

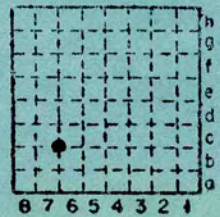
Monterey Coal Company

No. 2 Mine
MINE INDEX NO. 974

Slope

Clinton County

HERRIN



Sec. 13
 T. 1 N.
 R. 5 W.
 Index No.



Monterey Coal Company - Mine No. 2
 (Sheets) COAL PRODUCTION (Sheet)

Period		Tons	
Mo.	Day Year	Mo.	Day Year
	1977	99	504
	1978	362	305
	1979	1 297	744
	1980	2 089	261
	1981	1 827	252
	1982	2 791	743
	1983	2 397	668
	1984	3 275	349
	1985	3 027	065
	1986	3 321	591
	1987	3 153	954
	1988	2 987	289
	1989	2 762	147
	1990	2 964	338
	<i>Cumulative</i> 1991	2 490	794
	1992	3 075	865
	1993	1 065	140
	1994	3 006	741
	44,997 1995	3 002	241
	46,697 1996	1 700	977

SUMMARIES

No. to No.

Railroad, Wagon, Strip, Idle, Abandoned

slope

IDENTIFICATION

County No. _____

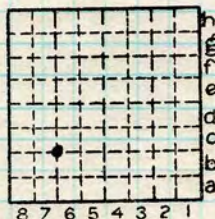
Coal No. _____

Coal Report No. S-4

6

Quad.

County Clinton



Sec.

13

N.

T. 1

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R. 5

•

W.

Index No.

COAL MINE—PRODUCTION

ILLINOIS GEOLOGICAL SURVEY, URBANA



For more info on
Monterey Mine # 2
see L Monterey C.C.
file in Coal Section office

HFD 11/23/92

Monterey Coal Mine Construction on Schedule

Construction work on Monterey Coal Company's Mine No. 2 at Albers, Ill., is proceeding close to schedule, according to Mr. B.F. Eads, Vice President and Chief Operating Officer for the company.

The first contractor on the project, Christian County Contractors, Inc., of Taylorville, has completed the work of site preparation. This work involved

construction of gravel access roads to the staging areas and surface preparation of sites where facilities will be constructed.

Zeni-McKinney-Williams of Pittsburgh, Pennsylvania, successful bidder on the slope and shaft construction, commenced work on the projects a few weeks ago. Excavation for the 17-degree slope has progressed to a depth of more than 30 feet and is proceeding with the use of coffer dams and pumps which dispose of water as the work continues deeper into the mine.

McNally-Pittsburg of Pittsburg, Kansas, is the contractor for the preparation plant and the two raw and three clean coal silos. A sub-contractor, Raymond International of Kansas City, is now engaged in putting in pile supports for the silo foundations.

Another sub-contractor, Ruttman Construction Company of Ohio, will construct the silos. These silos, when completed, will

be 70 feet in diameter and stand about 200 feet high. Of reinforced concrete, construction of a silo requires a round-the-clock operation until the unit is completed to its designated height.

Monterey's construction team,

headed by P.R. Pisanesci, consists of five total employees. Contractors on the site now have about 85 men working, including management and technical personnel of the firms as well as local citizens.

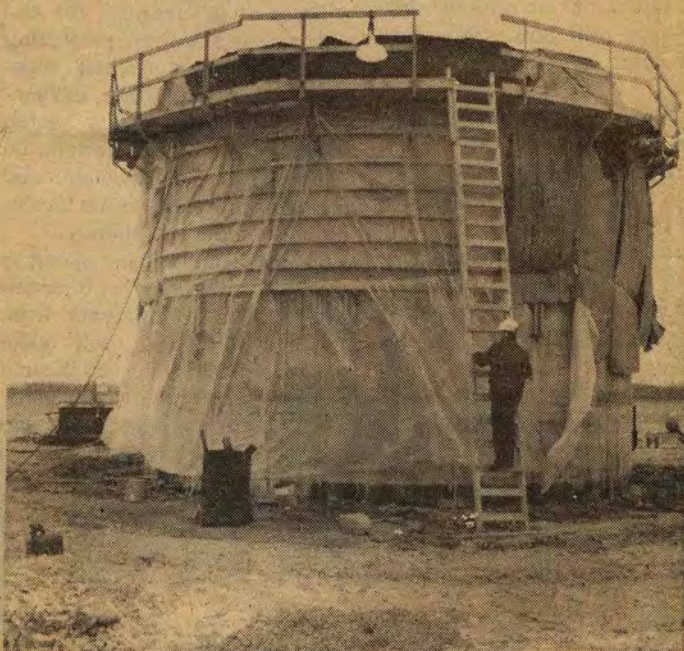
The Breeze Journal

Vol. 55, No. 8

Thursday March 20 1975



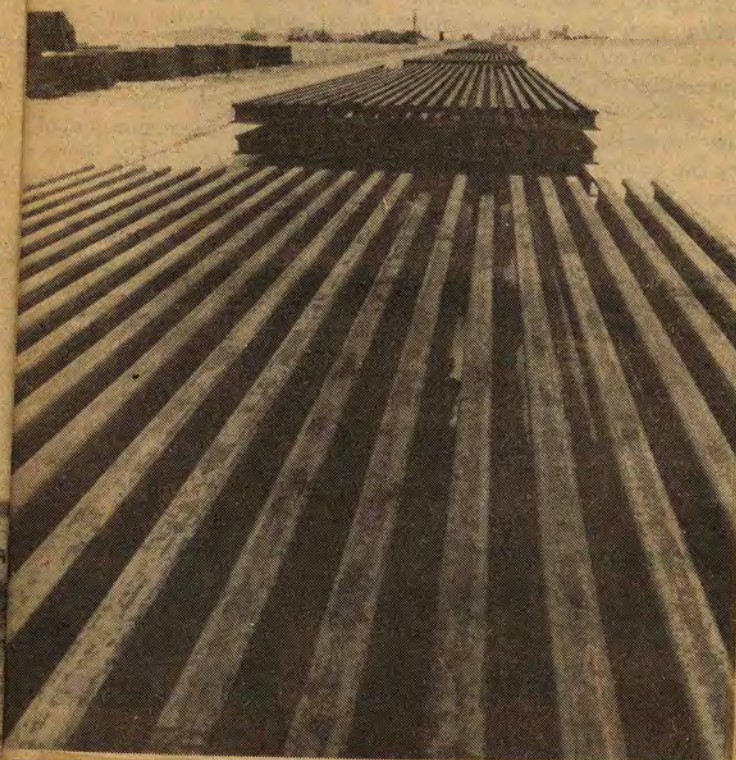
VIEW OF THE STEEL "COFFER" in which the upper portion of the slope will be constructed.



ONE OF THE TWO shafts at Monterey No. 2 Mine. Covering protect the concrete from freezing temperatures.



EMERY DIAL, Monterey employee, checking piling that will support coal storage silos.



STOCK PILES of rail to be incorporated into the proposed Railroad Spur and Loop Track. Photos Courtesy of Belle-Flair Photography

June 20, 1979

Notes by John Nelson on visit with John Popp and Heinz Damberger of the Survey, accompanied by Bob Wallace and Dennis Murphy from Carter Oil Co., and Matt Cross from Monterey.

New underground mine in Herrin (No. 6) Coal.

Carter Oil Co. is considering instituting its own geologic mapping program in the Monterey mines, which it owns. Before going underground we met with geologists and engineers from Carter and Monterey to explain our own mapping program. Then we went underground to demonstrate our mapping and to learn the general geologic conditions in the mine.

The coal averages about seven feet thick and is 330 feet deep at the shaft. At present there are seven working faces; five more are planned to come into production. All use Jeffrey ripper-type continuous miners (three have 15'6" heads and four have 12' heads). The shuttle cars are by Joy, and the roof bolters are Lee-Norse, twin-boom. Conveyor belts are used for coal haulage, and track for men and materials.

In roof bolting mechanical bolts are anchored in the first competent stratum (usually limestone) more than a foot thick. The range in bolt length is 3' to 17', depending on the position of the first limestone.

We first go to the face of the 1st East Submain. There is not much time for observation, but we see that two types of roof shale are present: (1) Black fissile well-jointed shale with concretions (Anna) and (2) Dark gray thinly-laminated shale (Energy ?). No unusual structural features were observed. In one place a variation of the Anna Shale, resembling "bastard limestone" was seen. It is a hard, poorly-bedded shale, dark gray to black, with coarse pyr-

itized fossils. It contains concretions. It was seen only in one small area.

The track entries are deeply graded so that in many places several feet of the floor strata can be seen. The roadbed is very well built with a thick layer of crushed stone beneath the rails. It is the smoothest railroad I have seen in a mine. Monterey is very concious of the need to build good haulage roads that must last the life of the mine. The overcasts and stoppings also are very solid. No wooden slam doors are used; only overcasts are used to split air currents.

Next we go to the Main North intakes at the 1st West Intersection. At the belt underpass four feet of the floor are exposed. The upper one foot is soft olive-gray claystone, which grades downward into three feet of hard, olive-gray claystone containing numerous small nodules of limestone.

Observed a large clay dike in the coal seam and roof. The dike occurs along a fault which dips about 45 degrees in the roof and steepens downward, dying out toward the floor. The coal of the footwall is folded upward (false drag). The dike consists of hard, dark gray clay about three feet wide at the top of the coal, pinching out about the middle of the seam. Numerous narrow veinlets and sills of clay penetrate the Anna Shale along the dike. There appears to be a graben at the top of the dike, with a wedge of limestone dropped down.

Pods or lenses of dark gray shale definitely occur beneath the Anna Shale. The shale tends to be rather hard and poorly bedded, locally thinly laminated, and is silty and finely micaceous, containing occasional plant fossils. Large slips which weaken the roof are common in the gray shale. In one pod the gray shale is at least three feet thick; its upper contact was not observed. Minor water seepage is occuring from the roof within the pod.

The Anna Shale is well-jointed with joints trending 070-080. The gray shale generally is not jointed.

Another area of bad top, and minor water seepage, is associated with a series of slips in the Anna Shale. A series of slips are seen, consistently striking about 020 and dipping about 45 degrees. They have little apparent displacement and are not seen to penetrate the coal. The Anna Shale is at least three feet thick.

Nearby is another area of gray shale, with many slips having no consistent orientation. Pecten is common in the gray shale.

At the head of the track the immediate roof is dark gray limestone, very shaly at the base. A linear slip penetrates the limestone and coal, and a narrow filling of clay is present along the slip in the upper part of the coal.

Next we go to the western entries of the Main South to demonstrate our mapping methods. A copy of my field map is included (over).

The dominant roof type in the area mapped is Anna Shale, with well-developed joints and many concretions. The joints strike slightly north of east (as observed earlier, and as is common throughout Illinois). The thickness of the Anna Shale is mostly unknown, except in a small area where it is very thin or absent, and limestone forms the immediate roof.

Dark gray Energy Shale occurs as small pods. Much care is required to distinguish the two shales because the Energy Shale is so dark. Carter Oil's geologists had previously not recognized the presence of gray shale. They had told us that the Anna Shale formed the immediate roof throughout the mine.

A large fault is present in the area mapped. It is a normal fault trending 050/35 NW in the third entry from the west; the throw is about 5 feet. Very definite false drag is seen on both the footwall and the hanging wall. The fault zone is narrow, with a little crushed shale and pyrite. The floor exposed at the fault consists of claystone, grading downward to nodular limestone. The roof is Anna Shale.

Southeast of the fault a large number of parallel slips or small faults are mapped. Another swarm of parallel slips occurs about 100 feet northwest of the fault. These slips seriously weaken the roof, and considerable spalling of shale occurs as we map.

The low angle of dip and the false drag indicate that the fault is not of tectonic origin. We would classify it as a "clay-dike fault". The parallel slips must be part of the same system. In my experience it is unusual for so many parallel slips to accompany a clay-dike fault, even one of this magnitude.

The mapping project is cut short because as we go northward the spalling becomes more active.

Last we visit the 2nd Panel North off the Main East. The face is about 12 crosscuts north of the Main East. We do not go all the way to the face, but go to observe a large fall (exact location not determined).

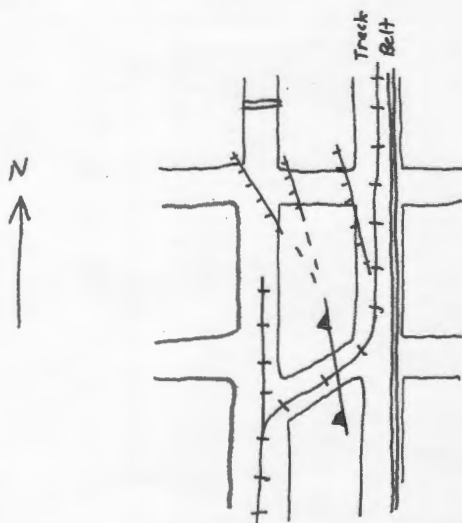
The fall is about 6 feet high and is said to be the largest that has occurred to date in the mine. It covers an entire intersection and has not been cleaned. Dust in the air obscures the strata exposed in the fall.

The fall lies at the south edge of a pod of gray shale. The contact of Anna Shale to gray shale is abrupt. The Anna Shale is about 2 feet thick, and is overlain by a layer of dark gray, fine-grained limestone containing large septarian cracks

filled with brownish calcite. The limestone is lenticular and varies from about a foot to a foot and a half thick. Above it is more dark gray or black shale. The top of the fall is a level, somewhat irregular surface, mottled greenish-gray. The view is not good enough to determine if it is limestone, but I suspect it is.

The coal contains prominent partings of clay that may be splits- see John Popp's notes.

In the panel the track and the belt are in the same 24-foot-wide entry. A row of props has been set along the belt. At the south end of the panel the track and belt diverge into separate entries. In the crosscut where the track turns is a large fault, trending 165/40 NW and having 4 to 5 feet of throw in the coal. Like the fault in the Main South, this one has prominent false drag and is considered to be a clay-dike fault. It is not present in the next crosscut to the north; only two slips or small faults with less than a foot of throw are seen. East of the large fault, a number of parallel slips are seen. This also mirrors the situation in the Main South.



John Nelson's
FIELD MAP

III

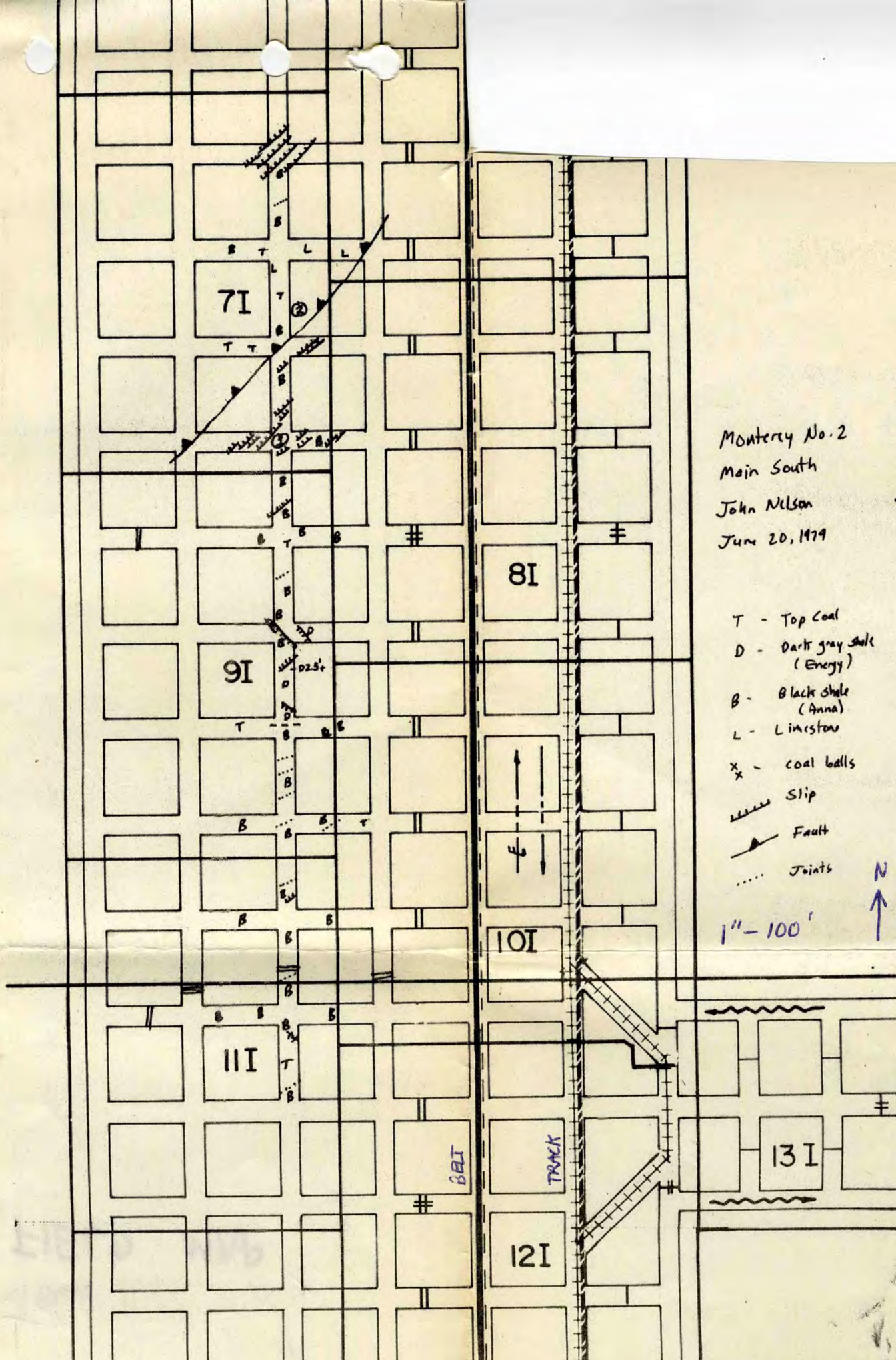
IV

V

18

19

20



Monterey No. 2
 Main South
 John Nelson
 June 20, 1979

- T - Top Coal
- D - Dark gray shale (Energy)
- B - Black shale (Anna)
- L - Limestone
- X - coal balls
- ~~~~ Slip
- ▲ Fault
- Joints

1" = 100' ↑ N

Monterey Coal Company, No. 2 Mine
Clinton County
June 19, 1979

Notes by Popp on a visit with C. J. Nelson, H. H. Damberger, and Bob Wallace and Dennis Murphy, Carter Oil Company, Sam Silverio, Engineer in Charge

The mine is about 330' deep, has a slope, air shaft, and man shaft. There are presently seven units in operation with seven more to come on. Mains are two sets of seven entries. Entries are twenty feet wide, except track-belt entries which are 24'. Coal thickness ranges between 7-9 feet.

There are no major falls; they don't leave roof unsupported for any period of time. Falls occur where there isn't any limestone. Every 18' (one cut) an additional foot is drilled to make sure the "anchor zone" is substantial. Bolts vary in length from 30" to 17'.

The mine is having good roof. Roof falls have been minor. The only problem comes in finding the anchor limestone.

Current coal production is about 5000 TPD clean (about 1 million tons per year). Full capacity is 3.5 million tons per year with 36 percent reject.

Faults have been found, none of which displaced the entire seam. Slips are present in transition zones from thick Brereton to thin or absent. Rolls are reported where both top comes down and bottom comes up.

Immediate roof is black shale with limestone in the area of the present mine works.

Nearest abandoned mine is the Southern Coal, Coke and Mining Company about 4 miles to the west. They abandoned about 1935.

Before going underground John, Heinz, and I met with Sam Silverio, four other engineers, and Dennis Murphy and Bob Wallace of Carter Oil Company.

(figure)

Pg. 2 of 5

Monterey No. 2
6-19-79



There is a major "splay" of gray shale to the north-west; however, along the channel they do not have gray shale in the area of the split coal. Generally, split coal has black shale and limestone above the split coal, as seen in cores.

They have made a couple of maps which show the length of bolts necessary to encounter a thick limestone. The resulting maps are almost an isopach of the Brereton Limestone.

Sam Silverio felt that the use of the bolt length maps and our mapping program would be to predict problems, in advance of mining, that would affect production. Therefore, management could be notified in advance that production will be down due to problems. The real problem is not that there is a roof problem but rather that the miner must wait for the bolter when the bolter is drilling up to 17' bolts. The company tries to bolt as quickly as possible, and if the bolter has to drill 12'-15'-17', he spends a lot of time before getting the new roof bolted.

Monterey No. 2 Mine

June 29, 1979

Underground visit with Damberger, Nelson, and Wallace, Murphy of Carter Oil Company, and Matt Cross of Monterey Coal. Notes by Popp.

Purpose of visit is to see roof conditions. The visit took place after the general meeting with Monterey officials.

At the shaft bottom there is a small pod of gray shale, "slips" and clay dike faults. The pods appear to be pretty small in diameter, maybe a few tens of feet across.

We first went to the First East Submains off the North Mains.

While black shale appears to be the immediate roof, there is dark gray, fossiliferous, bastard limestone present just above the coal in one area. Anna concretions poke their way through, and are reported to be present throughout the mine. In an overcast there was about 4' of Anna exposed with hard, massive Brereton limestone above.

Rode up to Unit 4 in the North Mains. Matt reports all good top in this area with 30" pins, probably because of the limestone being practically on top of the coal. Some small slips or faults are present in the limestone.

There are some real nice clay dikes and clay dike faults which die out downward. The dikes are trending about 70° and have both convergent and divergent bedding. The roof is not disturbed too much - mostly just small slabs and sloughing.

A large pod of gray silty shale is present along with slips. The result is that the roof is falling some and Matt reports the area was especially wet. The gray shale is up to 3'-4' thick.

We traced the area over to another wet area. Gray shale and slips were present, and the roof was coming down some. The area will be hard to hold. In this area the slips are trending about 020° .

The area is sizzling with gas emission, but that is normal for such new mining.

After touring the North Mains area we went to the South Mains where we mapped on 1"=100' maps. See maps in file.

1. Exposed in this entry and several crosscuts is dark gray shale with up to 3' of exposure in two slips. The shale has a greasy black lustre, but is somewhat silty and has apparent bedding. Its contact with the black shale must be transitional for it is very hard to see. Roof conditions are noticeably different than in black shale top. The shale has irregular slips while black shale is smooth, regular, and jointed.

Pillars are hissing gas, which is interesting since they are exposed on all four sides.

2. Fault

A non-tectonic fault with displacement of about 4' is trending 040° . To the northeast it changes trend slightly and then jogs en echelon apparently as shown. We left for lunch before I had a chance to look it over good. The dip of the fault apparently becomes less going northeast.

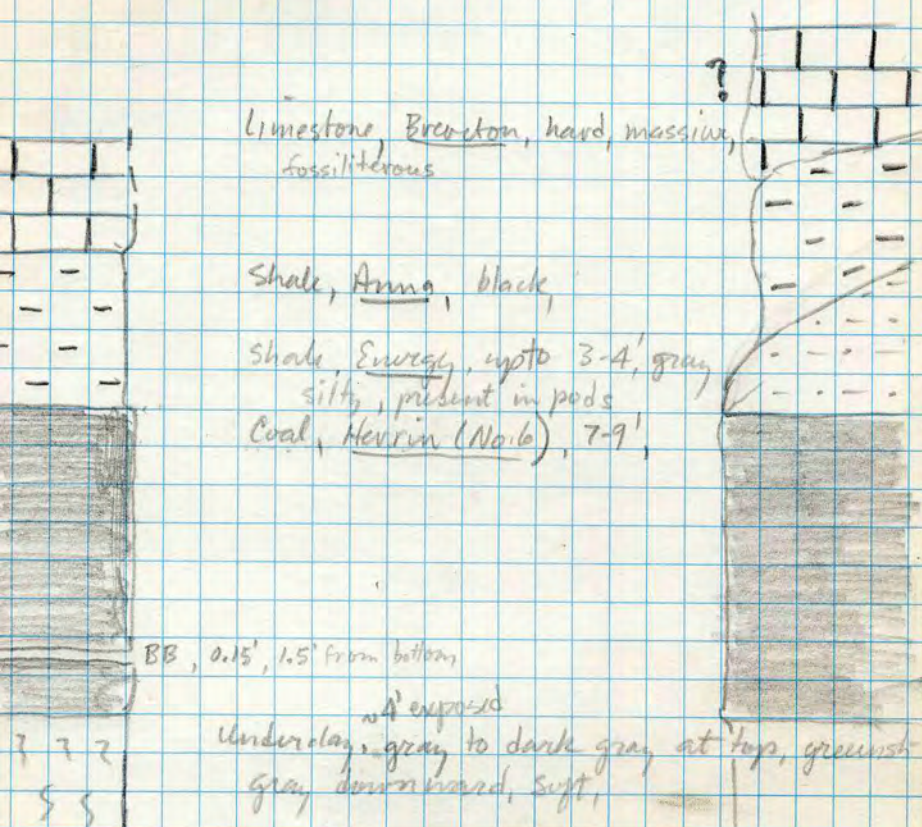
In the afternoon we went to the Second Panel off the Submains East. Purpose is to look at a fall.

There is a fairly large fall about 7' high which C. J. Nelson described. In the area of the fall is dark gray shale top, although the gray shale is not thick. The top looks pretty unstable and in places are coffin-cover slips.

Of real interest are a couple thick partings in the seam. Actually the seam has a benched appearance in which the coal breaks apart along a bedding plane and along which may be clay/shale filling. Coal thickness is about 7.7', and the partings are up to 0.15' thick. Blue band is about 1.3-1.4' from the base. Ribs are beginning to spall, probably reflecting the increased entry width.

Saw another clay-dike-type fault trending about 160° - 165° which offsets the entire seam about 3'-4'. Location is at the south end of the Panel at the junction of the belt and track. The immediate roof is dark gray shale, and the fault marks the transition from gray shale to black shale.

Monterey No. 2 Mine
Clinton Co
6-20-79



Limestone Breckton, hard, massive, fossiliferous

Shale, Anna, black,

Shale, Enoreg, upto 3-4', gray silty, present in pods

Coal, Herrin (No. 1), 7-9'

BB, 0.15', 1.5' from bottom

Underlay, ^{not exposed} gray to dark gray at top, greenish gray downward, soft.

7 7 7
5 5

[2'

Monterey No. 2 mine

June 20, 1979

Roof lithologies



Limestone



Black shale



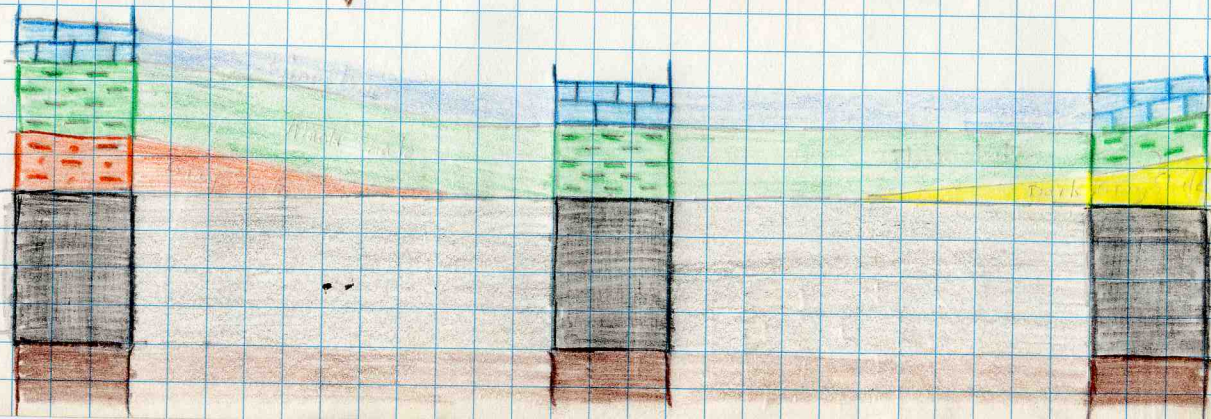
Dark gray shale



Gray Shale



Underclay



Notes by John Nelson on visit with Steve Danner.
Accompanied by Dennis Murphy, geologist, and Andy
Mandich from Monterey.

Purpose of visit was to make general geologic observations and to collect three channel samples. For detailed descriptions of coal at three sampling localities, see Danner's notes.

Dennis and Andy talked about a "fault zone" in Unit 7, which comprises the right-hand entries of the Main North. The Main North Entries actually trend northwest from the shaft bottom. Someone in higher management at Monterey told Dennis that we could not go into Unit 7 even though a full crew was working there. Apparently they thought it was too dangerous for visitors, or maybe they were afraid of adverse publicity. Monterey (a subsidiary of Exxon Oil Co.) really is top-heavy with bureaucracy. They also would not allow us to take a run-of-mine sample even though we had no trouble getting permission to take channel samples.

Dennis and Andy said the faults in Unit 7 were encountered after crossing an area of steep dips (up to 20% grade) in the coal. The faults apparently are normal faults; the amount of offset was not specified and the faults trend N-S or NE-SW. The faults and steep dips are associated with an area of Energy Shale roof which Dennis has mapped. The faults apparently do not extend into the left-hand entries of the Main North, which we were allowed to visit. From all that I was able to gather I conclude that the faults in Unit 7 probably are the result of differential compaction and are not tectonic structures. I have heard rumors from at least two sources that reverse faults have been encountered in Monterey No. 2. However, Dennis denied that any reverse faults have been struck in the mine.

In Unit 4 (left-hand entries of the Main North) both gray shale and black shale roof are present. The gray shale is medium-dark gray, micaceous, silty and finely laminated. In places it is almost a siltstone and it is definitely coarser than most of the gray shale we see in small lenses like this. The Anna Shale is black, hard, and fissile, and locally contains concretions up to four feet across.

The gray (Energy) shale is a fairly competent rock but the abundant large compactional slips found in the lenses make for difficult roof stability. Many of the faults are continuous for 100 feet or more and show several feet of offset in the coal. They tend to occur in parallel sets and strike more or less parallel with the edges of lenses of gray shale. Many times they form "coffin covers" and shale drops out immediately after mining. Most likely these are the kind of faults encountered in Unit 7.

The coal seam undulates somewhat. In some places the coal drops in elevation going from black shale roof to gray shale; but elsewhere the reverse is true.

In the intake-air entry (southwesternmost entry) we can see the edge of one of the gray shale lenses. The shale thickens from 0 to 3 feet within 10 feet laterally. The black shale overlies the gray shale with a sharp contact; a pronounced angular unconformity.

In the intake-air entry 10 crosscuts outby the face is a large fault and clastic dike. The fault has 2 to 3 feet of throw (normal) and cuts through to the underclay. The clastic dike is filled with medium-dark gray silty shale containing irregular lenses of siltstone and thin stringers of coal. The lamination within the dike is tilted or disturbed but is still quite definite. The filling of the dike is lithologically the same as the roof shale at this locality.

We traced the dike northeastward along strike through three adjacent entries; it continues still farther but we did not follow it. In the three entries

the dike has the same type of filling material even though the roof has changed from Energy Shale to Anna Shale. The fault is much smaller and the dike less prominent than in the intake entry. Most of the details are hidden by a thick coating of rock dust.

I have the impression that this dike might have formed as the Energy Shale was being deposited. The coal was ruptured and silty shale deposited within the fissure. Later the Energy Shale was largely eroded from above the coal, and then the Anna Shale was laid down. The clastic dike, within the coal, was protected from erosion. Still later differential compaction occurred as a result of the presence of relatively uncompressible clastic material within highly compactable peat. This differential compaction is responsible for the fault and for the various minor slips which extend upward into the Anna Shale.

Split coal is being mined in the northeastern part of the mine, which is less than a mile from the Walshville channel. (See Danner's description of the seam at Channel Sample 2). In the 3rd Panel North off the Main East, three clastic partings were noted. The highest is about 1.3 feet below the top of the coal and consists of a very thin layer of dark gray carbonaceous shale with pyrite. In places the shale is absent but the coal still has a very definite parting on this surface. According to Dennis, drilling has shown that this upper split widens to the north.

The middle split, about three feet below the top of the seam, is nearly a foot thick and is found throughout the northern part of the panel. The split consists of medium to dark gray claystone. It is mined with the coal and later removed in the preparation plant. This split also thickens to the north and northeast and is well known from drill cores.

The lowest split, at the level of the Blue Band, includes the Blue Band and up to half a foot of thinly laminated dark gray shale and coal. It also is mined

with the rest of the seam and removed in the cleaning plant.

The roof in most of this area is Anna Shale. This contrasts with most other known areas of split coal in Illinois. Generally split coal is overlain by thick gray shale. In this case it is apparent that the Walshville channel delivered three separate loads of clastic material into the coal swamp, but stayed within its banks after the end of coal-forming time, so that marine rocks were deposited directly upon the coal.

In the Main South the roof is limestone and Anna Shale. Several large compactional faults were observed. We has very little time for observation.

Monterey Coal Co. Mine No. 2 Clinton County
May 15, 1980

Notes by Steve Danner on a visit with John Nelson accompanied by Dennis Murphy, geologist, and Andy Mandich, engineer, both Monterey employees. The purpose of the visit was to collect channel samples and make geologic observations.

Channel Sample Location #1: 30' in from crosscut 62 in entry 5 of Main North intakes, or 250' south and 550' west of NE corner of SW $\frac{1}{2}$ NE $\frac{1}{2}$ Sec. 14, T.1N, R.5W. (sample # C21045)

Roof Shale: med dark gray, hard, pyritic, slightly carbonaceous; pyrite is finely disseminated, and in nodules up to 0.7' in diameter; also a moderately continuous lamina of pyrite between the base of this unit and the coal; laminar bedding in spots; limestone may be close here because a 2 foot square exposure can be seen approx 15' from sample site.

- 0.20' Coal: N.B.B., irregularly interbedded with the roof shale, very pyritic. (shale and pyrite excluded from sample)
- 0.86' Coal: N.B.B., hard, cleat indistinct, vitrain-rich, trace of calcite and pyrite.
- 0.03' Fusain: hard with much fine grained pyrite; lenticular.
- 0.48' Coal: N.B.B., similar to above.
- 0.01' Pyrite: hard, lenticular.
- 1.80 Coal: similar to above; increase in dull attrital coal; moderately dull luster; occasional thin stringers of pyrite; some calcite on cleats.
- 0.09' Shale: black, hard, carbonaceous, locally grades to dull coal; contains thin vitrain streaks; pyrite lenses common near top;

(cont.)

band is continuous but variable in thickness. (excluded from sample)

- 0.66' Coal: similar to above.
- 0.02' Pyrite and Coal: thinly interlaminated.
- 0.49' Coal: similar to above with a little pyrite on cleats.
- 0.05' Fusain: moderately hard, no visible pyrite; lenticular.
- 0.25' Coal: N.B.B., vitrain-rich; abundant calcite on cleats.
- 0.31' Shale: med dark gray at top, becomes darker gray downward; hard and smooth; increasingly carbonaceous downward; vitrain streaks near base; pyritic lenses common near top. (excluded from sample)
- 0.63' Coal: N.B.B., 50% vitrain; little calcite or pyrite.
- 0.12' Fusain: hard, no visible pyrite, very local lense.
- 0.65' Coal: similar to above.
- Floor Claystone: med dark gray, mottled, smooth, abundant carbonaceous debris.
- Total Thickness: 8.54'

Channel Sample Location #2: Room 46 off west return of 3rd North panel off Main East, or 40' south and 380' east of NW corner of SE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 13, T.1N, R.5W. (sample # C21046).

- Roof Shale:(Anna) black, hard, smooth, fissile, well jointed in places; contains pyritic limestone concretions; fairly continuous pyrite band at base; sharp contact at base.
- 1.35' Coal: N.B.B., approx 30% vitrain; attrital coal is moderately bright; numerous fusain laminations and some lenses;

(cont.)

numerous calcite-filled fractures; some calcite on the poorly developed cleats; very little pyrite.

0.03' Pyrite and Coal: two bands of pyrite separated by 0.02' of coal; continuous band.

0.86' Coal: N.B.B., similar to above; vitrain bands less than 0.02' thick in this unit.

0.01' Pyrite: hard, discontinuous.

0.75' Coal: N.B.B., similar to above; cleat better developed than above; several pyrite streaks; still much calcite in fractures.

0.62' Claystone: med gray, mod soft, crumbly, greasy luster but not definitely slickensided; no visible pyrite except for thin band near base; no visible calcite. (major split; excluded from sample)

0.68' Coal: N.B.B., vitrain bands thin as above; contains partings of fusain up to 0.01' thick; much calcite in fractures and on cleats.

0.01' Pyrite: hard and discontinuous.

0.89' Coal: N.B.B., attrital coal is midlusterous; vitrain less than 0.03' thick; cleats better developed than above.

0.02' Pyrite: hard and discontinuous.

0.68' Coal: N.B.B., similar to above, less calcite.

0.02' Pyrite: discontinuous.

0.31' Coal: N.B.B., similar to above.

0.02' Pyrite: fairly continuous.

0.01' Vitrain: continuous.

0.01' Pyrite: continuous.

1.01' Coal: N.B.B., very little calcite and pyrite; cleat poorly developed; vitrain less than 0.02' thick; generally thin banding.

0.58' Shale: dark gray to black, smooth, mod soft, fissile; contains numerous vitrain bands, vitrain bands become thinner in lower $\frac{1}{2}$,

(cont.)

laminated near base, (excluded from sample)

0.39' Coal: N.B.B., has numerous thin pyrite partings; less than 20% vitrain in extremely thin bands.

0.01' Pyrite: discontinuous.

1.03' Coal: N.B.B., thinly banded, less than 20% vitrain; cleat poorly developed; some calcite on vertical fractures.

Floor Claystone: med gray, smooth, soft, slightly mottled.

Total thickness: 9.28'

Channel Sample Location #3: Unit 5 Main South returns, entry 7, crosscut 68, inby spad 2282, or 290' north and 420' west of SE corner of SW $\frac{1}{4}$ Sec. 24, T.1N, R.5W. (sample #C21047)

Roof Shale: med to dark gray; finely laminated to massive, hard, smooth, contains thin vitrain stringers; some slickensides; some pyritic concretions, also pyrite laminations between shale and coal; numerous poorly developed marcasite dollars.

1.20' Coal: N.B.B., 30% vitrain, attrital coal mid-lusterous; hard, cleat poorly developed; calcite and a little pyrite in vertical fractures.

0.01' Pyrite: fairly continuous, but thickness varies.

0.59' Coal: similar to above, contains a few thick dull bands near base.

0.01' Pyrite: discontinuous.

1.69' Coal: similar to above; one small pyritic shale lense near middle; several pyrite goat-beards.

0.02' Pyrite: hard, fairly continuous; thin dark shaley streaks.

- 0.77' Coal: N.B.B., similar to above.
0.01' Pyrite: discontinuous.
0.11' Coal: similar to above with small pyrite lenses.
0.01' Pyrite: discontinuous.
1.68' Coal: N.B.B., middle of unit is mostly dull coal, less than 20% vitrain, with numerous fusain lenses; upper and lower portions of unit similar to upper part of seam; trace of calcite on cleats; one small pyrite lense near base.
0.08' Shale: grayish-black, hard, highly pyritic, contains large pyrite lenses. (excluded from sample)
1.50' Coal: N.B.B., 30-40% vitrain; more thinly banded than rest of seam; no visible minerals on cleats; several thin pyrite laminations near base.
Floor Claystone: med dark gray, soft, smooth, carbonaceous, coaly streaks.
Total thickness: 7.68'

Chemical analysis request # R-16518
Composite face channel # C21048

Note: It should be noted that even though Monterey was good enough to let us take channel samples, their corporate paranoia would not allow us to take a run-of-mine sample. This was the case at both Monterey #1 and #2. No reason was given for the denial.

Random notes:

Entry #3, crosscut # 62: Gray shale (Energy), mod silty, breaks in large (10' dia.) concentric fractures with sharp edges; numerous coffin cover slips;

hard and thinly laminated to massive.

Entry #3, x-cut #60: Black shale rides up over gray shale; approx. 3 inch zone of intermixing; rolling contact; some carbonaceous streaks in gray shale.

Entry #2, x-cut #62: Gray shale inclined gradually to NW; numerous long sinuous slips up to 150' long.

Note: Coal from channel sample location #2 is said to be harder and yield more fines than coal elsewhere in the mine.



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ISGS Mine Notes - Monterey No. 2 - Clinton County

Visit: December 18, 1989 by Phil DeMaris, Mark Phillips and Kumar Chandrashekar of SIU-C, escorted by Jeff Padgett, Roof Control Specialist

Coverage: Introduction
 1st W. off Main N.
 1st E. off Main S.
 15th S. panel off 1st E.
 Discussion
 Samples: Set M02-A-1 to 8

Introduction

This is the third mine visited for this years part of the IMSRP-funded ground stability project. The mine is 1/2 mile south of Albers on the access road to I-64. Second day of visit had to be delayed until April 10. Herrin Coal is consistently six feet or more; Jeff indicates the seam has three partings on E. side of the mine, and the lowest parting thickens to the E. toward the Walshville channel, becoming a split.

1st W. off Main N. (Area 901)

As we traveled to NW along Main North Jeff briefed us on conditions. The Anna Shale is the predominant roof lithology and is generally averages 2' to 4' thick. The Anna becomes better jointed to the west as it thins. Where it is thin and better jointed it causes more accidents and "ragged top" because it is also more moisture sensitive. Where the Anna is thicker, it is more massive and also has more concretions, but once bolted there are fewer overall problems.

A. We paused to examine a through-going clay dike in Herrin near junction with 1st west. Jeff indicated that there were anchoring problems in this area where the Brereton disappears and wet Lawson shale is over it; this condition occurs where Energy Shale lenses are the roof. We met Phil Elliot, face boss, who discussed roof conditions with Jeff in terms of "black shale" and "limestone". A thin, black, impure limestone onlaps and flanks Energy Shale lenses, which historically would be called "bastard limestone" at ISGS because it is older than the Anna Shale. The "bastard ls." is typically 0.2' or more thick and flanks Energy lenses in various directions. In the north part of the mine the "bs. ls." occurs in small patches where there are no Energy lenses. The bs. ls. is granular in appearance, contains many small calcareous shells/fragments? and has some coal stringers near the Herrin contact.

B. We examined edge of Energy Shale lens on intake air. N-S cutters are present. I sampled base of Energy (-A-1) which is medium gray, has occas. vitrain stringers on bedding, and occasional pecten fossils. Amount of carbonaceous matter varies somewhat stratigraphically. Jeff indicates that he and Dennis Murphy mapped out the Energy lenses in a section of the mine with help from engineers--this was done over 5-year period in early 1980's. He notes occasional lenses in this submain, but mapping is no longer routine.

Energy lenses are seen up to 5-6' thick in cores, to 6½' thick in falls, and he indicates the Energy becomes sandy near the Walshville. They try to bolt 4' of limestone and they often lose this condition well before actually hitting a lens; however 4' of Brereton can be present over 2' of Energy Shale; the thinning relationship is real

but quite variable. The Jamestown/Conant interval is always present but often thins over Energy lenses.

C. Fall at stubbed entry; posts used in area. Bs. Ls collected (-A-2) flanking Energy Shale at edge of lens. 7.9' coal under Energy roof here. Jeff indicates thickness of Herrin varies over broad areas; not by roof lithology, in his experience. He says the greenish-mottled Lawson is weaker than "normal" Lawson, and they map percent of altered Lawson from drill hole data. Fall extends partly into mottled Lawson here.

Second stubbed site with fall shows max. 5½' Energy Shale with Bs. Ls. over it, no Brereton seen. Energy is full of medium angle faults in the bottom 2'; faults strike in all directions.

D. A high, off-centered fall at intersection; fell first over shop bench, ultimately to the Bankston Fork. Sequence is:

- (top) Base of Bankston Fork spans ca. 15'
- est. 3-4' Lawson Shale, mottled at top
- est. 1½' Conant ls., nodular but continuous
- est. 2' Jamestown position, coaly shale(?)
- 2' or less Brereton Ls., rooted from above, and one slip noted
- 2-2½' Anna Shale with roughly spheroidal concretions under 1' in diam.
- thin Bs. Ls. present

Fall is roughly 12-13' high. It's occurrence prompted reappraisal of bolting plan. If Brereton is thin they bolt to Bankston Fork when possible

in this area. I sampled a top-coal coal ball under Bs. Ls. (-A-3).

E. Close to the working face (west) we saw second big fall (about 11' high), now cribbed on all 4 sides. Energy Shale has multiple medium-angle slips which extend well into Herrin Coal and intersect high in the shale sequence. Sequence is:

- (top) Bankston Fork Ls., prob. over 2' thick with med.-angle slip at base
- 3-4' Lawson Shale, less mottled than at D.
- 1' Conant Limestone, lumpy, nodular -bedded, but continuous
- ½' Jamestown interval, only glints of vitrain (no Brereton)
- <½' Anna Shale; gradational contact to:
- ca.6' Energy Shale, full of slips

I sampled the basal 0.2' of Energy Shale (A-4).

F. Close to working face a 500' wide Energy Shale lens has been encountered. The edge shows Anna Shale with many concretions, all 1' or less in diameter, onlapping the lens. Over Herrin, the concretions each press a little into the top coal.

1st E. off Main south (Area 902)

G. We paused along the 1st E. Submain off the Main S. under fall (not examined) where Jeff briefed us on bolt corrosion. They have problems with corrosion of bolts in both the "green" Lawson Shale and the "clod" of the Brereton. Bolts fail

in as little as 3 yrs. due to pitting and drop out; on mains they must rebolt. It is worst in long bolts in old areas at the Lawson/Bankston Fork contact, but also occurs in "clod" zones over long periods. Thus, a lot of money is lost to this problem. The apparent mode of contact is swelling of these materials to contact the bolt shaft. It is not directly a water problem because it occurs in dry areas. Plastic sleeves are being tested now--it is probably an electrochemical problem.

15th S. panel off 1st E. (Area 903)

H. 15th S. panel off 1st E. submain is at extreme SE end of mine. I had expected to see thickening of the blue band but Jeff says it only occurs on the North side of the mine. However, the far E. end of the submain drops topographically and the floor becomes a sandstone. We parked at 14 c/c and walked south. In the south part of the mine the top parting is seen to thicken. Here it is 1.55' from top of seam under Anna roof; this may be above regionally-present partings; Jeff considers it a split. It is 0.32' thick with the bottom 0.08' of that very carbonaceous (actually multiple vitrain sheets). It is a "sticky" claystone which squeezes out under load at pillar corners (parting/split sampled as -A-6). Jeff believes a contributing influence to instability in this part of mine is a preglacial valley with drift to bedrock ratios of 1.7 to 2.0.

At 20 c/c we saw cutter roof in Anna with fossil shells. A "pyrite dollar" for XRD analysis was collected in this area (-A-5). Jeff indicated average underclay thickness was 2' to 5' but it sometimes reaches 7'.

I. Face of entry 3 at c/c 22 is very wet area. There is 0.15' "clod" over Herrin, and bioturbation "tubes" on base of Brereton ls. Water is streaming from a slip or bolt hole at the face.

Face of entry 4 (numbered E. to W.) shows separation planes in Brereton--they appear to be irregular bedding or low-angled slips. These surfaces have fine crystal on them, so there was premining movement or fracturing. There is no sign of any faulting here so this is puzzling. Examination of the Brereton sample (-A-7) in daylight shows the surface with fine crystals appears to be a plane of movement. I also collected the Blue band here (-A-8) where it was at least 1½' above the underclay and 0.21' thick, both bulk and block of lower third.

J. A 6' fall at c/c 19 on Entry 1 in thick Anna was examined. Fall is elongated N-S. They bolted a little top coal on the far side of the fall, so the 5' bolts caught only the base of the limestone. The base of the Brereton has irregular bedding surfaces similar to what we saw at site I. Sequence is:

- 2'+ Brereton ls. with irregular bedding surface
- 4' Anna Shale
- Herrin Coal (2.18' coal below blue band)

Discussion

Energy Shale lenses produce most of the larger roof instability problems we examined and all falls of 4' or higher associated with Energy



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lenses were also associated with thinning, weakening and/or loss of Brereton limestone over the lenses.

More dangerous is the thinning of the Brereton without Energy Shale (as in area 901) since there is no immediate roof lithology change to signal a problem. Apparently this is an unusual occurrence, but d.h. data should be checked for this.

Roof failure in the bottom 1' of Brereton, as seen at J. (area 903), is an unusual occurrence. I've seen this previously only where clay bands are within the unit. The irregular bedding may be more common than we think, since the bottom 1' of the Brereton is usually bolted to the middle or upper part of the same unit.

Samples: Set M02-A-1 to 8

- 1 B. Base of Energy Shale lens (oriented piece and carbon sample)
- 2 C. "Bastard Limestone" immediately on Herrin (full chem.)
- 3 D. Coal ball in top coal under Bs. Ls. "roof"
- 4 E. Basal 0.2' of Energy Shale (full chem.)
- 5 H. "Pyrite dollar" for XRD confirmation
- 6 H. Herrin parting/split high in seam where 0.32' thick (XRD)
- 7 I. Brereton Limestone with fine crystals on fracture surfaces
- 8 I. Blue band of Herrin Coal where 0.2' thick and at least 1½' above c/c. Block of lower contact (gradational) n mand bulk for carbon and XRD.

ISGS Mine Notes - Monterey No. 2 - Clinton County

Visit: April 10, 1990 by Phil DeMaris
Mark Phillips and Kumar Chandrashekar
of SIU-C, escorted by
Jeff Padgett, Roof Control Specialist

Coverage: Introduction
3rd N. panel off 3rd W.
1st W. submain off N. Main
1st/2nd S. panel off Main E.
1st W. off S. Main
Discussion
Samples: Set B-1 to -4

Introduction

This is the second day of our visit to Monterey No. 2, the third mine examined this year. Jeff indicated that there would soon be an announcement of planned development in the E. Hornsby due to interest of CIPS in the low-sulfur coal. We will go first to Unit 7 which is a "super unit" where they drive 10 entries (5 and 5 side-by-side). Super units have 2 continuous miners, 2 bolters, 2-3 shuttle cars and 2 scoops. These units were created to reduce development costs in favor of productivity. They will run 3 shifts per day, and they fit in maintenance within a move, setup and cut cycle. All miners have a FM radio for communications. They are getting 1700 tons per man shift; crosscuts in panels are on 75' centers.

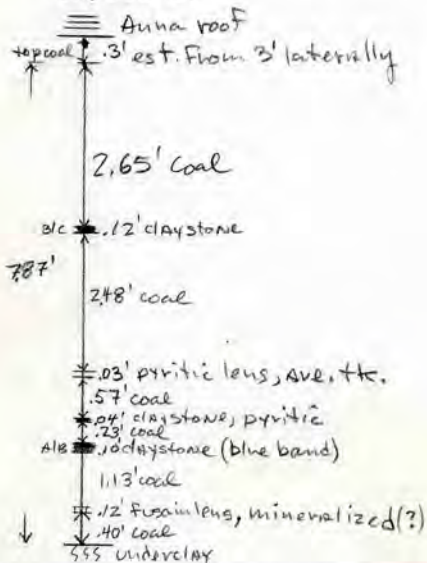
3rd N. panel off 3rd W. (Area 904)

A. This is a super unit driving a panel north off the 3rd W. submain, on the extreme N. end of the mine. We parked at 62 c/c and walked North. Entries are 24' wide and now are on 75' centers (were using 84' centers). The ribs are solid (no splits) and the mining conditions are excellent.

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Brereton is usually 2-3' up and up to 16' thick; 4' bolts ("pins") are being used here. Jeff mentioned that they had a trough-shaped area of thick coal (to 11') in this mine. I started to chip an exposure at 64 c/c but we left; see C. below. Around 66 c/c we saw jointing in Anna running roughly N60°E.

B. Near the face at vic. 72 c/c (5400' N. in panel) I did a quick description of fresh exposure:

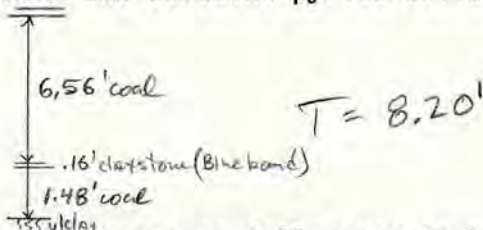


T = 8.17

Band	th.
C	2.95'
B	3.47
A	1.75

Mark measured 7.5' (90") at a nearby exposure. Nearby they were using a laser to align belt and track entries; they shine it through a clear plastic curtain on to the top of the coal. Moving back toward 64 c/c we saw a small Brereton boss with a surrounding fall. Boss is about 1½' deep in an area of 0.4' Anna and 0.3' clod.

- C. Returned to chipped spot at 64 c/c to get coal thickness of 8.20'. Anna roof is a minimum of $\frac{1}{2}'$ thick and contains pyrite dollars.



So far we have seen no falls over 1' high, no Energy Shale lenses, and only rare spots of bastard limestone. Jeff indicates the Energy lenses' area mid-mine phenomenon, so this area is similar to much of Monterey No. 1.

- D. At 62 c/c I collected a parting (-B-1) in the Herrin, consistently 0.12' thick. Its base is 3.14' above the blueband, so it is likely the B/C parting found regionally.

- E. On submain at 1st N. panel we looked at floor in an undercast; $2\frac{1}{2}'$ of med. gray underclay, friable at top; below this it is calcareous and tough, but no ls. nodules were reached.

1st W. Submain off N. Mains (Area 901)

We went S. to Unit 12 where Jeff needs to visit to check roof falls; this is very near area visited in Dec. Jeff showed miners on section how to look through borehole scope.

Saw:

Interpretation:

gap at 2' up
gap at $5\frac{1}{2}'$ up
mud at 7' up

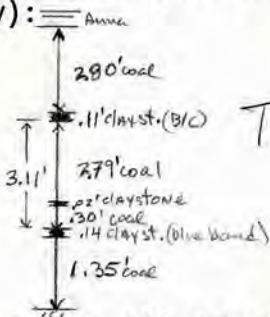
Gap in Anna Shale
Gap in or on top of Brereton
perhaps Jamestown interval

Area has continuous Conant Ls. around 8' up which has caused torquing problems with bolts--it is

FORM 180 W

continuous over Energy lenses also. Anna can be seen to be at least 2' thick and has 1' diam. Anna concs. at the base.

F. We went N. to return side of Mains, to a site 3 c/c N. and 3 c/c W. of the fall we revisited. I did a quick description (major ptngs. only):



Bench	Thks.
C	2.80'
B	3.22'
A	1.49'

1st/2nd S. panels off Main E. (Area 905)

G. Large fall (9' max.) exposes 6' of Brereton and ends within Brereton. Bottom 3' of ls. shows paper thin laminations of plant fragment along subhorizontal bedding planes; it does not look like rooting. Jeff says this is a mappable facies of uncertain distribution. The whole intersection fell pulling 4' bolts; area rebolted with at least 5' bolts and fall with 8' mechanical bolts (5/8" diam.); fall occurred 3-4 months after mining. Full sequence is:

- 6'+ Brereton Ls., as above
- 2.6' Anna Shale, finely laminated, phosphatic
- 0.15-0.4' Bs. Ls. at base (-B-2)
- Herrin Coal

Small slips seen in Anna and into base of Brereton were a contributing factor to the fall.

1st W. off S. Main (Area 906)

H. Fall at intersection of 16' wide entries. At top is odd shaped protrusion from base of Bankston Fork; considered to be a small "boss" composed of bioturbation tubes (occasionally seen on base of Brereton). Where described an Energy lens has wedged out:

- irreg. base of Bankston Fork
- ca. 5' Lawson shale, bioturbated from above
- ca. 1' Conant Ls. in contiguous nodules
- trace Jamestown horizon, coaly
- (No Brereton)
- ca. 2' Anna with 'clod' or bioturbated zone at top
- Herrin Coal

I. We walk past a small fall (in and out for H.) elongated N-S all in Energy Shale and a maximum of 2½' high along the rib line. Behind it in c/c is a larger fall which has progressed into the altered Lawson and has a 8' slip plane which Mark noted. I collected the bottom of Energy (.05'-.4' up) for analysis (-B-3). I also collected siderite(?) nodules from the Energy/Herrin contact for XRD analysis (-B-4).

Discussion

We saw only 3 major falls which received numbers; lesser falls were not numbered. Two of these involved missing Brereton; the third (at G.) involved a failure of the lower part of the Brereton. We were told that falls in general were uncommon in the mine, and failures of part of the Brereton were rare.

The focus on only the highest falls makes it difficult to generalize about general roof stability. Certainly the least stable immediate

FORM 180 W

roof is Energy Shale due to multiple medium-angled faults. Anna is more stable, but it weathers differently in some areas (probably due to regional facies differences), and is unstable where slip planes have developed around Brereton "bosses", around Anna concretions, or for uncertain reasons, as at G. Failure of thick Brereton was also seen (for the first time in my experience); this is apparently unusual but also seen in area 903.

Samples Set "B" begun (-1 to -4)

- B-1 (D) Herrin parting (prob. B/C in regional framework) 3.14' above blueband, 0.12' thick.
- B-2 (G) Bs. Ls., calcareous, black (block)
- B-3 (I) Energy Shale (0.05'-0.40' up); dark gray showing some weathered sulfates; color is N3.
- B-4 (I) Siderite(?) nodules from Herrin/Energy contact for XRD

ISGS Mine Notes - Monterey No. 2 - Clinton Co.

Visit: Sept. 19, 1990 by Phil DeMaris,
and Wayne Frankie, escorted by
Jeff Padgett, Roof Control Specialist

Coverage: Introduction
Sampling in 14th E. panel off N.
1st W. Main off N. (Unit 1)
Samples: Set B con't. (-5 to -16)

Introduction

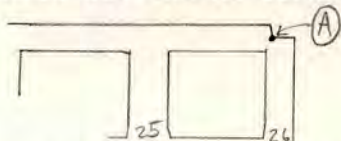
Purpose of visit was to collect samples of the thickened blue band on the near-Walshville side of the mine, and also as it thins to the west, becoming a more normal thickness. Secondary purpose was to see some of the Energy Shale lenses present in the roof which Jeff has mapped in the past.

Sampling in the 14th E. panel off N.

We entered the 14th E. panel off the N. Main which was worked by unit 2. They mined a north arm first, and then mined east, producing an "L" shape; the panel is roughly 6 months old.

A. (See map A) We went all the way east to 26th room at N. rib which was the NE corner of the panel.

Detail:

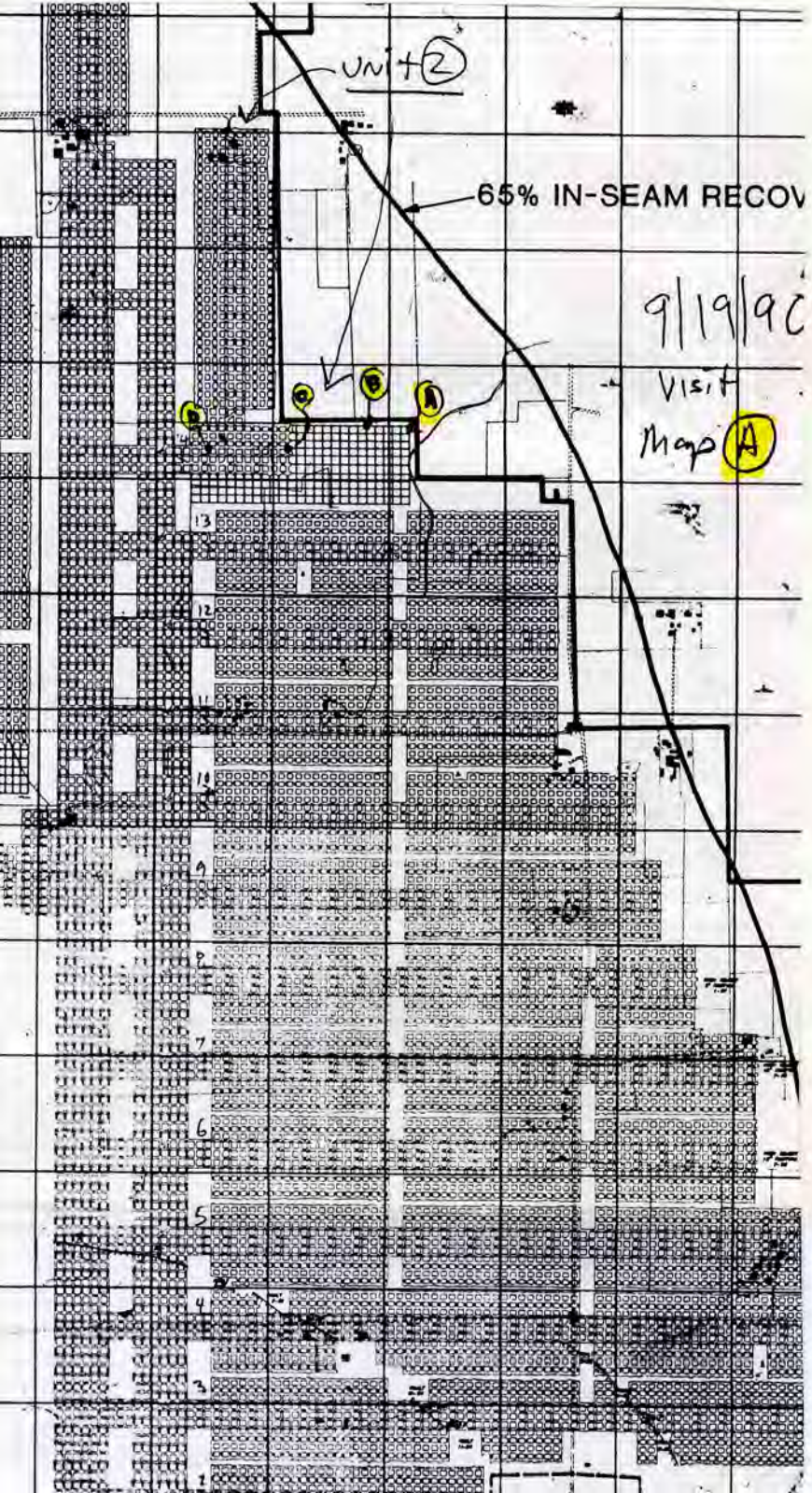


The blue band averages 0.50' thick here, is medium to light gray, is slickensided, and contains small pyritic zones which contain pea-to-almond sized pyrite nodules. Slight post-mining squeezing of the blue band has occurred so only rough zonation can be done. I



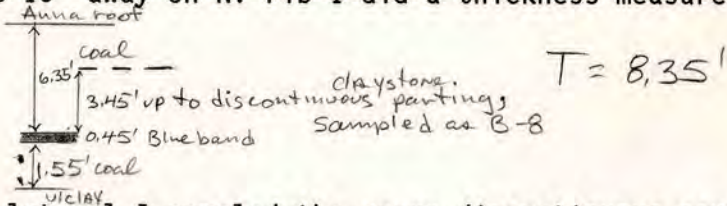
9/19/90

Map A



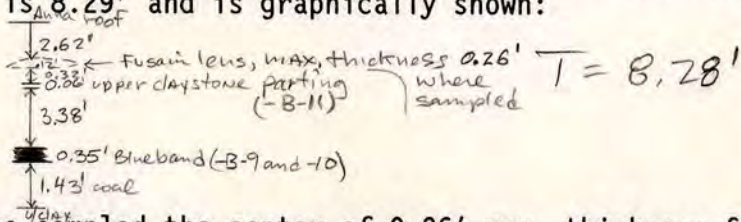
collected a bulk sample (B-5), a top of band (0.25') sample (B-6) and a bottom of band (0.28') sample (B-7) where the blue band was 0.53' thick and 1.5' above the underclay.

About 10' away on N. rib I did a thickness measure:



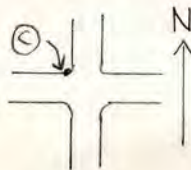
Just lateral I sampled the upper discontinuous parting where it was thicker (B-8).

B. We traveled west to 21st room at N. rib. The blue band was more coherent here, was perhaps less pyritic, and it averaged about 0.35' thick. I collected bulk samples of the top 0.20' of the blue band (-B-9), the bottom 0.15' of the blue band (-B-10), the upper parting which is 0.06' thick (-B-11). Coal thickness here is 8.29' and is graphically shown:

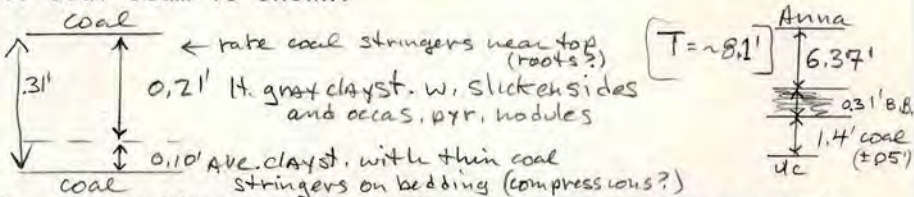


I also sampled the center of 0.26' max. thickness fusain lens (-B-12) which is 0.32' above the upper parting, and the top 0.2' of the underclay (-B-13).

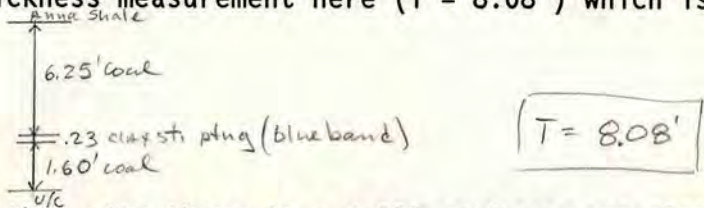
C. We continued west to the 12th room at the 1st left entry, and collected a sample of the blue band on the NW corner of intersection. The blue band is 0.31'



thick where bulk sample was collected (-B-14); thickness of coal seam is shown:



D. We continued west to the 3rd room at the 1st Left entry, where I collected a bulk sample of the blue band where it is 0.23' thick (-B-15). I did a coal thickness measurement here ($T = 8.08'$) which is shown:



At this site there is a 0.03' carbonaceous claystone band at "Steel band" position 0.4' above blue band. This completes a set of 4 sites over a roughly 1760' traverse.

We left the panel and while we traveled Jeff suggested a research project which might be of use to industry. He suggested that work be done on the correlation of gamma log responses for underclays with moisture % and other physical properties. He has seen some match-up of gamma response and moisture % in holes he has looked at, and believes this might be a useful tool.

First W. Main off N.

We went into an active section (Unit 1), which is mining main entries due west, and is advanced about 10 c/c further than the map indicates (see map B) and are thus ready to stub the 3rd S. panel neck.

E. Near the face there is Energy Shale roof which is unstable. The bolting plan here is to bolt through Anna concretions and all shale below the Brereton Ls. They have "wings" on the bolter which gives some protection. The Energy Shale has bad falls in N-S directions, but also falls in E-W direction to a lesser extent. Here they use 6' B-bales on entries and crosscuts with an additional 9 x 8' B-bales at each intersection. They use plastic sleeves on all bolts in poor areas on long-life entries. These sleeves are expensive but effective--they are the only ones in U.S. doing this.

For regular mechanical bolts a minimum 4' Ls. is required (60" mech bolts used). If 3' or less Ls. is hit they use 6' resin bolts which generally topout in base of Lawson or upper Conant Ls.

I collected the top 0.4" of underclay between Main 1 and 2 at c/c 34 (-B-16) for XRD analysis.

We examined the edge of an Energy lens which showed a 15-18° contact angle. Jeff commented that clay dikes are seen up to 1-2 c/c away from the edge of the Energy lenses in several cases, and Jeff believes there is a causal relation. This matches my observations in Freeman Crown II where this has locally been seen in N. Mains and recently in 1st W. off N. Main. This setting, where dike material is likely Energy shale itself, might be a good one to research thoroughly.

Samples: Set B con't (-B-5 to -16)

- | | | |
|-------|-----|------------------------------------|
| -B-5 | (A) | Bulk of blue band where 0.53' tk |
| -B-6 | (A) | Bulk of top 0.25' of blue band |
| -B-7 | (A) | Bulk of bottom 0.28 of blue band |
| -B-8 | (A) | Bulk of upper parting, carb. shale |
| -B-9 | (B) | Bulk of top 0.20' of blue band |
| -B-10 | (B) | Bulk of bottom 0.15' of blue band |

- B-11 (B) Bulk of upper parting, very carb. shale, where ave .06' thick
- B-12 (B) Fusain from center of large fusain lens in Herrin with base 0.32' above upper ptng.
- B-13 (B) Top 0.2' of Herrin underclay (bulk), some weathering
- B-14 (C) Bulk of blue band where 0.31' thick
- B-15 (D) Bulk of blue band where ave. 0.23' thick
- B-16³ (E) Bulk of top 0.4' of Herrin u/clay, lt. to med. gray

ISGS Mine Notes - Monterey No. 2 - Clinton Co.

Visit to Carlinville Office by Phil DeMaris and John Nelson on Oct. 10, 1991

John Nelson is visiting Jeff Padgett of Monterey to discuss possible thrust faults in the Monterey No. 2 property. Jeff had a list of about 30 drill holes in this property with repeated Danville Coal or Piasa Ls. sections, and he said triple Danville sections did occur.

He showed us a cross section crossing the slope and nearby holes; Fred Newman's sketch of slope exposures shows thrust over thickened Gimlet ss. where Piasa is cut off. Thrust in slope between C-2 and C-3 strikes roughly NW-SE, but he indicated detailed confirmation by Newman was needed.

The Trivoli ss. caps a rotated section in M2-C-8 where both the Danville Coal and Piasa are missing. Units as high as the Gimlet remain parallel to the Danville in the hanging wall.

Jeff indicated that Dennis Murphy (Houston Office) is interested in faults of all kinds in the Monterey properties and would be happy to cooperate with us. John acknowledged the companies interest and indicated he would be looking further into this area. John was given a few core descriptions and a map of the slope-area drill holes (I believe) to take with us.

**MONTEREY COAL TO BUYOUT EMPLOYEE JOBS;
\$12,000 LUMP SUM OFFERED TO MINERS**

Coal Week

Nov. 12, '90

The second-largest underground mine in Illinois — **Monterey Coal Co. No. 2** — plans an unusual work force reduction next year. The Exxon Coal USA subsidiary wants to eliminate about 200 jobs by next spring and is offering to “buy out” as many as 100.

Veteran employees, probably those with at least 10 years seniority, will receive lump-sum payments of \$8,000 apiece if they leave voluntarily. If they choose not to continue their company-paid medical insurance, they will pocket another \$4,000. On a smaller scale, a similar buyout was attempted last year at Monterey's No. 1 mine and was successful. The company also has used it for salaried personnel.

The company blamed the need to trim its work force on a reduced

demand for high-sulfur coal. All of the coal produced at Monterey 2 goes to PSI Energy's Gibson Generating Station near Princeton IN.

COAL Jan. 1991

Monterey Coal plans voluntary reductions

Monterey Coal Co. is planning a major work force reduction next spring at its No. 2 underground mine at Albers, Ill., but the Exxon Coal U.S.A. subsidiary hopes a "voluntary separation program" will eliminate or reduce the need for layoffs.

Tom Torget, an Exxon spokesman in Houston, said Monterey will be consolidating operations at No. 2, "which will result in a work force

reduction of about 200 employees by April 30, 1991." To prepare for the cutback, the company initiated a three-month voluntary separation program in November.

For the three-month period ending Jan. 31, employees who are members of the United Mine Workers of America have the opportunity to voluntarily elect to leave the company. Those who choose to do so will receive a schedule of benefits. If the voluntary program results in a sufficient number of employee reductions to eliminate what Torget described as "surplus staffing" at the No. 2 underground mine, then involuntary reductions of the staff won't be necessary next spring.

Here's how the program works: If a UMWA-represented employee leaves voluntarily by Jan. 31, he will receive a lump-sum payment of \$8,000. If layoffs become necessary, those employees who lose their jobs will have a choice of receiving 12 months of company-paid insurance or a \$4,000 lump-sum payment but no insurance.

"We hope to get 200 people to leave voluntarily," said Torget. In addition to severance benefits, employees will receive job counseling and other assistance.

Torget blamed the planned cutback on the company's need to reduce costs, "given that we're producing high-sulfur coal." The sulfur content at No. 2 averages 3.34%. He did not indicate, however, that the reduction is directly related to congressional passage of the Clean Air Act, which contains legislation aimed at reducing sulfur dioxide emissions.

Monterey No. 2 currently has about 650 employees. The company also operates another underground mine in Illinois—Monterey No. 1 at Carlinville. It has about 425 employees. Monterey No. 1 underwent a similar job reduction in late 1989. Hourly workers at the two mines are United Mine Workers of America members.

Monterey No. 2, one of the nation's largest underground mines, produces nearly 3 million tons of coal a year, most of which is sold under long-term contract to PSI Energy in Indiana. Monterey No. 1 supplies coal to the Central Illinois Public Service Co. □



FORM 180 W

SAMPLE HISTORY

Plant sampled: **Monterey No 2** Date: **1/4/932**
 Company: **Monterey Coal** Sample ID: **Monterey 2**
POB 496, Carlinville, IL 62626 **C32779**
 * **Jerome D. Goodrich, Jr., pres.**
 Company representative: **Mike Kaufman, Quality Coordinator**
217-854-4240
Maurice Spiehlmann, Prep. Mgr, 618-248-5121,ext 208

Mine (source of sample): **No. 2** Collected by: **RDH & RRR ***

Seam identification: **Herrin** Time of closure: *****

Mining period represented (dates): **12/18-19/92**

Panel(s) & location(s) in mine:
 Mine locations (descriptive):
Most production was 1 mile W of Albers, some was 2 miles SW of Albers and a little was from 3 miles NW of Albers, all in Clinton Cnty

$\frac{1}{2}$ or footage section	twp	rg	
10	1N	5W	(3 mining units)
16	1N	5W	(1 mining unit)
27	2N	5W	(small unit)

Type of Preparation Plant:
See description and flow sheet in booklet filed under Monterey in Coal Section office. McNally jigs and crib cyclones, centrifical driers

Sampling point: # increments: *****
 Belt (describe position in plant)
Off main belt carrying product coal to train loading dock
 Train Truck

Company's sampling device (yes / no) **YES**
 Type: **Primary and secondary sample cutters with crushers**
 Other (describe)

Procedures (describe other aspects)
 * **Sampling done by Monterey staff as part of their regular quality control sampling procedure.**

5/92
PJD**COMPLIANCE**

Coal Week May 4, 92

**PSI REVEALS COMPLIANCE COSTS;
MONTEREY PACT TO COST \$25 MILLION**

PSI Energy says it may cost as much as \$25 million to renegotiate a long-term contract with Exxon Coal USA to reduce the amount of coal supplied and/or to obtain coal with a lower-sulfur content.

The Indiana utility's estimate is contained in an environmental compliance plan filed last week with the state Utility Regulatory Commission in Indianapolis. PSI expects to spend about \$1.2 billion to comply with the amended Clean Air Act.

PSI receives 3 million t/y high-sulfur coal from Exxon's Monterey No. 2 under an agreement that expires Dec. 31, 2002. There is an option to extend the pact through 2007. Last October, PSI filed a federal suit against Exxon claiming they failed to meet quality and quantity specifications under the contract. Exxon claimed PSI breached the contract by failing to accept substitute coal and not making timely payments on disputed coal invoices. A Nov. 1, 1993 trial date has been set.

Daniel L. Rimstidt, manager of fuels and mining planning for PSI, said in URC testimony that PSI exercised and that the process is under way during a reopener period that closes in July. He said Exxon offered a lower price in July 1991 but that Exxon later retracted that offer and submitted a higher price "without an explanation of the escalated provisions." No prices were disclosed in the PSI filing.

The projected "reformation" or renegotiated costs for the Exxon contract "constitute the estimated cost range to reform such agreement to reduce the quantity of coal to be supplied and/or to obtain coal with a lower sulfur content," Rimstidt said.

Exxon spokesperson Tom Torget would not comment on the accuracy of the maximum \$25 million renegotiated cost cited by PSI. "As to the status of negotiations, we are continuing to meet with PSI to negotiate a new price on a contract, which will be effective Jan. 1, 1993."

DJD
6/2/92**PSI SEEKS \$7/T CUT AT GIBSON;
ASKS JUDGE TO BACK EXXON REOPENER**Coal Week
May 19, 1992

PSI Energy has asked a federal judge in Indianapolis decide whether PSI can compel Exxon Corp. to cut the contract price of coal from its Monterey No. 2 mine by \$7/t or to stand aside if PSI wants to transfer the contract to Black Beauty Coal.

On May 13, PSI filed suit for a declaratory judgment in the U.S. District Court for the Southern District of Indiana against Exxon. Asking the court to uphold its interpretation of a reopener clause the utility's 1974 contract to purchase coal from Monterey 2. PSI claimed the clause allows PSI to renegotiate the price, including escalation provisions. The contract runs 2002 with a five-year option.

PSI claims that negotiations with Exxon have failed to produce an acceptable agreement, so it took bids on replacement coal for its 3,158-mw Gibson plant for delivery after Jan. 1, 1993. Black Beauty Coal Co. of Evansville IN offered to supply 3 million t/y more than \$7/t less than Exxon's latest offer. Because PSI says Exxon has indicated it might question the validity of any competitive offer, the utility is asking the court to determine that the offer is valid and that if Exxon fails to match the offer the current contract will terminate as early as Dec. 31, 1992.

Exxon spokesperson Tom Torget said the Houston-based company would have no comment on the suit. Black Beauty officials could not be reached for comment.

PSI WINS COURT VICTORY OVER EXXON; TO SWITCH FROM MONTEREY TO BLACK BEAUTY

PSI Energy has won court approval to sever its long-term coal supply contract with Exxon Corp. in a move that could spell dire consequences for Exxon's Monterey No. 2 mine in western Illinois but could be good news for Black Beauty Coal's mines in Indiana.

In a Dec. 28 ruling, US district court judge Sarah Evans Barker said PSI's contract with Exxon gives the utility the right to accept a competitive offer from another supplier, in this case Black Beauty. The PSI/Exxon accord has a reopener provision that allows the parties to renegotiate.

PSI argued it could seek competitive offers and, if it received any, would have to give Exxon an opportunity to match it. PSI said Exxon failed to meet Black Beauty's offer for coal about \$15 cheaper than what PSI paid Exxon in 1992. Exxon claimed PSI could not seek outside offers.

But the judge sided with PSI, asserting that Exxon's contractual interpretation, if adopted, "would shift far too much risk onto PSI by creating a barrier to competition that few coal suppliers could overcome. The court can find no language in the agreement that would warrant impeding market competition in this way."

Robert Veenstra, PSI's vice president of fuels and mining, told *Coal Week* the utility planned to stop purchasing coal from Exxon's **Monterey 2** underground mine as of Dec. 31, and would begin accepting shipments from Black Beauty. How much PSI buys from Black Beauty in early 1993 will depend largely on whether Exxon appeals Barker's ruling.

Eventually, PSI plans to buy approximately 3 million t/y from Black Beauty, Veenstra said. Even if there's no appeal, it may take Black Beauty some time to work up to that supply level, and PSI may have to buy some spot coal in the interim.

Exxon spokesperson Ed Markowski said the company was "extremely disappointed" in the ruling and was considering its options, including a possible appeal. Exxon has 30 days to appeal.

Veenstra said the ruling was a "total victory" for PSI, its rate payers and for Indiana coal, since Black Beauty operates three mines in the Hoosier state. If PSI buys 3 million tons annually from Black Beauty, it would save about \$45 million a year, or some \$450 million over the next 10 years, he said.

Not only is the Black Beauty coal less expensive, it also is lower in sulfur content than coal from Monterey 2, Veenstra pointed out. Markowski said Monterey 2 is "still shipping coal," adding Exxon is examining its options for the mine.

Coal week - 12.21.92

PSI REVEALS MONTEREY BUYOUT; UTILITY TO REIMBURSE BLACK BEAUTY PAYMENT

PSI Energy is seeking Indiana Utility Regulatory Commission approval to "subsidize" a \$151 million contract buyout fee paid by Black Beauty Coal Co. to Exxon Coal USA, whose long-term coal supply contract with PSI was terminated earlier this year.

PSI, a subsidiary of Cincinnati-based Cinergy Corp., announced in August it had agreed to purchase as much as 3.3 million t/y of coal from Black Beauty over 10 years (8-12-96 *Coal Week*). The accord replaced a PSI pact with Exxon's Monterey No. 2 underground mine at Albers IL that began in 1977 and was scheduled to expire Dec. 31, 2002.

Until now, PSI has not disclosed the buyout fee, although the utility previously estimated its ratepayers could save up to \$80 million over the initial 10-year period under the Black Beauty deal.

In documents filed last week with the IURC, PSI said it has signed two coal supply agreements with Black Beauty "and certain of Black Beauty's affiliates" for the supply of approximately 3 million t/y of coal. These agreements provide for the payment by PSI of a buyout fee of \$151,105,662 plus interest of \$27,952,938. "This represents the fee paid by Black Beauty to Exxon," PSI said.

Under terms of the PSI/Black Beauty agreement, "the price of coal paid by PSI will include a monthly buyout charge which will be paid through December 2000," the utility said. The charge, which is intended to cover the PSI/Exxon agreement buyout fee, includes interest on any unpaid principal balance.

A PSI spokesperson said the utility's 3,145-Mw Gibson Generating Station has begun receiving coal from Black Beauty. At present, the coal is being trucked from Black Beauty mines in southern Indiana. Eventually, "we may go to rail, but it depends on the economics of the transportation agreement," she told *Coal Week*.

The spokesperson said the buyout transaction was structured so that PSI would subsidize Black Beauty because of economics. "The deal was more attractive if you could package the coal supply costs with the buyout costs," she said.

PSI also decided to let Black Beauty negotiate the buyout with Exxon because PSI and Exxon already were engaged in negotiations under a reopener provision in their contract and it "would have complicated matters for us to also be in buyout discussions with them," she added.



Mine **EXXON, PSI MOVE TO SETTLE CLAIMS;
COURT SESSIONS CANCELED**

Oper Exxon Coal says no operational changes will occur at its **Monterey**
No. 2 underground mine near Albers, IL, following a recent
Oper **settlement with PSI Energy that puts to rest two pending lawsuits**
between the coal company and the utility.

Ent Trials set for Aug. 22 and November were canceled after
Dep

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Exxon and PSI resolved Exxon's claims about tonnage not taken as a result of a US District Court ruling in late 1992 as well as a Monterey 2 coal quality and accounting dispute raised by PSI.

The **disagreement** between PSI and Exxon **erupted in 1991**. Following a series of court rulings and appeals, the two agreed to non-binding mediation that resulted in the settlement. No details were disclosed by either side, although Robert Veenstra, PSI vice president of fuels and mining, said the accord represents "a good resolution for PSI's customers and shareholders."

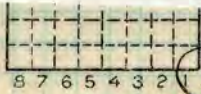
Exxon spokesperson Tom Torget said Monterey "looks forward to continuing its relationship with PSI as a responsible, reliable coal supplier." He said **Monterey** intends to **continue selling about 3 million tons of coal annually to PSI** through the balance of the contract, which is scheduled to expire at the **end of 2002**. Torget declined comment on what might happen during the next contract reopener, which reportedly is due in a couple of years.

A three-year battle between Exxon and PSI over the contractual price for Monterey 2 coal ended earlier this year when the US Supreme Court refused to hear PSI's appeal of a lower **court ruling** that set the price at **\$30/t** instead of the \$23.26/t PSI was seeking. PSI had been paying about \$38/t before it invoked the contract reopener provision in 1991.

Exxon sued PSI for breach of contract last year because it was forced to close Monterey 2 for several months after PSI, acting upon a federal judge's ruling, canceled the contract and began buying replacement coal from Black Beauty Coal of Evansville, IN. The court ruling eventually was overturned by the US 7th Circuit Court of Appeals in Chicago and PSI resumed shipments from Monterey 2 last summer.

Quad. *Coal Week*
County *8-15-94*
L.—SURFACE SHEET (Geol.)

Part



Index No. *0195*

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W.

PSI BUYS OUT EXXON CONTRACT; PRODUCER TO CLOSE MONTEREY 2

Exxon Coal USA will end production July 19 at its Monterey Coal Co. No. 2 mine near Albers IL, following tentative agreement announced last week of the pending termination of its 3 million t/y high sulfur (3.4 percent) coal supply contract with PSI Energy.

A mine source said the contract had been bought out by PSI, but Exxon officials were loath to use the term. The source said the mine production was dedicated solely to filling the PSI contract, which would have run through the year 2002.

A PSI spokesperson said, "We have a contingent agreement with Exxon to terminate the contract, but it is not final and it is dependent on another agreement we are pursuing with an alternative supplier, and it is also contingent upon parts of it getting regulatory approval."

"This is expected to result in permanent closure of the mine when these agreements become final in early August," Exxon said. "Recent extensive studies by Monterey of the competitive conditions in the high sulfur coal market have confirmed that extensive operational changes and improvements would be necessary at the No. 2 mine to remain competitive," Exxon said. "Given the conclusions of the studies, Exxon Coal USA has determined that the proposed contract termination is the most economic alternative. Thus, the company has made a business decision to accept the current offer to terminate its existing coal supply contract with PSI (and) without the current contract, continued operation of the mine is not viable long term and the mine will be closed," Exxon said.

Closure of the mine will result in the loss of jobs for about 330 represented employees and 65 salaries employees. Some 80 employees will be needed for about four additional months to salvage equipment and close the mine, with a few retained further for surface reclamation compliance. Monterey officials plan to meet with UMWA local and district representatives to provide for the orderly closure of the mine and to discuss the closing's impact on union employees. Medical insurance will be provided for up to one year after termination, Exxon said.

According to Monterey's general manager, Peter Graham, Monterey will continue to operate the Monterey No. 1 mine, located near Carlinville IL, some 45 miles south of Springfield IL. Longwall mining equipment has recently been introduced there and the mine's coal prep plant is being upgraded to increase production from 2.6 to 3 million t/y.

The No. 1 mine produces mid-sulfur (1 percent) which is purchased primarily by Central Illinois Public Service Co.

From
Coal
Beek
Jy 8,
1996

Coal Age, March '97:

Freeman terminates Monterey negotiations

Freeman United Coal Co. has broken off negotiations to buy Exxon Coal USA's Monterey Coal Co. No. 2 underground mine near Albers, Ill., eliminating what may have been the best chance to reopen the mine that closed last July following the termination of its 3 million ton-per-year high-sulfur coal supply contract with PSI Energy.

Donald Dame, director of human resources and community relations for Freeman, confirmed the Springfield, Ill.-based company is out of the Monterey No. 2 picture. "We have no plans to do anything...we have no plans to continue pursuing it," he said.

Neither Freeman nor Exxon would indicate what went wrong, although an Exxon representative implied his company has yet to receive a satisfactory offer for the mine. Freeman and Exxon began Monterey No. 2 negotiations last fall.

"We continue to be willing to make a deal if we can get an offer that's acceptable," said the Exxon representative. He added that other companies had expressed interest in Monterey No. 2.

According to the representative, Exxon continues to keep Monterey No. 2 ready to resume operations if a buyer is found. "The electricity is hooked up and we're still pumping air through it, although not as much as when the mine was open," he said. However, the company also is moving forward with a reclamation plan that would be implemented later this year if no buyer steps forward.

BID FOR MONTEREY 2 FAILS; MINE WILL BE PERMANENTLY CLOSED

An unusual effort originated by the St. Louis family of multimillionaire Fred Saigh, a former owner of the St. Louis Cardinals professional baseball team, to reopen Exxon Coal USA's Monterey No. 2 underground mine near Albers IL has ended in failure, and the mine now will be permanently sealed. Under the Saigh family's direction, several proposals were floated to save Monterey 2, which closed last summer after PSI Energy, its only customer, bought out a long-term contract to supply 3 million t/y of high-sulfur coal to the Indiana-based utility.

The Saigh family got involved after hearing news reports about the loss of more than 400 jobs with Monterey 2's closing (2-24-97 Coal Week). Over the past several months, three sale offers were made to Exxon. All were rejected, the latest within the past few weeks.

over

Cont.

It boiled down to money, Exxon spokesman De McLallen told Coal Week. "What they were offering ... we felt we would get more value out of the assets by selling them off. They weren't prepared to offer us the salvage value" of the property, he noted. Another sticking point was Exxon's insistence that any buyer assume responsibility for the mine's environmental liabilities. Coalfield sources say Zeigler Coal Holding Co. has expressed an interest in Monterey 1, but McLallen said he has no knowledge of that.

McLallen said Exxon will entertain no more offers for Monterey 2. "We're proceeding with plans to close the mine permanently," he said. The first step is to halt ventilation and pumping. The mine is expected to be sealed later this summer.

- Exxon still operates the Monterey No. 1 underground mine at Carlinville IL.

COAL WEEK • JUNE 23, 1997

The Indiana Municipal Power Agency has withdrawn a protest filed with the **Federal Energy Regulatory Commission** (FERC) in late 1996 (10-7-96 *Coal Week*) over **PSI**

Energy's recovery of a \$151 million coal contract buyout fee paid to **Exxon Coal USA**.

PSI sought permission from FERC to recover from its customers, including IMPA, costs associated with the buyout. IMPA, which supplies power to 31 Indiana municipal electric systems, buys electricity from PSI and owns a 24.95 percent stake—or about 156-mw—in Unit 5 at PSI's 3,145-mw Gibson Generating Station near Princeton IN.

In September 1996, PSI signed two coal supply agreements with **Black Beauty Coal Co.** for the supply of approximately 3 million t/y of coal through the year 2015. The agreements provided for the payment by PSI of a buyout on an earlier contract of \$151,105,662, plus interest of \$27,952,938.

In its FERC petition, IMPA said the Exxon contract contained price re-opener provisions under which the price of high-sulfur coal from Exxon's Monterey No. 2 underground mine near Albers IL could have been adjusted in December 1999 to reflect market prices. Monterey 2 subsequently closed after losing the PSI contract.

IMPA president Raj Rao confirmed last week his power agency's protest has been withdrawn because it reached a settlement with PSI, a subsidiary of Cincinnati based **Cinergy Corp.** "We were concerned about how the costs of the (PSI/Exxon) settlement would be allocated to Gibson No. 5, ^(116.1) which is partly owned by IMPA," he explained. "Once we reached the settlement, we agree the allocations are proper."

Although Rao and PSI would not disclose terms of the settlement, Rao said it "does result in higher costs to IMPA on the purchased power side, but in the long term the total settlement is fair."

EXXON OFFERS PROPERTY FOR SALE

Exxon Corp. has put up for sale the land above its Monterey No. 2 coal mine in Albers, Ill., which the company closed in 1996, the *Belleville News-Democrat* reported.

"We are selling the surface property," said Wayne Barber, a commercial real estate broker for the Kenneth Johnson Agency in Belleville, Ill. He added that the mine may be difficult to sell.

Barber said Exxon has permanently sealed the mine, which local officials had hoped could be sold to another coal company and reopened. More than 200 miners lost their jobs when the mine closed.

"It cannot be used as a coal mine ever again," Barber said.

The mine was once one of the state's largest. In 1994, it was the fourth largest coal producer in the state. More than 3 million tons of coal were shipped out by rail that year. The Monterey coal was used

exclusively as the main fuel supplier for Indiana's largest utility before Exxon sold the contract.

From COAL AGE, 2/98

monterey #2

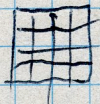
5/15/80

Dennis Murphy - Geologist
Andy Mandack

~~Channel Sample #1~~ : ^{30' in from} loc: ^{cut 62, entry 5}
Main North intakes; ^{or} 250' south and
550' west of NE corner of SW¹/₄, NE¹/₄ sec. 14,
T1N, R5W

C-21045

- Roof: shale; ^{dk} med gry, hard, pyritic; slightly carb,
pyrite finely disseminated; few ssds; num
pyr nodules up to 8" in diam; ls may be
close; small exposure near face; could be
a boss.; lamin bdy in spots; pyr band
mod cont between coal & shale.
- 0.20' coal: NBB, irreg interbed w/ roof shale,
very pyritic; (shale & pyr excluded from spec)
- 0.86' coal: NBB, hard, cleat indistinct; vitr-rich;
trace of cal & pyr;
- 0.03' Fusain: hard, w/ much fine grnd pyr; lenticular
- 0.48' coal: NBB, S.T.A.
- 0.01' Pyr: lenticular;



- 1.80' Coal: S.T.A. increase in dull attrital coal; cal on cleats; mod. dull; occas thin stringers of pyr.
- 0.09 shale: blk; hard, highly carb; locally grades to dull coal; contains thin strks vitr.; pyr lenses common near top; band cont but variable in thickness, (excluded from samp)
- 0.66' Coal: S.T.A.
- 0.02' Pyr & coal: Thinly inter lamin.
- 0.49' Coal: S.T.A. w/ little pyr on cleats.
- 0.05' Fusain: mod hard, no pyr; lenticular
- 1.84' Coal: S.T.A.; increasing dull bands; thin pyr stringers;
- 0.05' shale: med drk gray, hard, smooth; conts num pyr lenses; (excluded from samp)
- 0.25' Coal: NBB, vitr-rich; abndt cal on cleats;
- 0.31' shale: med drk gray at top, becomes drk grg down ward, hard, smooth, increas carb downward; vitr strks near base; pyr lenses common near top; (excluded)
- 0.63' Coal: NBB; vitr = dull; little cal or pyr.
- 0.12' Fus: hard, no visible pyr; very local lenses,

0.65' Coal: STA;

8.54' total

Floor + Clst: med drk gray, mottled, smooth, abundant carb material;

Entry 3 xcut 62,:

Gray shale: med silty; breaks in large (10'dia) concentric fractures w/ sharp edges; num coffin cover slips; hard & thinly lamin to massive.

F 3, xC 60:

Black sh rides up d over gray shale; ~ 3" zone of inter mix, rolling contact; some carb streaks in gray sh.

F 2 xC 62: Gr sh inclined gradually to NW; Numer long coffin covers (2 xcs long)

Channel Sample #2

Room 46 west (return)

3rd north Panel off main East or 40' south & 380' east of new corner of (C-21046) SE 1/4 NE 1/4, Sec. 13 T1N, R5W

Roof - Shale (Anne), black, hard, smooth, fissile, well-jointed in places, contains ^{limestone} pyritic concretions. Fairly continuous band of pyrite at base - sharp contact.

1.35 Coal, N.B.B., approx. 30% vitram, at least coal

is med. bright, numerous laminae of fusain, and some fusain lenses, numerous calcite-filled fractures, some calcite on the poorly developed cleats, very little pyrite.

- 0.03' Pyrite and coal; two bands of pyrite separated by 0.02' of coal [this is the upper split] continuous band
- 0.86' Coal, N.B.B. same as above. Vitrain laminae less than 0.02' thick in this unit.
- 0.01' Pyrite, hard, discontinuous.
- 0.75' Coal, N.B.B., same as above. Contains several thin pyrite streaks. Cleat better developed than above - still much calcite in fractures.
- 0.62' Claystone (major split) med gy, med soft, greasy luster but not definitely slickensided, crumbly, thin pyrite band near base. No disseminated pyrite or calcite visible. EXCLUDED
- 0.68' Coal, N.B.B., vitrain laminae thin (as above), contains ptgs. of fusain up to 0.01' thick, much calcite in fractures & cleats.
- 0.01' Pyrite, hard, discontinuous.
- 0.89' Coal, N.B.B., attrital coal is mid-lustrous. Vitrain less than 0.03' thick. Cleats better developed than above.
- 0.02' Pyrite, hard, discontinuous.
- 0.68' Coal, N.B.B. as above - less calcite.
- 0.02' Pyrite, discontinuous.
- 0.31' Coal, N.B.B., as above.
- 0.02' Pyrite, fairly continuous with ~~a middle band~~
- 0.01' Vitrain of ~~vitrain~~. continuous
- 0.01' Pyrite continuous

- 1.01' Coal, N.B.B., very little calcite or pyrite, cleats poorly developed. vitrain less than 0.02' thick. Generally thin banding.
- 0.58' Shale, dark gy to bk, contains numerous bands of vitrain, becomes laminated near base with thinner vitrain bands. EXCLUDED smooth, mod. soft, fissile.
- 0.39' Coal, N.B.B. has numerous thin pyrite ptgs. and vitrain banding is extremely thin, less than 20% vitrain.
- 0.01' Pyrite, discontinuous
- 1.03' Coal, N.B.B., thinly banded, less than 20% vit. Some calcite or fracture, cleats very poorly developed.
- 9.28' total
- F100 claystone, med. gy, smooth, soft, etc.

This coal said to be harder and to yield more "free" than coal elsewhere in mine.

Channel Sample #3: Loc. Unit 5 main S return Entry 7 (intake), xcut 68, 50' in by spac 2282 or 290' north & 420' west of SE corner of SW 1/4 Sec 24, T1N, R5W
C-21047

roof-shale: med to drk gray; finely lamin to massive; hard; smooth; numer marcasite[±], poorly develop; thin vitr. stringers; some ssds; some pyr concretions; pyr lamin between coal & shale;

1.20 - Coal: NBB; 30% vitr; attrital coal mic'lustrous; hard, cleat poorly developed; cal & little pyr in vert frac.

- 0.01 Pyr: fairly contin, but thickness varies
- 0.59' Coal: STA, few dull bands near base;
- 0.01 Pyr: Discontinuous;
- 1.69' - Coal: S.T.A.; one small pyr shale lens near middle; several pyr goatbeards; ~~near~~
- 0.02' - Pyr: hard, fairly contin; thin ^{dwr} shale streaks
- 0.77' Coal: NBB; S.T.A.
- 0.01' Pyr: discont;
- 0.11' Coal: STA w/ small pyr lenses
- 0.01' Pyr: discont;
- 1.68' Coal: NBB; middle mostly dull coal, less than 20% vitr; numer fus. lenses; upper & lower portions of unit similar to upper part of seam; trace cal on cleats; one small pyr lense near base.
- 0.08 Shale: gray-black, hard, highly pyr; large pyr lenses; (excluded from sample)
- 1.50 Coal: NBB, 30-40% vitr; more thinly banded than rest of seam; no minerals on cleats; several very thin pyr lamina near base;

Floor - G1st \approx med drk gray, soft, smooth, carb,
coaly streaks

7.68' total

Composite face - channel C-21048

Request no. R-16518