QB
2588-QB
400
380
360
340
320
300
386.6'
394.1'
394.3'
Surficial materials
Allenby Coal
Bankston Fork Limestone
Lawson Shale
Brereton Ls.
Anna Shale
Herrin Coal
IGNEOUS ROCK
COKED & MINERALIZED COAL
0
20
40
60
80
100
120
140
160
180
FEET
2587-QB
2586-QB
2588-QB
389.5'
Surficial materials
Allenby Coal
Bankston Fork Ls.
IGNEOUS ROCK
Brereton Ls.
Herrin Coal