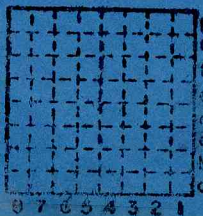


Freeman United Coal
Mining Co.

Industry Mine
Mine Index # 1002

Mc Donough County



Sec. 26

T. 4

R. 2

Index No.

34!

Freeman
Industry



Freeman United C.M.C. Industry Mine

Production Figures Year Tonnage

First production June 1982.

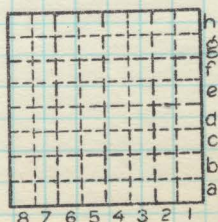
| | |
|------|---------|
| 1982 | 283,428 |
| 1983 | 498,296 |
| 1984 | 487,367 |
| 1985 | 532,127 |
| 1986 | 480,450 |
| 1987 | 456,988 |
| 1988 | 490,101 |
| 1989 | 515,813 |
| 1990 | |
| 1991 | |
| 1992 | |
| 1993 | |
| 1994 | |
| 1995 | 271,813 |
| 1996 | 532,585 |
| 1997 | |
| 1998 | |
| 1999 | |

12/17 ended 92-day strike! →

By Date

Quad. Part

County



Sec.

T. N.

S.

E.

R. W.

Index No.

In McDonough County June 1982

First surface mine begins operations

BY DELBERT ROBERTS
Journal News Editor

(First of a three-part series.)

INDUSTRY -- While most of the country has been experiencing industrial declines because of the economic climate, McDonough County has gained a new industry -- Freeman United Coal Company.

The first truckloads of coal rolled from Industry Mine in Section 26 of Bethel Twp. in early June, the beginning of a 10-year coal mining program developed by the company for this area.

Coal from the Industry Mine will provide the fuel for Muscatine Power and Light Company in Muscatine, Iowa.

While strip mining has been going on for years in nearby Fulton, Schuyler and Knox counties, the Industry Mine is the first of its kind in this county's history even though it has been known for years the county is rich in coal deposits.

Early settlers, primarily in the Colchester area, extracted coal by deep mining where they tunneled into hillsides. County history records that an average of 12 train car loads per day departed Colchester during the peak years. Annual shipments during the years of 1866-67 totalled 500,000 tons.

Don Tippey, Industry Mine superintendent, said the very first tree felled on the new mine site came during August of 1980.

A BIG percentage of the surrounding terrain is rough, hilly country covered with timber. In fact most of the five miles of haulage road from the processing plant to Route 101 was carved through dense timber.

Clearing of the timberland was contracted by an Iowa-based firm.

About the same time as the first tree was cut, dismantling of heavy machinery for use in the mine pit began at a Freeman mine near Banner in Fulton County. The machinery was transported during August of 1981 to the Industry Mine and re-assembled. Included was a 2,000 ton mechanical monster used in removing the overlay to reach the coal seam along, with a 40 cubic yard bucket which, Tippey said, "can dig your basement with one swipe."

The weather was a big factor during the construction phase -- a long, wet spring followed by a winter that everyone remembers.

The office area, repair shops, and processing plant were constructed on a "fault", which Tippey explained is an area where there is no coal seam below.

THE FIRST pit to be opened is about two miles from the processing plant, and again a fault area was utilized.

Located in a timbered ravine, all that was necessary was to clear away the timber and underbrush. The haulage road to the pit was constructed along the fault area at the bottom of the ravine. Driving into the pit one can see outcroppings of coal in nearby hillsides.

Tippey said the company currently has 2,600 acres under its 10-year mining program, but said it was doubtful all of the land would be stripped.

The company (then United Electric Coal Company) started buying strip-pable coal property in the southern portions of the county many years ago.

The mine superintendent said stripping has started near Grindstone Creek, which flows in a west-southwesterly direction through the township,

and will gradually work southward with the operation.

THE COAL seam, he said, is the same that is being worked by AMAX Coal Company at its Sunspot Mine near Vermont in Fulton County.

Freeman also owns property just over the line in Schuyler County, and the company plans to develop that area at some future date, according to Tippey.

(Next: Stripping and Processing.)



ONE BIG BITE -- A 40 cubic yard bucket shovel removes rock overlay from over the seam of No. 2 Illinois coal mined at Industry Mine. The seam is about two feet thick and the overburden in the surface mine area ranges from 20 to 65 feet. (Journal Photo by Delbert Roberts)



The wheel removes tons of dirt for two-foot coal seam

BY DELBERT ROBERTS
Journal News Editor

(Second of a three part series)



MOVING INTO PLACE — A 2,000 ton wheel, used to remove overlay from the coal seam at Industry Mine, is moved into place to begin operations. The large wheel (in foreground) swings over the overlay (left) and claws the material loose and transports it by belt system to the

opposite side of the pit where it is stockpiled. The monster machine maneuvers on huge crawlers and looms over the caterpillars used to move timbers into place for a crawler road. (Journal Photo by Delbert Roberts)

INDUSTRY — Buried beneath tons of overlay is a two-foot seam of "black gold" which Freeman United Coal Company will be extracting from the Industry Mine in McDonough County for years to come.

Getting to the coal is a major part of the strip mining operation. A huge machine, called "The Wheel" crawls into place after the timber has been cleared from the stripping area.

The machine sits in the pit area and the long extending arm with the wheel attached chews downward through the unconsolidated (loose dirt and soft matter) overlay. The material is then transported by a belting procedure the length of the overhead arm to the opposite side of the pit where it is deposited for future use — a distance of approximately 400 feet.

After the unconsolidated matter has been removed down to the rock formation (or consolidated matter), the 40 cubic yard bucket takes over and claws its way downward to the coal seam. The rock, mostly a shale or sandstone, is deposited adjacent to the unconsolidated material, serv-

ing as a retaining wall of the pit.

The heavy equipment normally uses the No. 2 Illinois coal seam as a base, but in some cases a special crawler road must be constructed for the 2,000 ton wheel to work from.

Don Tippey, mine superintendent, said the overlay in the Industry Mine ranges from 20 inches to 65 feet deep because of the rough terrain.

After the coal seam has been cleared, a second, but smaller 10 cubic yard bucket machine, loads the 100 ton haulage trucks which transport the coal to the processing plant.

At present only two of the large haulage trucks are in operation, but Tippey said later on four may be used.

The coal is stockpiled and augered into the plant where it is fed into a breaker machine. The coal is then sized, washed and then recrushed with the largest chunk no bigger than 1 1/4 inch in size.

During the process, rocks and other foreign materials are separated from the coal. The waste material exits the plant at another point and trucked back to the pit to be buried.

After the final washing, the coal is fed through a centrifugal dryer and stockpiled on the ground to await shipment to a river barge.

Water for the washing process is

pumped from a nearby 32-acre lake. After the rinsing, the water is piped from the plant to a settling pond. The coal residue settles in the deep pond and the water returns to the original lake through an overflow pipe to be used again.

Huge storage tanks were also erected in the office and repair shop area which contain water for drinking purposes and showers. Several wells were drilled in the immediate area to serve as a water source.

At present, the mine employs 57 union people from the local area — including two women who drive the big haulage trucks. In addition there are 10 company employees.

When the company advertised job openings last February between 3,000 and 4,000 people stood in line in Industry to apply.

While no immediate increase in employment is anticipated by the company, Tippey said eventually the mine may increase its payroll to 90 to 100 people as it reaches peak production.

The Industry Mine is the third strip mine the company has operating in the state.

Freeman operates Buckheart Mine near Canton and another one near DuQuoin. In addition they have five deep mine operations in southern Illinois.

(Next: Mine lifespan and reclamation.)

Illinois Department of
Mines and Minerals

FOR IMMEDIATE RELEASE
April 1, 1993

Contact: Liz March
217-785-0264

**RECLAIMED PRIME FARMLAND
EXCEEDS YIELD REQUIREMENTS**

SPRINGFIELD, IL - The Illinois Department of Mines and Minerals has released final bond on 74.5 acres of prime farmland at Freeman United Coal Mining Company's Industry Mine in McDonough County - a benchmark since Illinois' implementation of the Surface Coal Mining Land Conservation and Reclamation Act (Permanent Program) in 1982.

FORM 180 W



Coal week, 8/7/95: "Freeman... issued a WARN notice in late July for its Industry mine... Because of a continued weak demand for high-sulfur coal and the impact of the 1990 Clean Air Act Amendments, Freeman said production at Industry will be suspended indefinitely Sept. 15.

Of the mine's 74 employees, Freeman anticipates that approx. 13 will be retained beyond the suspension date to maintain the mine which has an estimated 8 million tons of proven coal reserves remaining. ... Industry has an approx. 200,000 ton stockpile, nearly half of its annual production."



FORM 180 W

Freeman United Coal Mining Co.
Industry Mine - McDonough County, Illinois.
July 5, 1983 - Notes by John Nelson on visit with
William DiMichele, paleobotanist from University of
Washington.

Surface mine in Colchester (No. 2) Coal.
Mine opened in 1982. Mine is located about 8 miles
southwest of the village of Industry.

Took 3 channel samples of coal. No
exclusions.

Sample #1

Sample taken at crest of small rise in coal
seam, approximately 1/4 mile from eastern end of pit.
Location: approximately SW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 26,
T.4N., R.3W., McDonough County, Macomb 15-minute
quadrangle.

Approximate section on adjacent highwall:

- 10' Sandstone, light gray, micaceous,
carbonaceous, fine-grained, thinly
laminated, distinct flaser bedding.
Sharp contact:
- 2' Mecca Quarry Shale, black, brittle, poorly
laminated, pyritic, contains marine fossils
(linguloid and pectinoid brachiopods) and
"pyrite trails."
- 10' Francis Creek Shale, light gray, silty
mudstone, with occasional small siderite
nodules. No fossils.
- 2.32' Colchester (No. 2) Coal, subdivided as below:



FORM 180 W

- 2 -

- 0.01' Shale, black, dull, brittle, pyritic.
- 0.65' Coal, bright banded, alternating vitrain and attrital (dull-banded) coal in laminae 0.01 to 0.04' thick; no fusain noted; considerable mineralization on cleat includes calcite, kaolinite and pyrite.
- 0.01' Fusain, soft, discontinuous.
- 0.37' Coal, like that above fusain but contains a few thin stringers of fusain near base. Much pyrite.
- 0.04' Fusain and bright coal, thinly interlaminated Tough, breaks in sheets. Not mineralized.
- 0.51' Coal, as above.
- 0.02' Fusain, soft, sheety, lenticular; locally pyritized. Discontinuous.
- 0.71' Coal, as above. Near middle of unit are numerous pyritic laminae that locally coalesce to form lenses. Much kaolinite on cleat.
- Floor - Claystone, medium gray to olive-gray, soft, non-silty, contains abundant fossil rootlets; lenses of pyrite along contact with coal.

The coal is only slightly oxidized by weathering. Cleat is weakly developed and the coal breaks into irregular blocky fragments. Primary direction of cleat appears to be N 45-60° E. Spacing is irregular, about 5 or 6 cleats per foot.



FORM 180 W

- 3 -

Sample #2

Approximately 500 feet west of Sample #1, near bottom of a swale in the coal. Location: approximately $SE\frac{1}{4}$ $NW\frac{1}{4}$ $NE\frac{1}{4}$, Section 26.

Highwall not cleanly exposed. Probable section:

15' Sandstone
2' Mecca Quarry Shale
6' Francis Creek Shale (as at Sample #1)

2.37' Colchester (No. 2) Coal, subdivided as follows:

0.55' Coal, bright banded, thin (0.01-0.02') alternating laminae of vitrain and attrital coal; a few stringers of fusain; abundant white calcite on cleat, some kaolinite and pyrite also. On top of coal are pyritized impressions of stems and bark.

0.01' Fusain, soft.

0.41' Coal, similar to above; less calcite.

0.01' Fusain, soft.

0.26' Coal, as above.

0.03' Fusain and bright coal, interlaminated. Not mineralized.

1.10' Coal, as above, pyrite common as partings and cleat facings, calcite less common than in top of seam. Near middle of this unit are several flattened irregular lenses of pyrite.

Floor - Claystone, as at Sample #1.



FORM 180 W

- 4 -

As at Sample #1, the cleat is widely-spaced and not very consistent in orientation. Coal is fresh - little oxidation.

Sample #3

About 1000 feet west of Sample #2. Coal seam is level or only slightly undulating. Highwall mostly covered with slumped debris, but local exposures show sandstone directly on the coal. Not sure whether this is the upper sandstone replacing Francis Creek Shale, or a sandy facies of the F. C. Shale. Location: approximately SW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$, Section 26.

- 2.40' Colchester (No. 2) Coal, subdivided as follows:
- 1.15' Coal, bright banded, rather blocky, much calcite on cleat, smaller amounts of pyrite and kaolinite. Few stringers of fusain. Vitrain and attrital coal in laminae up to about 0.02' thick.
- 0.15' Fusain, soft, clayey - fairly continuous layer.
- 0.70' Coal, bright banded, little calcite, quite a bit of pyrite as discontinuous partings, small lenses, and cleat facings.
- 0.05' Fusain, soft, fairly continuous layer.
- 0.35' Coal, bright banded, contains only a little calcite, no pyrite noted.
- Floor - Claystone, as at other two locations.



FORM 180 W

- 5 -

As at other two locations, cleat is widely-spaced and not consistent in orientation.

According to a miner we talked to, the coal is consistent in thickness and has few irregularities. The swale at Location 2 runs NE-SW and follows a valley on the surface, he said. It is the largest swale yet encountered. Depth about 10 feet, width 150 feet. Old underground works have been encountered in several places.

The only irregularities I noted in the coal, aside from swales and undulations of the seam, were a couple clastic dikes filled with light gray soft clay. No evidence of faults, and no tectonic joints.

The highwall is mostly covered with slumped material and few details are visible. The Francis Creek Shale reaches a maximum thickness of 10 to 12 feet, and apparently is eroded in the western part of the pit. The F. C. Shale is a uniform, finely silty light gray mudstone. A few plant fossils (Pecopteris, Neuropteris, and lycopod leaves) were found in F. C. Shale on the spoils. The overlying Mecca Quarry Shale is black, smooth, and poorly laminated; it contains nodules of siderite and occasional masses of septarian limestone. Overlying it with erosional contact is light gray-brown siltstone and fine-grained interlaminated sandstone, thinly bedded, and showing both planar laminations and flaser bedding. Plant compressions and coalified bark are concentrated along the basal contact.

The unconsolidated overburden averages about 15 feet thick and consists of yellow-brown to



FORM 180 W

- 6 -

dark brown oxidized till overlying deeply weathered shale and sandstone. It is removed by a wheel excavator that formerly saw service at the Banner Mine. The bedrock (20 to 25 feet thick) is blasted and removed with a stripping shovel. Coal is loaded with a shovel into haulage trucks. The mine has its own cleaning plant.



FORM 180 W

Freeman United Coal Mining Co. Industry Mine

Monday, July 1, 1985

Notes by John Nelson with Ilham Demin and Munir Hussain (visitor from Bangladesh).

Active pit trends east-west and is advancing to south. East end of pit approx. *on east line, Section 25,*
T.4N, R.3W.

A good face of fresh coal is exposed for sampling. The coal contains abundant pyrite, along with calcite and kaolinite, on cleat faces and as thin partings. There are occasional lenses of pyrite also. One small lense of gray silty shale was observed near the top of the seam. No clastic dikes or faults were observed in the active pit.

As observed on previous visits, the coal seam undulates in broad folds or swales; amplitude 10-15 feet. Width several hundred feet.

Channel Sample 1, C23674 taken just behind the loading shovel, this is the freshest coal, exposed this morning. Approx. 2000 feet from east end of pit.

2.02' Coal, bright banded, with no continuous partings. About 50% vitrain and 50% durain and clairain, with occasional very thin discontinuous partings of fusain. One lense of heavily pyritized fusain up to 0.12' thick, about 0.70 feet below top of seam, off to one side of channel cut.

Abundant pyrite or cleat, especially in upper 2/3 of seam, much kaolinite in upper 0.5 feet; a small amount of calcite.



FORM 180 W

-2-

Floor - Claystone, medium gray, soft, with abundant carbonized rootlets.

Location: approx. 2200' from north line, 2400 feet from west line, Section 25, T.4N., R.3W., McDonough County.

Channel Sample 2, C23675.

About 300 feet east of Sample 1.

1.45' Coal, bright banded, about 50% vitrain in bands up to 0.02' thick, 50% clairain and durain; a few discontinuous partings of fusain; blocky fracture, abundant pyrite on cleats, lesser amounts of kaolinite and calcite. One small lens of pyrite with fusain laminae, included in sample.

0.07' Fusain, soft; with small lenses of pyrite. Varies in thickness.

0.62' Coal, similar to top unit, but contains less pyrite.

Floor Claystone, olive gray, soft, with abundant carbonized rootlets.

Total Coal 2.14 feet.

Location: approximately 2200 feet from north line, 2600 feet from east line, Section 25.



FORM 180 W

-3-

Channel Sample 3, C23676

Composite of Samples 1, 2, 3 = C23677

Farthest to east, about 800 feet east of Sample 1.
This coal has been exposed the longest.

0.94' Coal, bright banded, with vitrain bands up to 0.02' thick; about 50% vitrain, 50% durain and clairain; blocky fracture; abundant pyrite on cleat, lesser amounts of calcite and kaolinite.

0.03' Fusain, soft

0.40' Coal, similar to top unit.

0.01' Fusain, soft.

0.45' Coal, similar to top unit.

0.16' Fusain, soft; with pyrite streaks near base.
A broad lens.

0.40' Coal, similar to top unit.

Floor - Claystone, medium gray, soft, full of carbonized rootlets.

Total coal 2.39 feet.

Location: approximately 2200 feet from north line,
2100 feet from east line, Section 25.

There are no good continuous exposures of the overburden. On top is about 15 feet of unconsolidated Quaternary material (till and loess) and weathered



FORM 180 W

-4-

bedrock, which is removed by a bucket-wheel excavator. Below is 30 to 40 feet of bedrock which must be blasted and removed by the stripping shovel. The bedrock consists of medium to light gray silty shale, siltstone, and fine sandstone.

The best exposure of bedrock is along the main incline into the pit but even here the lower 10 feet or so are covered by talus. The lowest rock visible is very uniform medium-light gray, silty, firm mudstone. It is very faintly laminated, finely micaceous and contains no fossils or visible carbonaceous matter. This mudstone is overlain sharply by sandstone, light gray and very fine-grained; coarse mica, plant debris and coal stringers abundant near base, less abundant upward. Beds are 8-18 inches thick in lower part; upward beds thin to 3-4 inches and are very regular. Possible interference ripples at some horizons are the only sedimentary structures. No fossils noted, other than broken plant debris.



FORM 180 W

**Industry Mine of Freeman United Coal Co.
McDonough Co, IL**

Visit by Heinz Damberger, Phil DeMaris and Tom Phillips(UI) on October 9, 1989. Notes by HDD.

Tom Szpyrka, Geologist of Freeman United was our host.

(Canton office)

The following notes are by Damberger; see separate notes on coal balls by DeMaris and Phillips.

Roger Nance had called Damberger last week to report that **coal balls had been found** in the Industry Mine. He sent a sample which was examined by Phillips. DeMaris set up the mine visit with Tom. The main purpose thus was to collect coal balls. Damberger came along to look for clastic dikes in the Colchester Coal which had previously been reported from this mine by Nelson (Mine Notes of 7/83).

General information on mine. Mine started production in 1982. Produces about 500k tons per year. They have about 20 years of reserves left to mine. They started mining west of the road and north of the road to mine mining southward. The pit is about 2.4 mi long (somewhat variable). The seam averages 2'2".

They drilled the property at a 660' spacing; only selected holes were cored to obtain samples of the coal. The 660' spacing was selected to assure them of no significant surprises in terms of elevation, cutouts, etc. They feel they can get coal thickness within 1-2 in. from drill cuttings. They have their own drill rig.

Coal is sold to a fairly new power plant in Muscatine, Iowa, under a long-term contract. The power plant was designed for this type of coal, relatively high heating value, etc., rather than western coal; it is equipped with scrubbers. The coal is trucked to Quincy, IL, loaded on barges for shipment to the power plant up on the Mississippi River.

The cycle between initial disturbance of land and its return to the

P1 - HDD 10/9/89



FORM 180 W

farmers for production takes about six years. The area north of the E W road to has been fully reclaimed. Some woodland was converted into productive farm land in the process. Productivity now is well into the 90% and they expect it to get back to 100% of what it was before mining in a year or two. They developed a innovative technique to handle top soil. They use scrapers to push is together into piles ahead of mining. When they get to removing the overburden they use the bucket wheel excavator to transfer these soil piles back to the spoil area, thus avoiding excessive handling of the top soil. It is then spread out over the spoil with dozers during the reclamation process.

They use the bucket wheel excavator to remove the unconsolidated overburden and some of the soft weathered bedrock. Then they blast the remaining bedrock and move it with a big shovel. They take about 100 - 120' on each strip. It takes them about 2 months to complete mining from one end to the other of the currently 2.4 mi long pit. The wheel and shovel work side by side, more or less.

Along valley bottoms the coal crops out and has been mined for local supply in room and pillar deep mines; there are no maps available for these mines. They run into these old mine workings; coal tends to be weathered around pillars left; recovery of coal is quite low. Mines usually do not extend far from outcrop. When they were planning the mine they tried to take channel samples along the cropline; but they could not find any undisturbed areas and were unable to get channel samples.

Coal ball occurrences. They initially ran into occasional coal balls in the eastern portion of the pit over a year ago. It seems that coal balls occur along a WSW trend, over a width of 200'-400' (see mine map). So far, coal balls have occurred over a length of a good 2,400 ft. However, this information is based on sketchy information. The company does not keep track of coal ball locations on the mine map. We suggested that Tom take note of coal ball occurrences whenever he visits the mine and keep track of their location on a map. Tom gave us a map of the mine (scale of 1"=400') showing the area of highest concentration of coal balls; the map was drawn from memory. A reduced machine copy of the area of coal ball occurrences is included with Phil DeMaris' mine notes of same date.

p.2 44D 10/9/89



FORM 180 W

Geology of mine. Coal seam averages 2'2", according to Tom. They have an isopach map; Tom will send us a copy of that map. Elevation varies; in mine we saw elevation changes of about 10 ft within 100-200 ft in one prominent swale in about eastern 1/3 of pit. Other undulations in seam elevations were mostly of 3-5 ft amplitude within 100-300 feet laterally. However, overall, according to Tom, coal elevation stays quite stable. They produced a structure map and Tom said he will send us a copy. Bedrock thickness varies between about 20 and 55 ft.; bedrock is overlain by about 20 ft. till. Max. overburden within mine property is 70-75 ft; there is only one relatively restricted area with this thickness. On the average the overburden is in the 50-55 ft range over the entire mine property.

The bedrock overburden consisted primarily of gray fine grained sandstone, siltstone, and silty shale, interbedded with bed thicknesses mostly in the fraction of inch to around 1 ft range. Basal 5-6 ft directly above coal were not exposed but it looked like it was pretty much the same material, may be with more shale. It is not clear whether this is a sandy facies of the Francis Creek Shale or the sandstone that was observed by Nelson to overlie the Mecca Quarry Shale.

The till overburden is free of large boulders which would be difficult to handle by bucket wheel excavator. Over small boulders were not obvious; however, we did not look at the till material at any length. It has a yellowish brown color, looks loamy, forms fairly steep slopes similar to loess; does not cause any unusual problems during mining. We did not discuss groundwater, water influx into the pit. At least 5 pumps were stationed at low spots within the pit where they had dug sumps into the underclay. They simply pump water out of pit over highwall.

The underclay seems quite typical (gray claystone with stigmata). We did not see any good exposures (only in small wet sump pits). They use underclay material to build their haulage roads. Roads become slippery when wet (rain), but compact well to form good surface for big trucks to travel on.

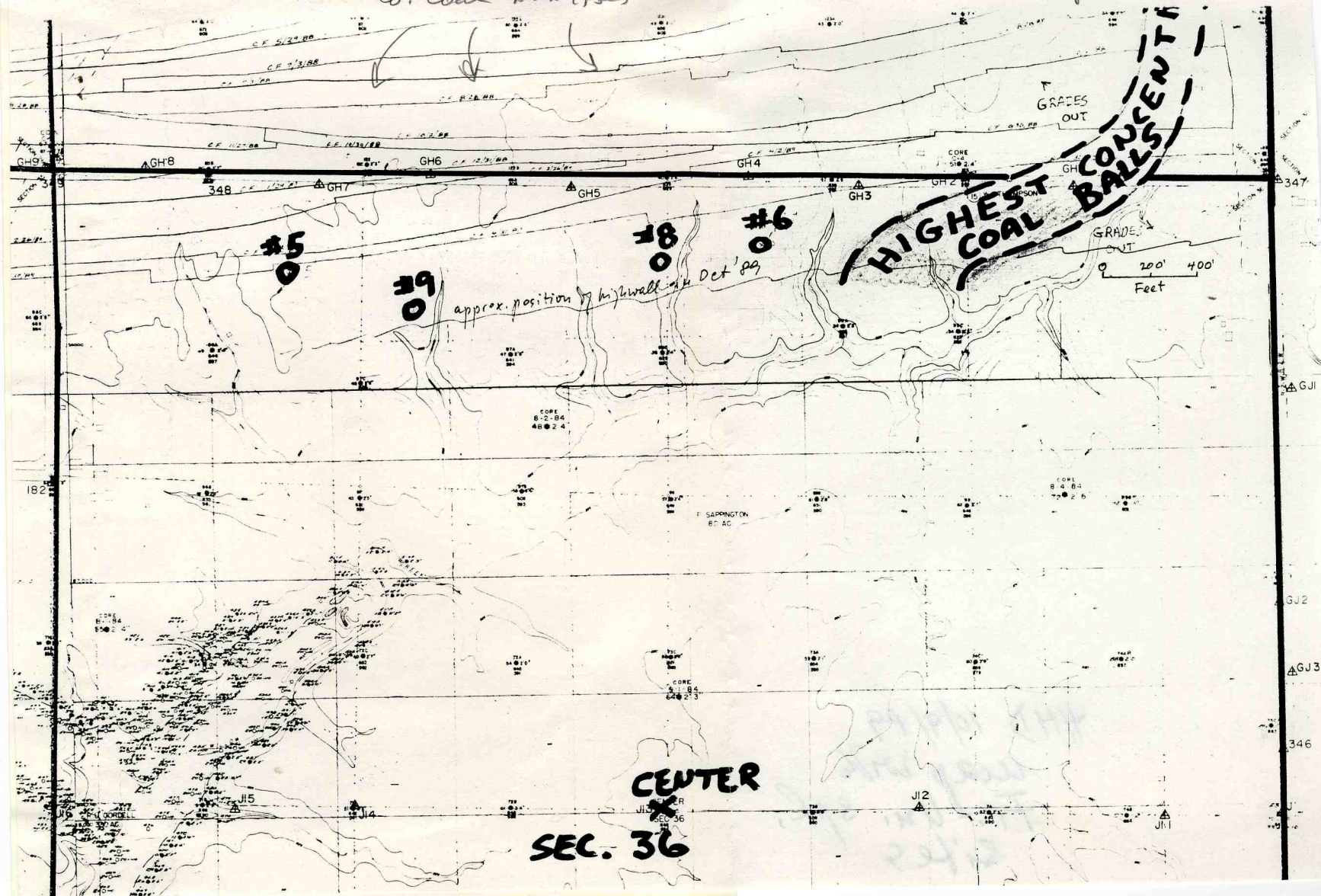
Coal sampling by company. For the past two months they have

p. 3 - HHD 10/9/89

MOORE'S MODERN METHODS
FORM 180 W

Co. Coal Analyses

Freeman Industry Mine (Oct. '89)





FORM 180 W

been taking about 150 pds. channel samples (about 1.5x1.5 to 2x2 ft) once a month, which works out to about 2 samples per strip (Tom showed locations of 4 sample locations on the map he provided to us; a machine copy of the area of sampling is included with these notes; the map itself is kept by the Coal Section, DeMaris or Bargh; Harvey has the results of Freeman-United's chemical analyses on file, also a copy of the map with sample locations). Freeman-United has their own lab where they run prox, sulfur, Btu/lb, and a complete washability. They also submit samples to an outside commercial lab to obtain equilibrium moisture data. This is a new program that they run at all their mines. It was initiated in response to US IRS questions on coal tax/ton (reclamation, black lung) which is based on the "inherent moisture" content of the coal; equil. moisture was agreed to be equivalent to inherent moisture by both company and IRS. During exploration they analyzed many coal cores. However, early analyses were not standardized and represent a diversity of data sets that are difficult to compare. Therefore, they performed another core sampling systematically distributed over the property, designed in such a manner that they have 4 cores for each year of production. These cores were all analyzed the same way. Tom believes that they also obtained equilibrium moisture values on all or most of these core samples. These are the samples they will compare the channel samples they are now taking; they will determine how well cores represent the coal, in comparison to representative channel samples.

Coal Sampling by us for bed and equilibrium moisture determinations (Harvey's request). We took a grab sample of freshly mined coal about 1000 ft from E end of pit. These were 5-6 lumps each a few inches in diameter. The coal seam has been exposed for about a month. When they remove the overburden they leave 1-2 inches of roof shale (hard, grey silty shale to siltstone) on the coal to protect the coal when they travel over it with their 100 ton trucks etc. during mining (prevents loss of coal in mining). Thus the coal was fairly well protected against weather during this month of exposure. The face we sampled from was rather fresh, right behind the coal shovel; sample taken probably only a few hours since coal had been mined there; face within 1-2 ft may have been a few days old, though. Coal looked fresh, felt "bed-moist", should be a reasonably good sample to represent in situ moisture.

P.Y - KHD 10/9/89



FORM 180 W

Character of coal. Thickness of coal is very consistent throughout pit, no indication of erosion, significant variation in thickness, or other deficiencies. Looked hard for clastic dikes but could not find any trace of them (as Nelson did during his visit in July, 1983. No detailed descriptions of coal seam done, but coal bed seems rather "typical" in appearance, with predominance of bright banded coal. Cleats are generally prominent, but no dominant cleat sets are obvious. Many different trends seem represented with no consistence, horizontally or vertically. Cleat surfaces are commonly thinly coated with a white mineral, which seems to be kaolinite in many cases, judging from its softness; but calcite and particularly pyrite are also common as cleat coatings. Fusain lenses are common throughout coal seam, some quite thick (found one 1.5"-2" thick 1'-2' wide lense of soft fusain); fusain is often mineralized (mostly with pyrite). It seems that fusain is more abundant in this seam than in other coals of Illinois. No significant partings were observed.

Coal ball samples. Coal balls we found occurred in top portion of coal seam, max. of about 1 ft thick, 5-6 ft length. Some coal usually is over coal balls, fraction of inch to a couple of inches.

Photos by HHD. Color neg film:

- # 1 -2: strip operation with coal shovel in foreground, bucket wheel excavator in background, big shovel behind, drill rig on bench drilling blasting holes.
- # 3: Large lenticular coal ball near top of coal, Phil DeMaris on right side, Tom Szpyrka on left.
- #4: Close-up of same coal ball, hammer for scale
- #5: Coal shovel loading truck.
- #6-7: Bucket wheel excavator.
- #8: Bedrock overburden, partially slumped down and broken up: gray, thin to med. bedded finegrained sandstone, siltstone, silty shale, broken into slabs and blocks along bedding surfaces with carbonaceous matter and mica.
- #9-13: Close-ups of sediments in bedrock overburden; these are blocks that came down as the highwall collapsed
- #14: Bucket wheel excavator stacking.

P.5 - HHD 10/91 89



FORM 180 W

Mine Notes - Freeman United "Industry", McDonough Co.

Visit: October 9, 1989 by Heinz Damberger,
Phil DeMaris and Tom Phillips (U of I):
our guide was Tom Spzyrka, Company
Geologist

Notes by P. DeMaris

Coverage: Introduction
Visit to pit
Samples: FIN-A-1 to -4

Introduction

Roger Nance sent us some coal-ball-like material from mid-seam of Colchester Coal at Industry early in October. I cut a slab (FIN-A-1) and submitted part to XRD and part to TLP to do a peel. Randy Hughes did both a raw analysis and an acid residue. The material is predominantly calcite with lower levels of organic carbon (very finely bound), apatite, pyrite, kaolinite and quartz. The peel suggested that peat was somewhat degraded before mineralization; some zoning is visible, but no identifiable plants were present.

Visit to pit.

We met the Superintendent, Don Tippey, before entering the pit. Coal ball collection was the goal of the visit and this proved to be no problem. The coal balls were mined with the coal, separated at the breaker and returned to the pit for disposal in piles. We examined several piles of such coal balls. Most were in the 1-2' width range and about 1/2' thick. The largest coal ball seen in situ was over a yard long (see photos with HHD's notes).

P. 1 - PJD 10/9, 89

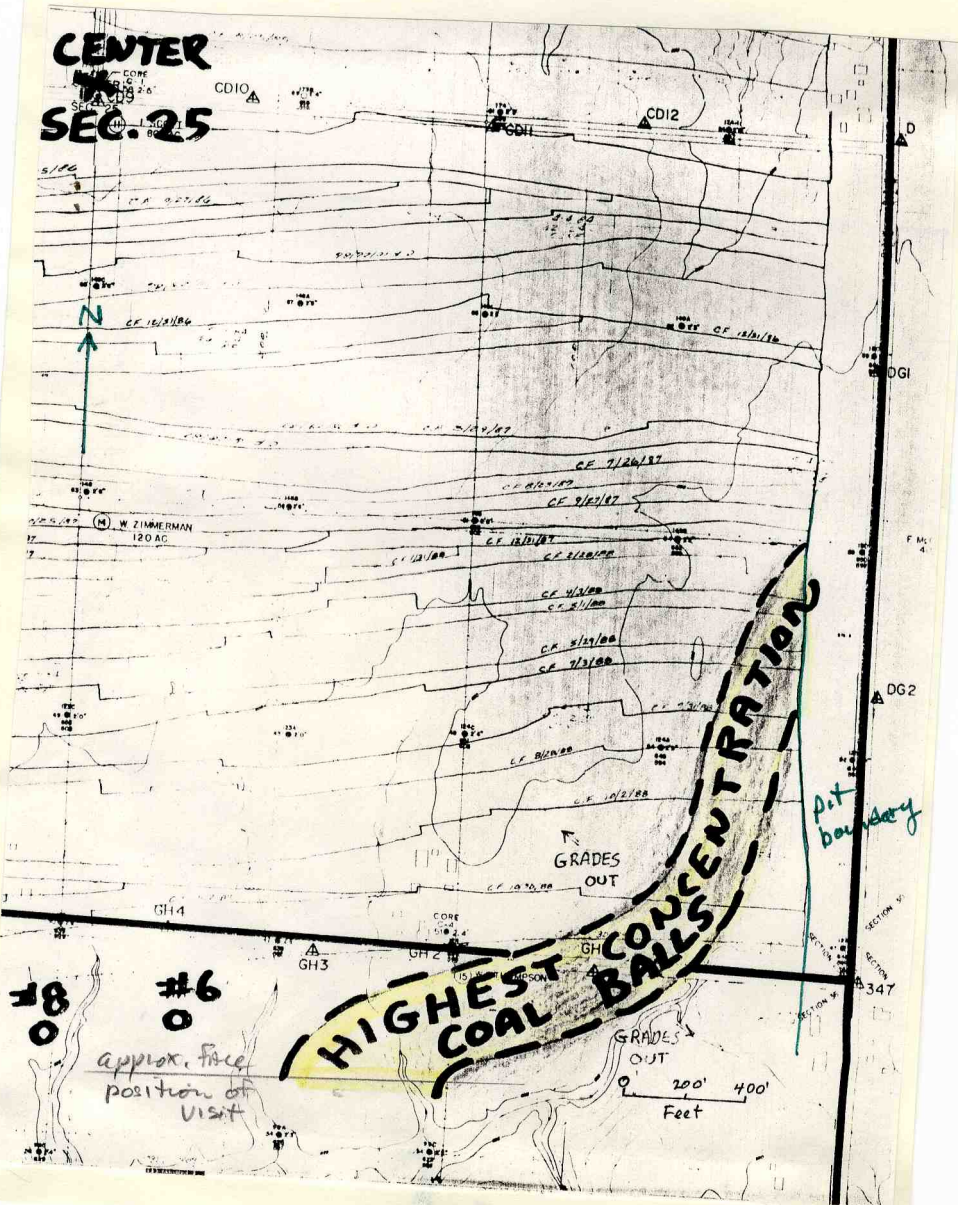


FORM 180 W

10/9/89

C.B. 5 at Industry mine

CENTER
SEC. 25



Tom Phillips and I sorted through many coal balls, avoiding those that were obviously granular in texture with clearly destructive spherical crystalizations. Even those with clear peat pseudo-bedding proved to be botanically unproductive after cutting by TLP. T.L.P. will not retain this material; he noted that some coal balls showed decalcification. Tom Spzyrka later brought us a mine map with the coal balls noted on it; a reduced xerox is attached as map A.

See Damberger's notes which cover all aspects of the mine and its operation, including rough locations along the pit face.

Samples: FIN-A's (to -4)

- A-1 Coal ball from R. Nance (peeled, XRD)
1 slab retained
- A-2 Pyrite (?) in Colchester from mid-seam
pyrite band.
- A-3 A, B, C Sequence of underclay samples:
 - A is 0.4' to 0.6' below coal
 - B is 0.2' to 0.4' below coal and
includes an 0.02' coal band
 - C is 0.0 to 0.2' below coal
- A-4 Coal ball with pelletoidal structure.
RDH wants slice when available. (Chem.?)

mde:IndustryN

p.2- PJD 10/9/89



FORM 180 W

mn-act - medonough-01.41



Industry line, 10/9/89, H. Dambejer
Bucket Wheel excavator, stacking



FORM 180 W



Industroy line, 1991 by H. Dammhoff
Typical fine ss bedrock overb.; note slump of bedding
a. 7/2/93



FORM 180 W



Industry time, 10/9/89, H. Danheiser
 Typical bedrock overburden; fine-gr. ss & siltstone,
 finely laminated (mica on many surfaces)



FORM 180 W



Industry Mine, 10/9/89, H. Harnberger
 Typical bedrock overburden - fine gr. ss &
 siltst., in pt. Flashed dior



FORM 180 W



Industry Mine, 10/9/89, H. Wamke
Typical bedrock overburden: fine-grained ss



FORM 180 W



Industry Mine, 10/9/89 H. Hancher
 Bedrock overburden in spoils, sandstone and
 siltstone. Gray thin-med. bedded fine gr. ss, siltst. var



FORM 180 W

mn-act-medanvsh-02.tlp



Industry line, 10/9/90 H. Dambert
Bucket wheel excavator



FORM 180 W

mn-act - mc doneugh - 03.ttl



Judustry mine, 10/9/89, H. Daucher
Bucket wheel excavator. and



FORM 180 W

mn-act-mendonough-04.td



Industry Mine, 10/9/89, H. Damher vs
Bucket wheel excavator and drill rig.
Phil DeNaris & Tom Phillips walking away



mn. act - medanugh - 05.44

Industry Mine, 10/9/89, H. H. Hamberger
 Coal shovel loading truck. Tom Szpyka (Fr. Un.), Tom
 Phillips (UI) and Phil DeMaris (ISGS).

FORM 180 W



John C. Moore Corporation, Rochester, N.Y. 14604



FORM 180 W



Industry Mine, 10/9/89, H. H. Dambrosius
Close-up of same coal ball at top of coal (Colchester)



FORM 180 W

hm - act - mc donough - oc.tif



Industry Mine, 10/9/89, H.H. Dandridge
Large lenticular coal ball near top of coal, Phil DeMasi's on right
Tom Szpyka of Fr. Un. on left



FORM 180 W

mm-act-mcdonough-07.tip



Industry line, 10/9/89 H.H. Damberger
Strip operation with coal shovel in foreground, bucket
wheel excavator in background, drill rig on bench, drilling blasting
holes



FORM 180 W

1/29/94

Industry Mine

Greg Arnett, 309/647-0855,
called (took over for Tom Spyrka
who got his degree and is now
an intern in a private practice in
Bloomington) to ask if they could
use seismics to locate abd. old
uncharted mine workings they
found in Sec. 33 - 4N-3W.

These are significant diggings,
including a shaft, 800 ft. in, with
air holes (they knew what they were
doing, apparently with approval of
land/mineral owner. Plenty of
coal zone there!
I gave him ph. # of John Sexton, Siv

From "Coal Week" of 12/21/98

A 98-day strike by UMW against Fr. Un.
ended ^{labor} 12/17 when miners ratified a new
4-year agreement. See Crown II Mine for
details.

FREEMAN UNITED COAL MINING COMPANY - INDUSTRY MINE

Notes by John Nelson on a visit with Russ Jacobson, Scott Elrick, & Chris Korose of the ISGS, and Mike Stevenson from Freeman.
Thursday, October 16, 2003

Surface mine in Colchester (No. 2) Coal. This mine is scheduled to close November 5, after more than 20 years of operation.

Bulldozers and scrapers remove topsoil. A bucket-wheel excavator removes glacial drift. Bedrock is blasted, then a stripping shovel removes it to expose the coal seam. A large backhoe loads coal into haulage trucks.

The active pit is at the southwest corner of Freeman's reserve block. The company owns substantial reserves in the wooded area north and northwest of the tippie, but this coal will be held for the future. Freeman holds all coal "in fee", and retains ownership of the land after reclamation, leasing the land to farmers. Industry is the last coal mine operating west of the Illinois River.

Low ash, high BTU, and consistent thickness are advantages of Colchester Coal. Where overburden is 50 feet or less, mining the Colchester is profitable. Sixty to 70 feet of overburden reaches the economic limit. Future mining will entail smaller, isolated tracts mandating use of smaller, mobile equipment rather than big stripping shovels and bucket-wheel excavators. Industry mine has the nation's last operating bucket-wheel excavator.

Observations in Pit

There is no place to examine the highwall first-hand. Based on observations from a distance and fallen blocks, section at north end of the pit is as follows: Location is close to NE corner, **Sec. 4, T.3N., R.4W.**, Schuyler County, Doddsville 7.5' quadrangle. Highwall runs N-S along east line of Section 4 and is 3,000 feet long.

TOP

10-12' Glacial deposits.

8-10' Sandstone, weathers yellowish brown, very fine-grained lithic arenite, medium to thick-bedded. Sharp contact:

40' Siltstone and shale interlaminated, siltstone light gray, shale dark gray and finely carbonaceous; very fine planar lamination with probable tidal rhythmites. Also flaser and ripple-cross lamination. Lower 20 feet concealed.

2-2 ½' Colchester Coal.

2'+ Mudstone, medium to dark gray, silty, slickensided, abundant carbonized root axes.

We didn't take a close look at the coal; it is poorly exposed for study. Pyrite is abundant on cleat faces and as occasional nodules. No clastic partings are evident. Mike Stevenson reports four percent sulfur, 11,500-12,000 BTU, and about 11-14% ash.

Mike told us there was a place in this pit where the coal formed a steep-sided depression. Digging at the bottom of this feature revealed the Wiley Coal, about eight inches thick, only one or two feet below the Colchester.

In the south part of the pit a sump has been dug in the underclay, about three feet exposed. Dark gray claystone at top grades down to greenish-gray siltstone or very fine sandstone, all heavily slickensided and loaded with root traces.

Also an exposure of rock close to the top of the Colchester Coal. It is coarse siltstone to very fine sandstone, medium gray with a greenish cast, abundant carbonaceous laminae

and partings, coal fragments and coalified plant remains, including large stems are common. Planar and ripple lamination, wavy lamination, small load or slump features, and probable tidal rhythmites. Lowest part is massive sandstone containing common small rip-up clasts of coal.

A quick Quaternary description - approximately **2500'NL, 0'EL, Sec. 4, T.3N., R.3W.**

5-6' Peoria silt, mottled and streaked in light gray and orange-brown. Blocky structure, root traces common, small iron-oxide nodules; modern soil. Lower contact irregular and a rapid gradation.

3' Roxana silt, clayey silt to silty clay, medium-dark brownish gray, slight reddish cast on weathered surfaces. Weathered, root traces common. Common granules of quartz, chert, and jasper less than 1 cm, scattered throughout. Sharp wavy contact.

Glasford Formation

10' Sandy diamicton, yellowish orange to yellowish brown, about 10% rounded gravel and small cobbles, wood fragments; lenses of laminated sand and gravel in upper part. Well developed Sangamon soil at top, about three feet thick. Orange with abundant gray root traces.

10' Diamicton, olive gray, weathers bluish gray, Mike calls it "blue clay" - sandy clay to clayey sand with about 5% gravel, mostly pebbles less than 5 cm. Mike reports this fills channels that locally cut out coal.

Top of bedrock.

Abandoned Pit

Location - 100'NL, 1400'WL, Sec. 35, T.4N, R.3W., McDonough County.

Thickness estimated. Quaternary not accessed.

TOP

- 5' Loess, Peoria and Roxana not distinct viewed from pit floor. Top soil may have been "scalped".
- 8' Diamicton, yellowish brown, sandy. Well developed Sangamon soil, with root-traces, at top.
- 25' Sandstone, medium gray with greenish cast, fining upward. Lower part fine-grained, beds one to five feet thick are slightly lenticular. Grades to very fine sandstone in upper part. Thin-bedded with many carbonaceous laminae, interlaminated shale and siltstone. Base concealed.

In the eastern part of the pit, diamicton thickens to about 20 feet, filling a small valley in bedrock. Channel fill is gray and massive, upper Glasford is yellowish orange and appears layered in places (bedded sand and gravel?).



Form 180

8/21/90 Mine visit - Industry Mine, Freeman United
 Located - 1.5 mi W of rt 443, 10.5 mi S. Macomb,
 McDonough County.

Our party: H.Damberger, C-L Chou, ~~P-D-Morris~~, D.Harvey;
 with visitor from USGS, Reston - Elliot Spiker.

Mine guide: Mr. Tom Szpyrka, geologist

The burden is removed by dozers, blasting, and big
 shovels in a normal way. The top soil is managed
 separately, as required by law. Under the soil & till?
 is the Francis Ck Shale, about 20-30 ft. over coal.

We took full channel samples at three sites along the
 $\frac{1}{2}$ mile or so long open cut exposure of the seam.

Site 1. 850' north of the center (SE, NE, SE, NW) sec 36,
 4N-3W, McDonough County. This site was uncovered about
 20 hrs prior to sampling.

Colchester Coal: Sample # IND1, C31315 Sam type - PC.

| | Thckns(ft) |
|--|------------|
| Coal, bright banded; pyr & kaol on cleat, some calcite; banding <0.2, commonly <0.1', typical clarain; the very top surface is a brown clay parting, <0.01'thick. | 0.4 |
| Shale parting, | 0.01 |
| Coal, as above | 0.38 |
| Shale parting, | 0.01 |
| Coal, as above | 0.14 |
| Coal, as above, with pyritic lens | 0.08 |
| Coal, as above, with more cleat minerals | 0.45 |
| Shale parting | - |
| Coal, as above with pyritic lens | 0.42 |
| Coal, as above | 0.33 |
| Total Thickness | 2.22' |

Underclay, base covered (not included in the sample)

By: *RDHarvey* 8/27/90
 County: *McDonough* 36, 4N-3W



Form 180

Industry Mine visit, p.2

Site 2. Approximately 200 ft. west of site 1.

500'W Center line and 730'N of center, sec 36
(sw ne se nw 36, 4N-3W)

Site uncovered about 10 hrs earlier.

Overburden as noted for site 1.

Colchester Coal: Sample # IND2, C31316, sam type - PC.

| | top to base of layer: Feet |
|---|----------------------------|
| Coal, bright banded; mineralized cleat: calcite, kaolinite & pyrite; banding <0.2, commonly <0.1', typical clarain; | 0.70 |
| Coal, dull, boney (?), adjacent to pyr lens | 0.85? |
| Coal, brght bdd | 1.15 |
| Coal, dull, boney(?) | 1.28 |
| Coal, subbrt bdd, finely laminated | 1.75 |
| Fusain parting, soft, shaley coal | 1.85 |
| Coal, subbrght bdd, finely laminated | 2.10 |
| Coal, brght bdd | 2.30 |
| Coal, dull w/fus partings, boney | 2.42 |
| Total Thickness - | 2.42 |

Underclay, base covered

Site 3 - Eastern most part of the pit: 1800'N and 1100'E of center, sec 36 (ne sw ne nw 36, 4N-3W).

Overburden as noted for site 1.

| Sample # IND3, C31317, sam type -PC | Thckns(ft) |
|---|------------|
| Coal, subbrght bdd, finely laminated, calcite & pyrite on cleats, occasional clay ptg; pyrite lens adjacent to channel @ 0.7; | 0.70 |
| Coal, subbrt bdd, somewhat brighter than above, w/ thin pyritic laminations | 0.60 |
| Coal, subbrt bdd | 0.32 |
| Pyrite, fine grained & lenticular | 0.09 |
| Coal, brght bdd, pyrite on cleat | 0.39 |
| Total thickness | 2.10 |

Underclay, base covered



FORM 180 W

8/21/90 Mine visit - Industry Mine, Freeman United
 Located - 1.5 mi W of rt 443, 10.5 mi S. Macomb,
 McDonough County.

Our party: H.Damberger, C-L Chou, D.Harvey;
 with visitor from USGS, Reston - Elliot Spiker.

Mine guide: Mr. Tom Szpyrka, geologist

The burden is removed by dozers, blasting, and big
 shovels in a normal way. The top soil is managed
 separately, as required by law. Under the soil & till?
 is the Francis Ck Shale, about 20-30 ft. over coal.

We took full channel samples at three sites along the
 1/2 mile or so long open cut exposure of the seam.

Site 1. 850' north of the center (SE,NE,SE,NW) sec 36,
 4N-3W, McDonough County. This site was uncovered about
 20 hrs prior to sampling.

Colchester Coal: Sample # IND1, C31315 Sam type - PC.

| | Thckns(ft) |
|--|-------------|
| Coal, bright banded; pyr & kaol on cleat, some calcite; banding <0.2, commonly <0.1', typical clarain; the very top surface is a brown clay parting, <0.01'thick. | 0.4 |
| Shale parting, | 0.01 |
| Coal, as above | 0.38 |
| Shale parting, | 0.01 |
| Coal, as above | 0.14 |
| Coal, as above, with pyritic lens | 0.08 |
| Coal, as above, with more cleat minerals | 0.45 |
| Shale parting | - |
| Coal, as above with pyritic lens | 0.42 |
| Coal, as above | <u>0.33</u> |
| Total Thickness | 2.22' |
| Underclay, base covered (not included in the sample) | |

Industry Mine visit, p.2

Site 2. Approximately 200 ft. west of site 1.

500'W Center line and 730'N of center, sec 36
 (sw ne se nw 36, 4N-3W)

Site uncovered about 10 hrs earlier.

Overburden as noted for site 1.

R O Harvey



FORM 180 W

Colchester Coal: Sample # IND2, C31316, sam type - PC.

| | |
|--|----------------------------|
| | top to base of layer: Feet |
| Coal, bright banded; mineralized cleat: calcite, kaolinite & pyrite; banding <0.2, commonly typical clarain; | <0.1', 0.70 |
| Coal, dull, boney (?), adjacent to pyr lens | 0.85? |
| Coal, bright bdd | 1.15 |
| Coal, dull, boney(?) | 1.28 |
| Coal, subbrt bdd, finely laminated | 1.75 |
| Fusain parting, soft, shaley coal | 1.85 |
| Coal, subbrt bdd, finely laminated | 2.10 |
| Coal, bright bdd | 2.30 |
| Coal, dull w/fus partings, boney | <u>2.42</u> |
| | Total Thickness - 2.42 |

Underclay, base covered

Site 3 - Eastern most part of the pit: 1800'N and 1100'E of center, sec 36 (ne sw ne nw 36, 4N-3W).
Overburden as noted for site 1.

| | |
|---|-------------|
| Sample # IND3, C31317, sam type -PC | Thckns(ft) |
| Coal, subbrt bdd, finely laminated, calcite & pyrite on cleats, occasional clay ptg; pyrite lens adjacent to channel @ 0.7; | 0.70 |
| Coal, subbrt bdd, somewhat brighter than above, w/ thin pyritic laminations | 0.60 |
| Coal, subbrt bdd | 0.32 |
| Pyrite, fine grained & lenticular | 0.09 |
| Coal, bright bdd, pyrite on cleat | <u>0.39</u> |
| Total thickness | 2.10 |

Underclay, base covered

R. J. Farvey
McDonough

8/27/90
36, 4N-3W

8/21/90 Mine visit - Industry Mine, Freeman United
Located - 1.5 mi W of Rt 443, 10.5 mi S. Macomb,
McDonough County.

Our party: H. Damberger, C-L Chou, D. Harvey;
with visitor from USGS, Reston - Elliot Spiker.

Harvey

Notes by

Mine guide: Mr. Tom Szpyrka, geologist

The burden is removed by dozers, blasting, and big
shovels in a normal way. The top soil is managed
separately, as required by law. Under the soil & till? is
the Francis Ck Shale, about 20-30 ft. over coal.

We took full channel samples at three sites along the $\frac{1}{2}$
mile or so long open cut exposure of the seam.

Site 1. 850' north of the center (SE NE SE NW) sec 36,
4N-3W, McDonough County. This site was uncovered about 20
hrs prior to sampling.

Colchester Coal: Sample # IND1, C31315 Sam^{ple} type - PC (partings
too thin to exclude).

Thickness (ft)

| | |
|---|-------|
| Coal, bright banded; pyr & kaol on cleat, some calcite; banding <0.2, commonly <0.1', typical clarain; the very top surface is a brown clay parting, <0.01' thick. | 0.4 |
| Shale parting, | 0.01 |
| Coal, as above | 0.38 |
| Shale parting, (included) | 0.01 |
| Coal, as above | 0.14 |
| Coal, as above, with pyritic lens | 0.08 |
| Coal, as above, with more cleat minerals | 0.45 |
| Shale parting | - |
| Coal, as above with pyritic lens | 0.42 |
| Coal, as above | 0.33 |
| Total Thickness | 2.22' |

Underclay, base covered (not included in the sample)

Industry Mine visit, p. 2

Site 2. Approximately 200 ft. west of site 1.

500'W Center line and 730'N of center, sec 36 (SW NE SE NW 36, 4N-3W)

Site uncovered about 10 hrs earlier.

Overburden as noted for site 1.

Colchester Coal: Sample # IND2, C31316, sam type - PC (*partings for thin to exclude from the sample*)

Top to base of layer: Feet

| | |
|--|-------------|
| Coal, bright banded; mineralized cleat: calcite, kaolinite & pyrite; banding <0.2, commonly typical clarain; | <0.1' |
| Coal, dull, boney (?), adjacent to pyr lens | 0.70 |
| Coal, brght bdd | 0.85? |
| Coal, dull, boney(?) | 1.15 |
| Coal, subbrt bdd, finely laminated | 1.28 |
| Fusain parting, soft, shaley coal | 1.75 |
| Coal, subbrght bdd, finely laminated | 1.85 |
| Coal, brght bdd | 2.10 |
| Coal, dull w/fus partings, boney | 2.30 |
| Total Thickness | <u>2.42</u> |
| | 2.42 |

Underclay, base covered

Site 3 - Eastern most part of the pit: 1800'N and 1100'E of center, sec 36 (NE SW NE NW 36, 4N-3W).

Overburden as noted for site 1.

Sample # IND3, C31317, sam type -PC Thickness (ft)

| | |
|---|-------------|
| Coal, subbrght bdd, finely laminated, calcite & pyrite on cleats, occasional clay ptg; pyrite lens adjacent to channel @ 0.7; | 0.70 |
| Coal, subbrt bdd, somewhat brighter than above, w/thin pyritic laminations | 0.60 |
| Coal, subbrt bdd | 0.32 |
| Pyrite, fine grained & lenticular | 0.09 |
| Coal, brght bdd, pyrite on cleat | <u>0.39</u> |
| Total thickness | 2.10 |

Underclay, base covered



FORM 180 W

SAMPLE HISTORY

Plant sampled: Industry Prep Plant

Date: Oct 27, 1992

Company: Freeman United Coal Mining Co

Sample ID: INDUSTRY

C32774

Company representative: Jim Yancik (West Frankfort office) - Quality Control,
Plant Operations and Maintenance, (618) 932-2164.

Neal H. Merrifield, vp, underground operations

P.O. Box 100, West Frankfort, IL 62896

Mine (source of sample): Industry No. 2 (strip mine)

Collected by: W. Frankie & I. Demir

Seam identification: Colchester No. 2

Time of closure:

Mining period represented (dates):

Panel(s) & location(s) in mine:

Mine locations (descriptive):

1/4 or footage section twp rge

Type of Preparation Plant: Built in 1982 by Roberts and Schaefer, Baum Washing Plant - Plant rated 500 tons raw coal per hour, plant efficiency approximately 70 percent. During visit plant operating at 450 tons raw and 300 tons clean coal per hour. Clean coal product- 55 to 60 percent is represented by a combination of 4" x 1.5" and 1" x .25", and 40 to 45 percent is represented by a combination of 2" x 0" (from crusher), 28 x 100 mesh (from EBW centrifuges with 10-11% moisture), and .25" x 28 mesh (from 8-28" classifying cyclones, 3 to 4% moisture). Plant collects everything over 100 mesh.

Plant operation: Truck dump into rotary breaker - to open stock pile - 4" x 0 into 6 cell jig (2 primary, 4 secondary cells) - output to 8' x 16' double deck sizing screens (top deck 1.5" screen, bottom deck .25" screen) top deck to crusher and then to clean coal belt, bottom deck to goes to VC-48 centrifuges then to clean coal belt. Sizing screen output <.25" x 0 goes to sump, then to 8 - 20" classifying cyclones that separate 80-100 mesh (underflow) and .25" x 28 mesh which goes to sieve screen, oversized product goes to 3 - EB36 centrifuges with product going to clean coal belt. Effluent "underflow" from the 8 classifying cyclones, and 3 EB36 centrifuges goes to polishing circuit consisting of 4 - 15" Crebb Cyclones which dewater and thicken, overflow goes to sieve screen, and underflow <100 mesh goes to pond. Sieve screen underflow goes to pond, overproduct goes to 2 - EBW centrifuges. EBW Centrifuge product goes to clean coal belt and effluent goes to pond.

Sampling point: from loadout bin, coal comes from stock pile

Belt (describe position in plant)

Train

Truck Average 72,000 lbs. we saw one loaded to 79,720 lbs.

Company's sampling device (yes)

Type: Gallagher-Ramsy 2 stage system

increments: Primary sampler- samples every 2.5 min. taking approximately 100 pounds, this goes to a crusher, output 8 mesh, Secondary sampler samples 8 mesh product every 30 sec., output approximately 100 grams. Other (describe) Although the sample is crushed to -8 mesh, it represents 2" x 0 (mostly 2" x 100 mesh) plant output, most of the -100 mesh coal goes to the pond.

Procedures (describe other aspects): They will take sample and send to us the sample will represent 4 days of operation.

Freeman United Coal Mining Company: Industry Mine
10/16/03 - Notes by Christopher Korose, Scott Elrick



Mine to be idled in early November... -2003

met: Mike Stevenson

Surface mine in the Colchester coal
28" coal @ 50' average depth

Dozers remove topsoil

Bucket-wheel excavator (huge) removes unconsolidated overburden (note: this is the last bucketwheel excavator in the country – Scott)

(see next page for picture)



Blasting and large-capacity shovel remove bedrock





Backhoe loads coal into trucks...



10 million tons mined to date, from mine opening 1982.

Company has timber issues with trees on property... now selling to logging companies vs. when they used to let people come in and get the trees... legal issues...

Land is farmed after reclamation, Freeman owns the land outright.

Current highwall cut is 65-70' deep = 33-35:1 stripping ratio!! This is too deep for them...

Mine has 4000-something tons per acre in situ, 3050 tons clean.

Colchester here is:

- low ash
- high Btu
- (high sulfur)

Mike sees 100-acre "pocket" mines are the future of this area, 300k tons/year.

Doghole + small surface mines on property before Freeman took over.

General geology of:

Glacial till
Gray shale (no LS)
Coal

Coal cut-out by BR valleys, and they sometimes delineate the areas of mining.
HIGHWALL 1 SW PIT

Bucket-wheel excavator, 45 cu yd shovel
Francis Creek shale 50-60' thick
Sandy at top
Silty-massive in middle?

10-15' glacial
10 sandy, buff
40 gray shale
2.5 Colchester

Francis Creek: interlaminated silt/sh, thin/thick beds, parallel lams to wavy beds, silt content varies greatly, ripples observed, carbonaceous material throughout, massive to weakly bedded, thick beds.

[Question posed by John Nelson: is this really Francis Creek? The fining-upward sequence observed in inactive pit (your Highwall 3) implies a channel or valley-fill sequence. Conceivably, this is younger than the St. David Limestone and therefore a Canton Shale equivalent. We need to know more about local and regional geology to make the identification, and I haven't done the research. It may indeed be Francis Creek, but we can't automatically assume that gray shale and sandstone above the Colchester is Francis Creek.]

Shovel can only handle 40-42' of rock.

HIGHWALL 2

Unconsolidated:

- Peoria Loess (WI)
- Roxana Till, Sangamon Soil (WI)
- Glasford Fm., diamicton (IL)

little shale seen in this section, we're up a bench from the coal floor.

See John Nelson's measured section.

HIGHWALL 3

Fining upward SS sequence, little shale in this section.

We then left the mine to visit several small “doghole” mines along nearby creek...

John Nelson determined the location and made brief geologic notes on these.



