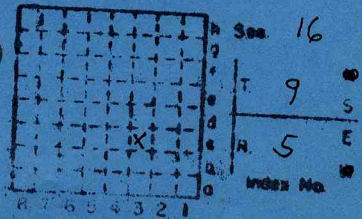


SAHARA COAL COMPANY

MINE NO. 7

ISGS Mine Index No. 802
Coal Report No. S-40
Carrier Mills Quadrangle (7.5')



SALINE COUNTY

(Herrin)

SAHARA COAL COMPANY MINE NO. 7

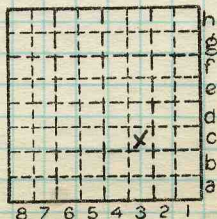
Production Figures	Year	Tonnage
opened October	1982	25,686
	1983	142,378
	1984	210,623
	1985	274,340
closed Sept. 12, '86	1986	221,890
	1987	none

This mine operated from 1944 through 1957, in the Springfield (No. 5) Coal; it was re-opened October 1982 in Herrin (No. 6) Coal.

By _____ Date _____

Quad. Carrier Mills Part _____

County Saline _____



Sec. 16
 T. 9 N. S.
 R. 5 E. W.
 Index No.

Visit to Sahara #7 Mine

Sahara Coal Company

Tuesday, Feb. 5, 1985

Notes by D.K. Lumm

Field partners: W.J. Nelson, S.K. Danner

Purpose of visit is to examine the geologic conditions of the mine. This is our first visit to this mine. where the Herrin (No. 6) Coal was extracted. Sahara originally mined the Springfield (No. 5) Coal using the same slope, prep plant, and surface facilities from August 1944 to December 1959. The slope is located in Sec. 16, T. 9S., R. SE., Saline County.

Basic geologic engineering data:

Herrin (No. 6) Coal is mined, averages 4½'-5' thick over the mine. Immediate roof is Energy Shale or Anna Shale. High angle faults have been reported in the abandoned workings in the No. 5 Coal and may be present in the active mine. A ground subsidence was reported in December 1983 over the Main East, apparently having resulted from subsidence of the workings of the No. 5 Coal. We hope to locate evidence for this in the present workings.

Continuous miners are used at 3 units on 3 man shifts per day. Entries are driven on E-W headings, pillars are not staggered, on 60' or 120' centers. No attempt has been made to super-position the pillars over the pillars of the abandoned workings. Depth to the No. 6 Coal is about 160'. *The interval between the No. 6 and No. 5 Coals is 128'-135'.*

Our guide for the visit is Mr. Todd Parrish, Assistant Superintendent at the No. 7 Mine. We also visited with Mr. Thurman "Pink" Gully, Superintendent.

In Mine Visit.

At the bottom of the slope we began walking westward in the Main West. The coal is overlain by very dark grey Energy Shale. The shale often contains thin laminae of pyrite, calcite, and gypsum.

We hiked about 15-20 cross cuts westward from the slope. Nothing unusual to report. The roof, Energy Shale, is holding up well. The cleat orientation is: face cleat N 40 E. butt cleat: N 40 W. No joints to report in the roof.

A low spot in the floor gave us the opportunity to study the underclay. It is 2.2'-3.2' thick with coal stringers existing in the upper 0.5'. It is non bedded, slightly silty, and breaks into sharp edged clods.

The "blue band" measures 0.1' thick and occurs about 1.6' above the base of the coal.

Structures noted in Main E

About 400' E of the "Y" slope entry we observed a normal fault having 3.2' of displacement down to the E. The fault strikes N 15 W and dips 54E. It is seen here in the S rib of the E-W trackway entry. Reverse or false drag noted.

In the 1st crosscut E of the fault the same normal fault can be observed on both ribs of the N-S crosscut. The strike is N 15 W; the dip, as seen on the W rib, is 77 E. See sketch on following page. The displacement is approximately equal to the thickness of the coal - 5.3'. There is a horizontal component of strike slip movement which is intriguing. In addition, there is a irregularly shaped wedge of heavily fractured coal on the hanging wall above the position of the non disrupted coal seam. This stratigraphic oddity implies that its existance cannot be explained by one episode of movement. To properly account for its position, there must have first been reverse movement and then normal faulting, the coal wedge being sheared off of the seam during the last normal faulting and remaining as a structural remnant of that normal faulting.

We looked at one more location where the fault was exposed - the E-W belt entry N of the track way. The S rib shows a narrow fracture with no offset. The N rib shows us nearly horizontal slickensides with some coal pushed above stratigraphic position on the foot-wall.

See Nelson's notes.

End Visit

Summary of Visit

Roof conditions are generally very good throughout the mine. The Energy Shale, where well jointed, provided an avenue for water percolation. One fault in the East Main has overall normal displacement down to the E. Slickensides and displaced wedges indicate two episodes of movement.

Sahara Coal Company - Mine No. 7
Saline County - February 5, 1985

Notes by John Nelson on visit with Steve Danner and D. K. Lumm. Met superintendent Thurmon "Pink" Gulley and were accompanied underground by Todd Parrish, safety manager.

Mine has slope to Herrin (No. 6) Coal. This is old slope to workings in No. 5 Coal which operated 1942-1957, or thereabouts. Presently working three units. See sketch map. Production goes by conveyor belt to the prep plant at Mine No. 6. All three units have continuous mining machines. Coal underground mover by belt, men and materials by rail (with trolley cable).

The coal seam is $4\frac{1}{2}$ to 5 feet thick in most of the mine. Locally over 6 feet thick. The slope is approximately 160 feet deep, the No. 5 Coal was 128 to 135 feet deeper.

Energy Shale forms immediate roof in places, and ranges up to at least 5 feet thick. The lower part of the shale is medium gray, weathering brown and light yellow; it is poorly laminated, finely silty and contains tiny gypsum crystals. It interfingers laterally with the top layers of coal although no large "rolls" were noted. Upward the shale grades to dark gray, almost black, and is finely laminated and brittle. Sideritic laminae are common. Occasional plant stems in the dark shale; lycopod bark impression noted. Energy Shale lacks systematic jointing.

The Energy Shale appears, at least in some places, to grade upward into the black, fissile, brittle Anna Shale. Elsewhere the contact is sharp and erosional, especially when Energy Shale is thin. Where the Energy Shale is absent, Anna Shale lies directly on the coal, and is overlain in turn by limestone.

Along the Main West the coal has no noticeable dip and undulates very slightly.

The "blue band", if present, is less than an inch thick in most places and locally absent; but in some places several thin shale bands are seen in the lower 2 feet of the seam. Commonly one about 0.5-0.6 feet above the floor, and another 1.5-1.6 feet (blue band ?) above floor. In places, a thin very hard dark gray or black shale band is seen about 1 foot below the top of the coal. This may be the "sulphur band" which is persistent in mines east of here.

A north-trending thrust fault, which I observed in Mine No. 21, projects into Mine No. 7 near Crosscut 28 in the Main West. Although we looked closely, we did not see any sign of thrusting. The roof in this area is Energy Shale, which has fallen out badly and is dripping water in a few spots; however, the only faults observed are low-angle normal slips having at most a few inches of offset and probably caused by differential compaction. Also seen are occasional steeply dipping or vertical fractures with no displacement and not very consistent spacing or orientation. This same area coincides with a place where surface subsidence due to mining of No. 5 Coal was reported. That subsidence has not produced any obvious effects on the Herrin Coal.

In undercasts and sumps we are able to see at least 3 feet of the floor - dark gray, crumbly and heavily slickensided underclay. It is carbonaceous and contains occasional coal stringers, but no recognizable Stigmaria or other fossils.

A few hundred feet east of the slope bottom on the Main East is a fault trending N 15° W/65° NE, having normal displacement about 1.5 feet down to the northeast.

Very little drag, and a very thin zone of gouge. About 40 feet to the east a second fault trending N 15° ~~W~~^E/ 60° NE, with 3.3 feet of normal throw down to the NE. Peculiar structure on the north rib, however, indicates either strike-slip displacement or a component of reverse movement. See sketch.

South of the track in Crosscut 11 is a much cleaner view of the same fault. There it trends N 15° W/ 77° NE and the NE side is down about 5.3 feet, bringing the floor of the coal on the footwall opposite the roof on the hanging wall. Again an indication of strike-slip and/or two periods of movement; a narrow shoot of gray clay (underclay) projects upward in the fault zone above its level on either side of the fault.

The fault splits upward, with a wedge of Brereton Limestone between the branches. The limestone is heavily fractured and laced with calcite veins, some over an inch wide. Faint slickensides are seen; some are nearly vertical but others are oblique to nearly horizontal.

Similar to features seen in Sahara No. 20 and other mines.

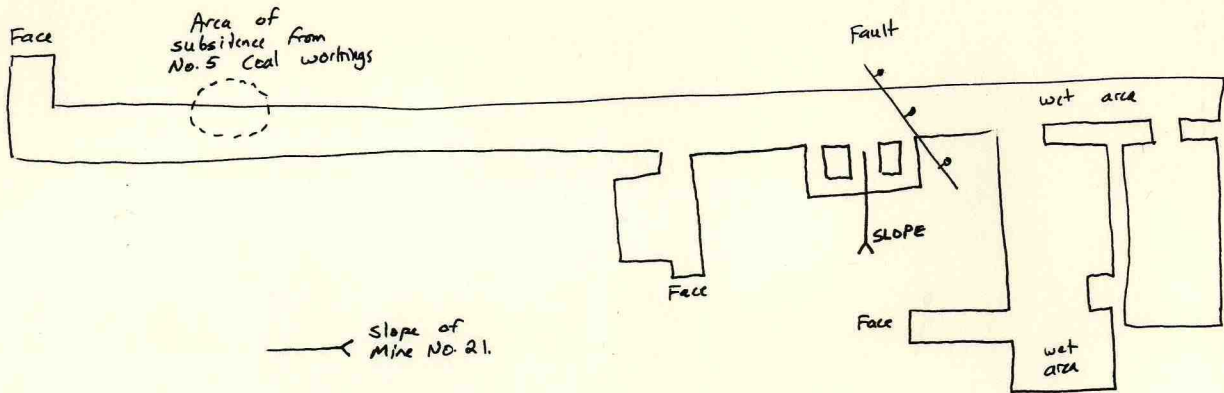
On the belt entry the same fault has practically no net offset, but again slices of coal are upthrown, and slices of limestone downthrown, within the fault zone. Drag and displacement on the westernmost, low-angle branch of the fault clearly indicate reverse movement. See this sketch. Slickensides plunge about 45° SE.

Interpretation of fault

This fault is one of the subsidiary fractures branching southeastward off the Cottage Grove Fault. I believe that the fault developed as a normal fault under NE-SW tension, produced by right-lateral wrenching stress on the Cottage Grove master fault. Continued slippage on the latter may have produced a bulging or upthrusting of the strata on the downthrown side of the subsidiary fault, reversing the earlier movement. This later movement probably was vertical or oblique uplift rather than horizontal compression.

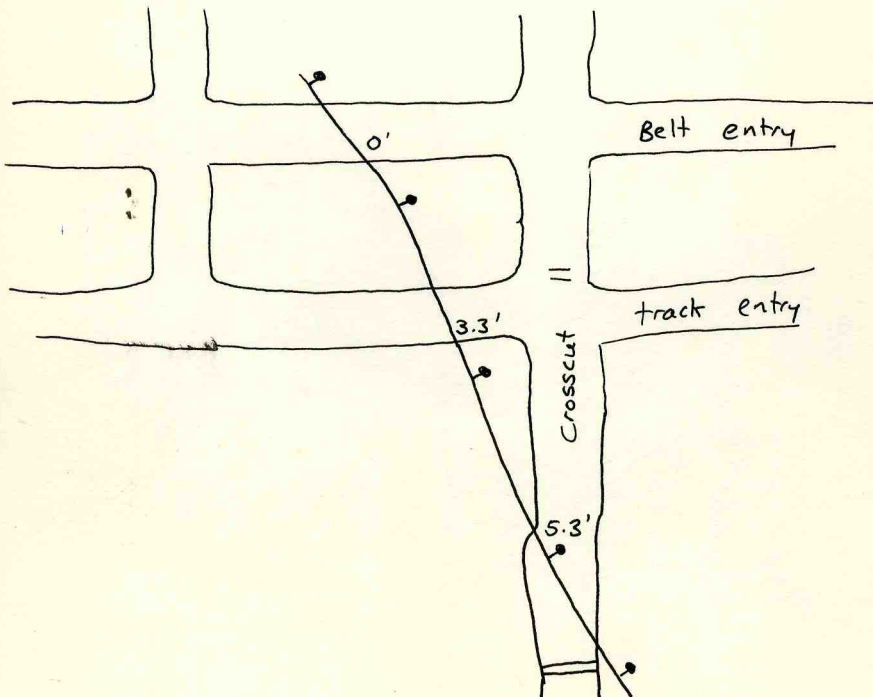
The fault may be a "scissors" fault - we did not look north of the belt entry, but if we did we might find the SW side of the fault upthrown.

Some horizontal (strike-slip) movement may have occurred, but the amount and direction are unknown.



← Slope of Mine No. 21.

Sahara C.C., Mine No. 7
Sketch map of workings
in Herrin (No. 6) Coal

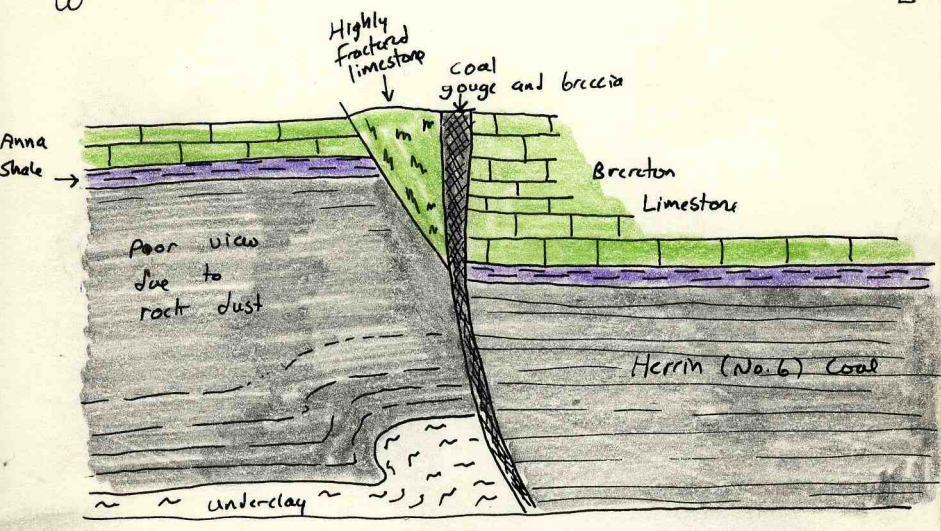




Sketch of fault on north rib of track entry

W

E

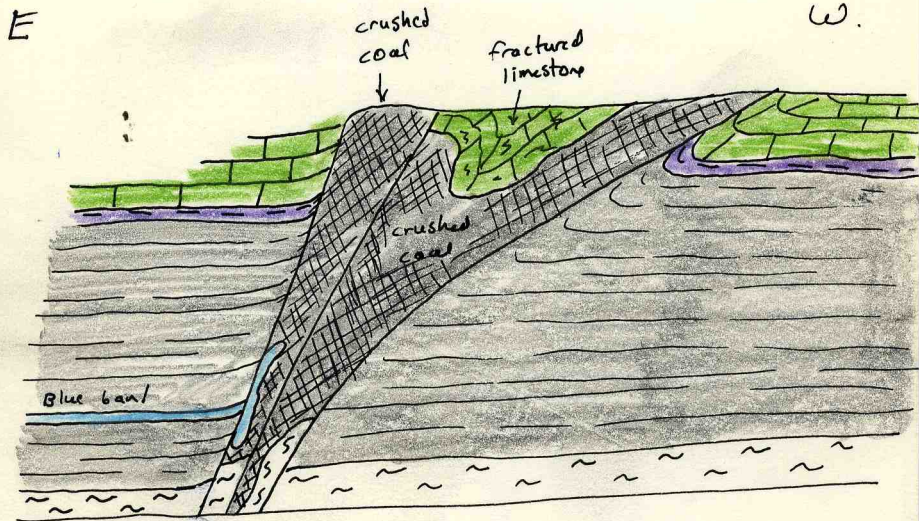


The main offset is a normal fault, but note the reverse flexure in the floor on the footwall, and the coal gouge along the fault above the position of the Herrin coal on either side of the fault.



FORM 180 W

Sketch of same fault on south rib
of belt entry, about 60 ft. north
of track entry.



Almost no net displacement across fault,
but fault slices show both normal and
reverse offset.

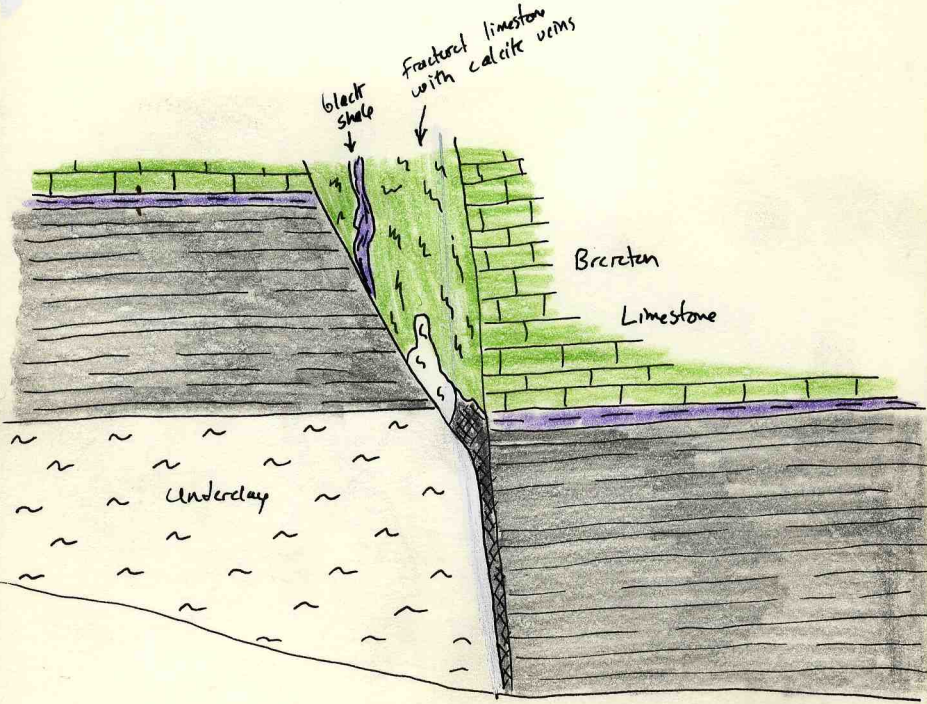


FORM 180 W

Sketch of same fault in Crosscut 11,
about 100 feet southeast of tract entry.

WSW

ENE



At first glance a simple normal fault,
branching upward; but note underclay
squeezed upward along fault plane.

Sahara Coal Company
No. 7 Mine

February 5, 1985
Saline County

Notes by S. K. Danner. Accompanied by John Nelson and Don Lumm (I.S.G.S.), and Todd Parish (company safety man).

Mine No. 7 was active in the Springfield (No. 5) Coal from 1944 to October 1957. In 1982 the old slope was reopened to the Herrin (No. 6) Coal. Production began in the No. 6 Coal in October of 1982, 25 years after the mine was abandoned. The coal is belted across country to the prep plant for Mines No. 6 and 21. Thurman "Pink" Gulley, the mine superintendent, says there is a 128-135 foot interval between the No. 5 and No. 6 Coals. With that much interval, there has been no attempt to super-impose the pillars in the No. 6 Seam over those in the No. 5.

In-mine Observations

At the bottom of the slope we head west along the track entry of the Main West. Todd says the coal averages about 5 feet thick across the mine. He also reports that they have tried to hold the width of the entries to 14 feet along the East and West Mains. Also, some of the pillars are 2 and 3 times longer than usual (120' to 200+' long). Such extraordinary ground control measures are being taken because the Mains will have to be maintained for the life of the mine.

XC #6 and track entry.

This cross-cut shows about 3 feet of Energy Shale grading upwards from a medium gray to a dark gray shale. The dark shale reveals one good impression of Lepidodendron outer bark.

XC #6 and track entry (continued)

The coal is normally bright banded with a well-developed cleat. There is a moderate amount of calcite, and a little kaolinite on the cleat faces.

Face cleat - N 42° E; butt cleat - N 65° W

XC #7 and track entry.

At this intersection, the Energy Shale varies from 2 inches thick and evenly bedded to one foot thick and unevenly bedded. There are some small concretions about 1 inch in diameter and a few scattered shell fragments. There is some jointing in evidence.

Major set: N50°W with 6 inch spacings

Minor set: N50-55°E with 2 foot spacings

XC #9 and track entry.

Jointing in black Anna Shale:
N35°E and N45°W

XC #10 and track entry.

About 3 feet of underclay exposed in rib. Underclay is a medium dark gray, moderately soft; dry; friable; silty, slickensides; contains coal stringers in up 6 inches; has a sharp contact with the coal. It is soft and plastic when wet. Todd reports that it is usually 3 to 4 feet thick with about 4 feet of limestone below.

XC #15 and track entry.

Jointing in Anna Shale: N40°E and N65°W

XC #29 and track entry

Thin, high angle fracture trending N30°E across track entry. There has been water and mud for the last 5 XC's. They have installed a few truss bolts locally as a precaution, although the roof looks fairly competent.

XC #34 and track entry.

In December, 1983, there was a subsidence over Mine No. 21 that propagated all the way to the surface. In June, 1984, the West Mains at Mine No. 7 passed through the subsidence zone formed by the subjacent caving. As we stand here now, it is hard to believe that this area has subsided. The roof appears competent and stable. There are no fractures in the roof, coal, or floor. Except for occasional wet areas between here and XC #27, there has been nothing particularly unusual to note. It appears that the roof, coal, and floor all subsided as a unit, with little or no breakage. It is virtually impossible to determine the limits of the subsidence at the level of the No. 6 Coal.

The miners have dug a sump in this cross-cut and drilled a hole down to the mine in the No. 5 seam. They are currently draining the sump into the old workings of Mine No. 21. The underclay is 3+' thick in the sump.

East Mains, about 600' east of slope, on haulage way.

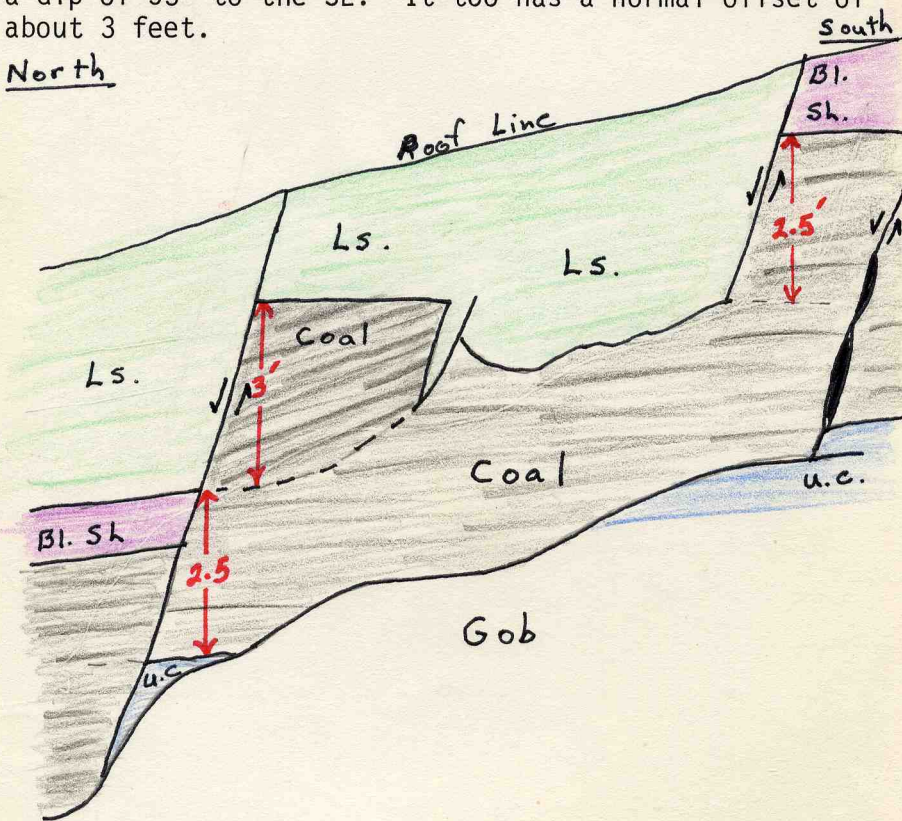
There is a small normal fault crossing the entry at this location. The fault trends about N15°W, with a dip of about 54° to the NE. There is about a foot of offset at the top of the coal with the NE block downdropped. Very little drag or gouge, basically a clean fault.

There is another fault about 30 feet further east of this entry. It too strikes about N15°W, with a dip of about 55° to the NE. It is downdropped about 3.25' to the NE. The south rib of the entry shows no drag. The gouge zone is between 0.7 and 1.5 feet thick and composed primarily of brecciated coal.

XC #11 and Main East Track Entry.

The second fault we encountered on the track entry is much more dramatic in XC #11, about 100' south of the track entry. See Nelson's notes for a sketch of the fault in the west rib of XC #11. The following sketch is of the fault zone where it passes through the east rib of XC #11.

The northernmost fault trends $N15^{\circ}W$, with a dip of 77° to the NE. The NE block is downthrown about 3 feet. The southernmost fault trends about $N40^{\circ}W$, with a dip of 53° to the SE. It too has a normal offset of about 3 feet.





FORM 180 W

Sahara Coal Co.
No. 7 Mine, Saline Co.
Slope mine - Herrin (No. 6) Coal
Notes by D. K. Lumm
Field partner: S. K. Danner
July 22, 1986

Purpose of visit is to collect channel samples of the Herrin (No. 6) Coal for Project USGS 86. Coal lithotypes will be described in addition to general mine notes.

We met on top with Thurman "Pink" Gully, Mine Superintendent. Gary McBride, chief electrician, accompanied us underground.

Mine is currently operating 3 units at 3 shifts/day. The No. 7 Mine reopened in October 1982 in the Herrin (No. 6) Coal and is developing to the west and to the east. Continuous miners are used, coal is belted by slope to be crushed and washed at prep plant used for the mining of the Springfield Coal between 1944-1959. The current operation has an expected life of 15 more years.

Immediate roof is predominately black fissile shale with minor occurrences of Brereton Limestone averaging 4' but varying from 0'-8' throughout the mine, and channel phase sandstone which causes local water infiltration. General condition of roof is good; 4' and 8' bolts are used.

Floor is claystone with many local sags and wet spots due to water seepage from sandstone. Rail transportation is very difficult in some areas.

Of interest is the antiquated mine trolleys and man trips used by Sahara. Gary said that Sahara is very cost conscious in matters of equipment. One mine trolley we saw was a 1918 vintage and relied on for regular use.



FORM 180 W

Sahara Coal Co.

-2-

No. 7 Mine

Channel Sample No. 1Lab No. C25225

Mine location: Unit 2, belt entry, survey spad #27
 Legal description: 1380' from NL, 900' from WL., Sec.
 17, T.9S., R.5E., Saline County

Seam description, from top to base:

- 1.5' Roof shale: (Anna); very dark gray to black, laminated, with carbonaceous plant debris, some Calamites, sp.; base of unit contains coal laminae. Sharp contact with:
- 1.30' Coal: Herrin (No. 6); normally bright banded (NBB), black, 80%+ clarain, 10% vitrain, very little fusain, occasional discontinuous pyrite laminae. Small cleat is moderately well developed, with some pyrite on cleat face and very little calcite cleat.
- 0.05' Fusain: Specular, indurated, variable thickness, discontinuous, contains a pyrite nodule.
- 0.70' Coal: NBB, similar to above, slight increase in calcite on cleat; predominately clarain.
- 0.04' Fusain: indurated, variable thickness, discontinuous.
- 0.45' Coal: NBB, similar to above, contains 3 thin discontinuous bands of fusain.
- 0.01' Pyrite: hard, discontinuous.
- 0.28' Coal: NBB, similar to above
- 0.02' Pyrite: variable thickness, discontinuous.



FORM 180 W

Sahara Coal Co.

-3-

No. 7 Mine

- 0.60' Coal: NBB, mostly clarain, very little vitrain or fusain.
- 0.11' Shale: pyritized, medium gray, hard, appears continuous, variable thickness (0.05'-0.11') sharp contact with
- 0.37' Coal: NBB, similar to above, poorly developed cleat.
- 0.05' Coal: dull, like durain
- 0.17' Coal, NBB, mostly clarain
- 0.06' Shale, medium dark gray, finely laminated, appears continuous, medium hardness
- 0.21' Coal: NBB, mostly clarain, some kaolinite on cleat faces
- 0.05' Shale: medium dark gray, medium hardness, contains laminae of coal
- 0.13' Coal, similar to above
- 0.10' Shale, pyritized, medium gray, hard, finely laminated, contorted bedding, discontinuous.
- 0.48' Coal, NBB, some clcite on cleat faces, 90%+ clarain, sharp contact with floor.

Floor: claystone: medium dark gray, silty, firm, small slickensides, non carbonaceous, relatively clean.

END SECTION Total coal thickness = 5.18'



FORM 180 W

Sahara Coal Co.

-4-

No. 7 Mine

Sample Site #2C25226

Mine location: Unit 3, #1 entry, survey spad #20

Legal description: 2045' from SL, 795' from WL, Sec. 16, T.9S., R.5E., Saline Co.

Seam description from top to base:

Roof shale: (Anna) dark gray, finely laminated, slightly fissile and silty, sharp contact with:

0.53' Coal: Herrin (No. 6): NBB, black, 80-90% clarain, 10% vitrain, no visible fusain, calcite and kaolinite on cleat, moderate cleat development

0.005- pyrite: discontinuous

0.07' Coal: NBB, similar to above

0.005' Pyrite:

0.44' Coal: NBB, similar to above, 90% clarain, 10% vitrain

0.01'-Pyrite: grades laterally to pyritized shale, 0.02' up to 0.02' thick

1.18' Coal: NBB, calcite and kaolinite cleat facings. Some small vertical fractures 80%-90% clarain.

0.015'Pyrite: discontinuous, variable thickness

0.49' Coal: NBB, similar to above, vertical calcite filled fractures.



FORM 180 W

Sahara Coal Co.

-5-

No. 7 Mine

0.015' Shale: discontinuous, silty, dark gray, locally pyritized.

0.52' Coal: NBB, little or no calcite and kaolinite

0.02' Pyrite: discontinuous

0.21' Coal: NBB, 90%+ clarain

0.05' Fusain

0.10' Coal: NBB

0.01' Pyrite:

0.11' Coal: NBB, 95% clarain

0.05' Shale: dark gray, silty

0.62' Coal: NBB, 80%-90% clarain

0.065' Shale:

0.23' Coal: NBB, 60% clarain, 40% vitrain

Floor: claystone: medium gray, few slickensides, very little carbonaceous debris, silty.

END SECTION. Total coal thickness = 4.77'



Form 180 Blue

Location sheet filed under
Bankston Ck. Coll.

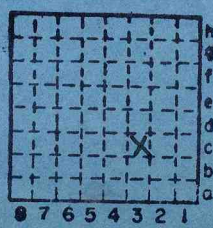
Sahara C.C., 7

Mine Index 802

COUNTY NO. 1342

S-40

✓ (Springfield coal)



h	Sec. 14
g	
f	
e	T 9 N
d	
c	R 5 E
b	
a	

INDEX No. X

8 7 6 5 4 3 2 1



Mine originally operated by: (1)

Date

Bantston Creek Collieries

No 7

Aug. 1944

Original name or number:

Illinois Coal Report 1944 p.

LATER OPERATORS

Date

Operator

Name or No.

2 51 SAHARA COAL CO. #7

3 1956 " "

reopened Dec., 1956

4 1959 Abandoned Dec. 1959

6 1983 Sahara Coal Company #7

reopened in the Herrin (No. 6)

using same slope entry and surface facilities DKL 2/8/85

6'7" - Coal - G.S.A. ref.

14 250' N 350' W of SE corner NW SE (1948) 1946 OK

*Also owners

#See ownership sheet

Railroad, Wagon, Strip, Idle, Abandoned Slope

IDENTIFICATION

County No.

1342

Coal No.

5

Coal Report No.

S-40

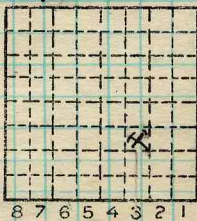
Quad.

Galatia Hamburg

County

Saline

(1948) 6'3"



Sec. 16

T. 9 S

R. 5 E

Index No.

COAL MINE OPERATOR



(Sheets) COAL PRODUCTION (Sheet)

Period						Tons			
Mo.	Day	Year	Mo.	Day	Year				
Aug		1944	12	31	1944	20	619		
					1945	135	677		
					1946	243	919		
					1947	289	698		
					1948	248	645		
					1949	263	765		
					50	250	329		
					51	276	610		
					52	257	111		
						299	992		
					1954	49	277		
					1955	IDLE			
					1956	5	557		
					1957	56	186		
					1958	Idle			
					1959	461	Dec.		

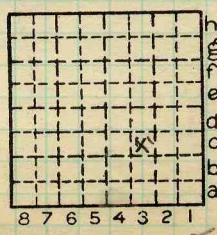
idle Oct, 57

SUMMARIES

No.	to	No.				

Railroad, Wagon, Idle, Abandoned Slope
 IDENTIFICATION *March, 1954*

County No. 1342 Coal No. 5
 S-40
 Quad. Galatia Part Harruba r9
 County Saline



Sec. 16
 T. 9 S. 8
 R. 5 E. W.
 Index No.

COAL MINE—PRODUCTION

0916 C3



LOCATION AND ELEVATION

Location: 7 side R. R.
 side R. R.
 side Highway No.

on top. map Location sheet

Elevation: Method; 1. Est. () _____ ft.
 2. Inst. (kind _____) _____ ft.
 By _____ Data sheet

DEPTH

Authority _____ To coal _____ ft.
 Authority _____ Rail to rail _____ ft.
 Top of coal above rail. (Est. Rule) _____ ft.
 To coal _____ ft.

ALTITUDE OF TOP OF COAL

By estimated data _____
 By instrumental data _____ ft.

Thickness

Max. _____ in. Min. _____ in. Aver. _____ in.

GEOLOGICAL DATA

Mine notes, date _____
 Coop No. _____ Pyr. inv. _____ Coal Ash inv. _____

CHEMICAL DATA

Analyses Face	U. I.	B. M.	Others
Car	U. I.	B. M.	Others
Org. Sulf	U. I.	B. M.	Others
Ash fusion	U. I.	B. M.	Others
Ash anal.	U. I.	B. M.	Others
	U. I.	B. M.	Others

Classification

Misc. tests: Coking. _____ Cleaning _____ Boiler _____

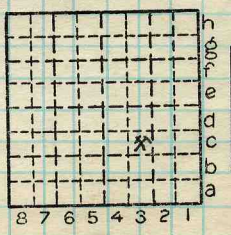
Published descriptions:—

Railroad, Wagon, Idle, Abandoned Slope

IDENTIFICATION

County No. 1342
S-40
 Quad. Harrisburg
 County Saline

Coal No. 5
 Part



Sec. 7b
 T. 9 N.
 R. 5 S.
 Index No. _____ W.

0916 C3

COAL MINE LOCATION AND DATA

Sahara Coal Company
No. 7 Mine

2/5/85
Saline County

Notes by S. K. Danner. Accompanied
by John Nelson and Don Lumm (I. S. G. S.),
and Todd Parish (company safety man).

Mine No. 7 was active in the Springfield
(No. 5) Coal from 1944 to Oct. 1957. In
1982 the old slope was reopened to the
Herrin (No. 6) Coal. Production began in the
No. 6 Coal in October of 1982, 25 years
after the mine was abandoned. The
coal is belted across country to the
prep plant for Mines No. 6 and 21.
Thurman "Pink" Gulley, the mine superintend-
ent says there is a 128 - 135 ft interval
between the No. 5 and No. 6 Coals. With
that much interval, there has been no
attempt to super-impose the pillars
in the No. 6 Seam over those in the No. 5.

In-mine Observations

At the bottom of the slope we head
west along the track entry of the Main West.
Todd says the coal averages about 5 ft.
thick across the mine. He also reports that
they have tried to hold the width of the entries
to 14 ft along the East and West Mains.
Also, some of the pillars are 2 and 3
times longer than usual (120' to 200+' long).
Such extraordinary ground control measures

are being taken because the Mains will have to be maintained for the life of the mine.

← XC # 6 and track entry.

This cross-cut shows about 3 ft. of Energy shale grading upwards from a med. gray to a dark gray shale. The dark shale reveals one good impression of *Lepidodendron* outer bark.

The coal is No. 13, with a well-developed cleat. There is a moderate amount of calcite, and a little kaolinite on the cleat faces.

Face cleat - N42°E; butt cleat - N65°W

XC # 7 and track entry

At this intersection the Energy Shale varies from 2 inches thick and evenly bedded to one foot thick & unevenly bedded. There are some small concretions about 1 inch in diameter and a few scattered shell fragments. There is some jointing in evidence.

major set: N50°W w/ 6 inch spacings.

minor set: N50-55°E w/ 2 ft. spacings.

XC # 9 and track entry.

Jointing in black Anna Shale:

N35°E and N45°W

XC # 10 and track entry.

About 3 ft. of underclay exposed in rib. Underclay is a med. dark gray,

moderately soft; dry; friable; silty, slicken-sided; contains coal stringers in up 6 inches; has a sharp contact with the coal. It is soft and plastic when wet. Todd reports that it is usually 3 to 4 feet thick with about 4 ft of limestone below.

XC#15 and track entry.

Jointing in Anna Shale: $N40^{\circ}E$ and $N65^{\circ}W$.

XC#29 and track entry.

Thin, high angle fracture trending $N30^{\circ}E$ across track entry. There has been water and mud for the last 5 XC's. They have installed a few truss bolts locally as a precaution, although the roof looks fairly competent.

XC# 34 and track entry.

In December, 1983, there was a subsidence over mine No. 21 that propagated all the way to the surface. In June, 1984, the West Mains of Mine No. 7 passed through the subsidence zone formed by the subjacent caving. As we stand here now, it is hard to believe that this area has subsided. The roof appears competent and stable. There are no fractures in the roof, coal, or floor. Except for occasional wet areas between here and XC# 27, there has been nothing particularly unusual to note. It appears that the roof, coal, and

floor all subsided as a unit, with little or no breakage. It is virtually impossible to determine the limits of the subsidence at the level of the No. 6 Coal.

The miners have dug a sump in this cross-cut and drilled a hole down to the mine in the No. 5 seam. They are currently draining the sump into the old workings of mine No. 21. The underclay is about 3' thick in the sump.

East mains, about 600' east of slope, on haulageway.

There is a small normal fault crossing the entry at this location. The fault trends about $N 15^{\circ} W$, with a dip of about 54° to the NE. There is about a foot of offset at the top of the coal with the NE block downdropped. Very little drag or gouge, basically a clean fault.

There is another fault about 30' feet further east on this entry. It too strikes about $N 15^{\circ} W$, with a dip of about 55° to the NE. It is downdropped about 3.25' to the NE. The south rib of the entry shows no drag. The gouge zone is between 0.7 and 1.5 feet thick and composed primarily of brecciated coal.

XC# 11 and main East Track Entry.

The second fault we encountered on the track entry is much more dramatic in XC# 11, about 100' south of the track entry. See Nelson's notes for a sketch of the fault in the west rib of XC# 11. The following sketch is of the fault zone where it passes through the east rib of XC# 11.

The northernmost fault trends $N 15^{\circ} W$, with a dip of 77° to the NE. The NE block is downthrown about 3 feet. The southernmost fault trends about $N 40^{\circ} W$, with a dip of 53° to the SE. It too has a normal offset of about 3 feet,

