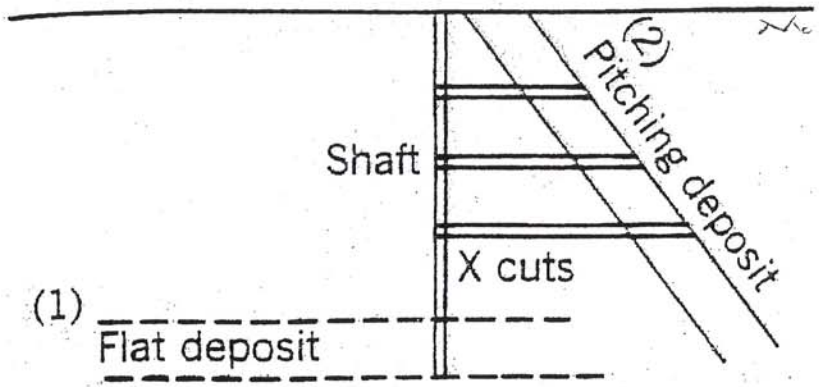
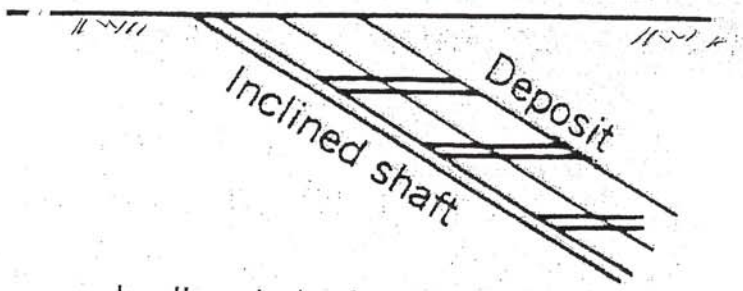
TABLE 1 – Definitions of Access Modes

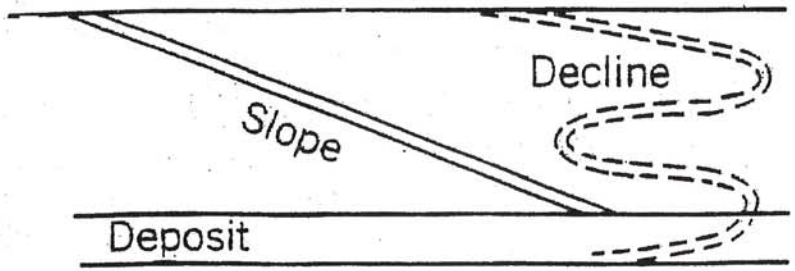
1. *Vertical shaft with hoisting.* For deep horizontal (<30°), vertical, or steeply inclined (>70°) deposits; bad natural conditions; high production; long life.
2. *Inclined shaft with hoisting.* For moderately inclined (30° - 70°) deposit; moderate conditions; low to moderate production and life; shortens horizontal development and allows exploration during sinking.
3. *Slope or decline with haulage* (conveyor or truck). For shallow or medium-depth horizontal deposits; good to moderate conditions; moderate to high production; long life; rope hoisting can be installed and rail haulage can be used; limited to about 12% to 14% with trucks and about 16° with a conveyor (unless special equipment is used).
4. *Drift or adit with haulage* (conveyor, truck, rail, etc.). For shallow outcropping, horizontal deposit or steeply inclined deposit in area of high relief; varied conditions;



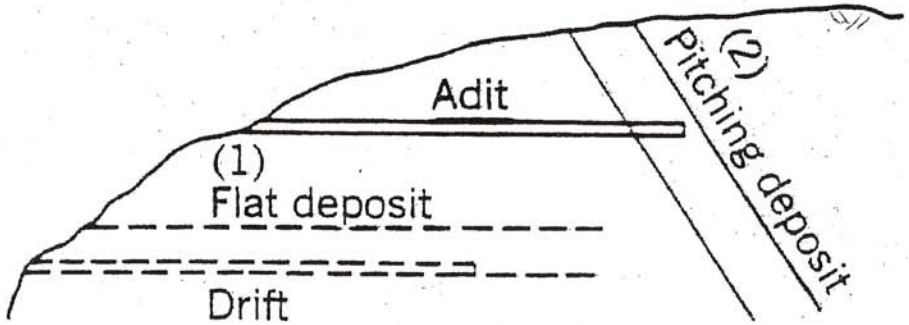
Shaft with hoisting



Inclined shaft with hoisting



Slope or decline with haulage



Adit or drift with haulage

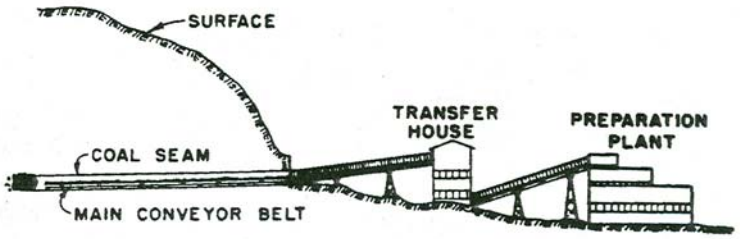
ACCESS MODES

ORE ANDS ACCESS ORIENTATION

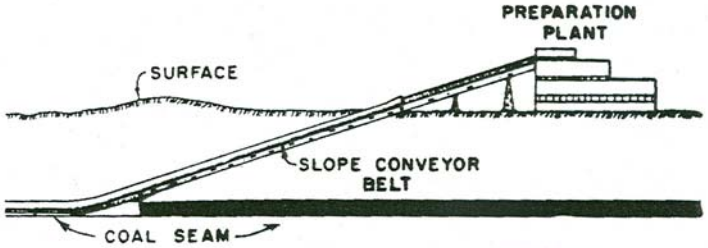
Dip	Mining Method	Comments
Flat	Room-and-pillar mining	Competent horizontal orebody
Flat	Longwall mining	Thin seam-type orebody
Medium	Room-and-pillar mining	Competent orebody
Medium	Inclined room-and-pillar mining	Slope precludes mechanization
Medium	Step room-and-pillar mining	Stepping allows mechanization
Medium	Longwall mining	Thin seam-type orebody
Medium	Cut-and-fill mining	Firm orebody; selectivity; mechanization
Medium	Square-set mining	High-grade ore; labor-intensive
Steep	Sublevel stoping	Competent ore with regular boundaries
Steep	Shrinkage stoping	Competent ore, regular boundaries, delayed ore recovery
Steep	Cut-and-fill mining	Firm orebody; selectivity; mechanization
Steep	Sublevel caving	Large orebody; extensive development effort
Steep	Block caving	Massive orebody; extensive development effort
Steep	Longwall mining	Thin seam-type orebody
Steep	Square-set mining	High-grade ore; labor intensive

OREBODY ORIENTATION

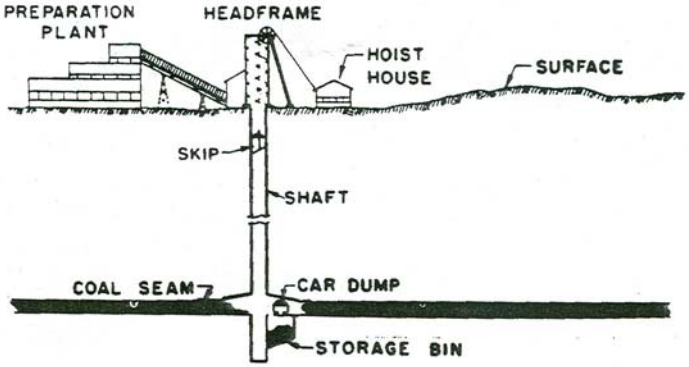
MINING METHODS



DRIFT MINE

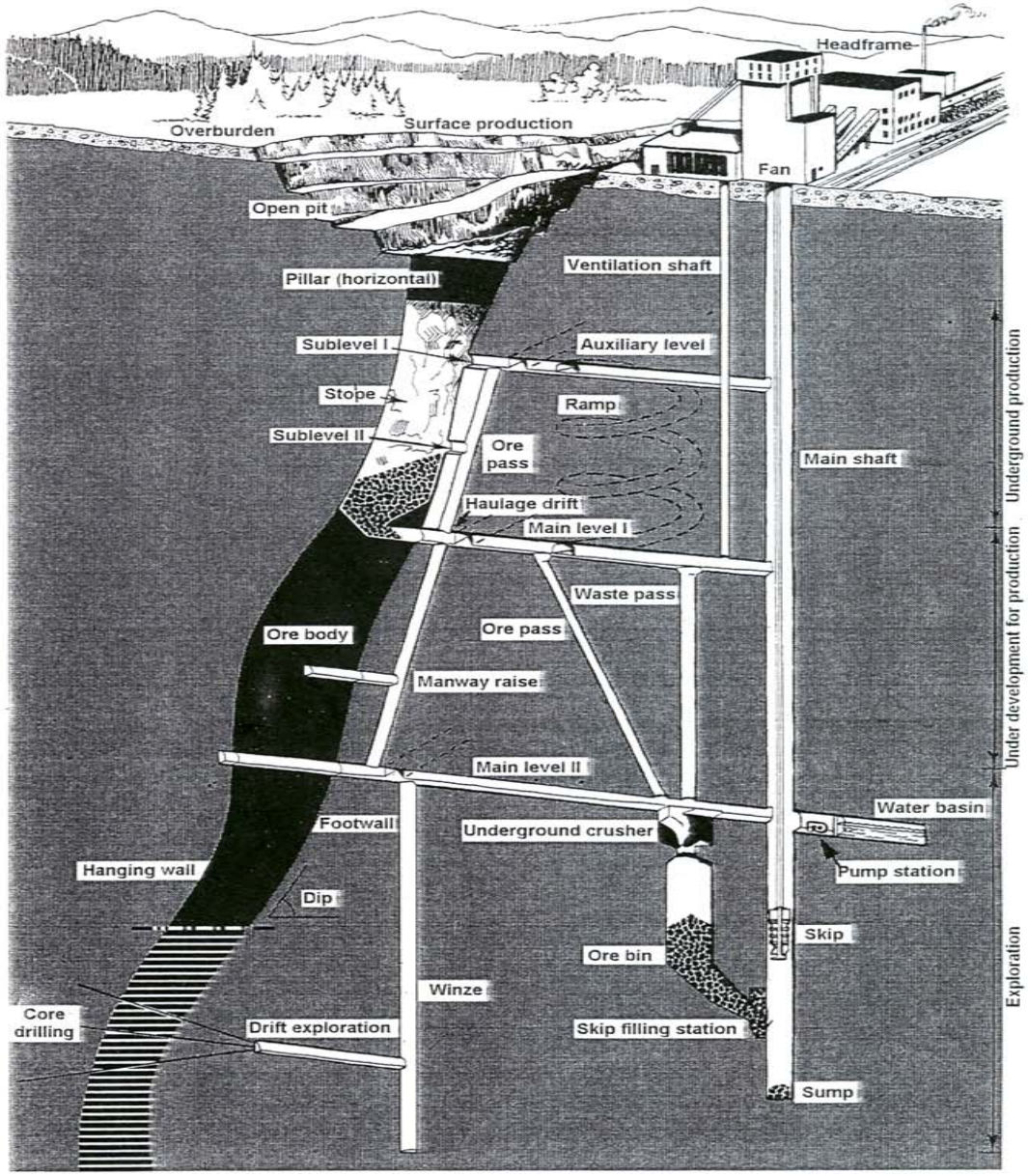


SLOPE MINE



SHAFT MINE

COMMON TERMS FOR MINE ACCESS

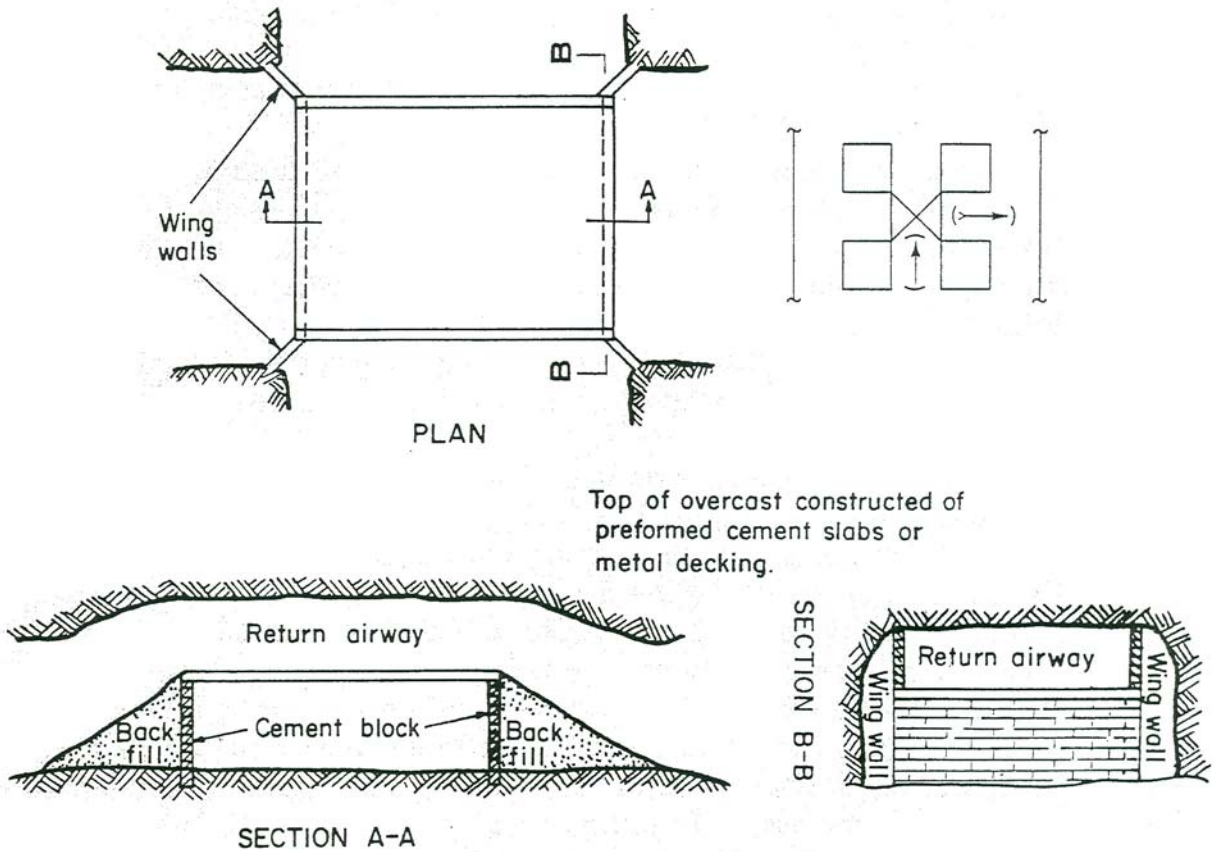


HARDROCK MINE

MINING TERMS

MINE MAPS
COMMON SYMBOLS

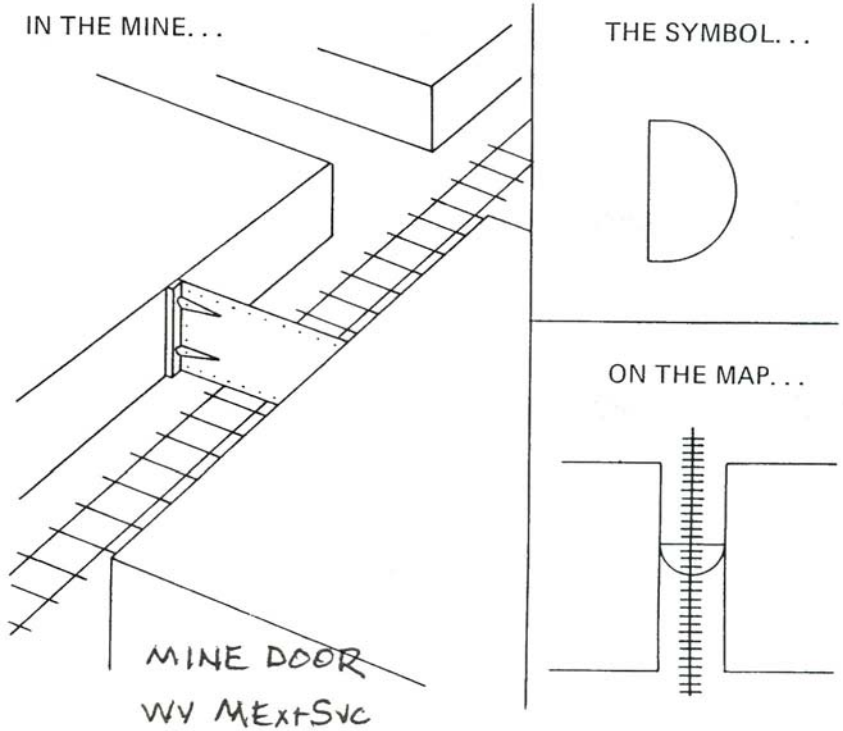
INTAKE	RETURN	OVERCAST	UNDERCAST	CHECK CURT.
FAN& TUBING	42"/90# TRACK & DES.	TEMPORARY STOP.	PERMANENT STOP.	REGULATOR
SEAL	BOX CHECK	LOADING STAT.	STOPPING W/DOOR	MINE DOOR
RECTIFIER	31 POWER CENTER	PERMANENT PUMP	DRAIN DITCH	SUMP
1/64 SPAD & DES.	PILLARED AREA*	EXISTING PILLARS*	825 ELEVATION & DES.	LINE CURTAIN
4-1-80 FACE & DATE	GENERAL MINE	DUEL COMP. SHAFT	SLOPE OR DRIFT	OUTCROP
POWER BORE HOLE	OIL WELL	MINE EXPLORATION	AIR SHAFT	GENERAL SHAFT
STA 4 SURFACE TRAV. STAT.	MINE FAN	S SURFACE SUBSTATION	BREAKER SWITCHHOUSE	POWER FEEDER
DDH 91 DIAMOND DRILL HOLE	GAS WELL	15 STRIKE& DIP	ROOF BOLTS**	ENTRY PROJECTION
DISTRIBUTION BOX.	MOTOR CONTROL/START	BATTERY CHARGING STA.	SWITCHHOUSE	GENERALIZED HAZARD



(COURTESY OF MSHA)

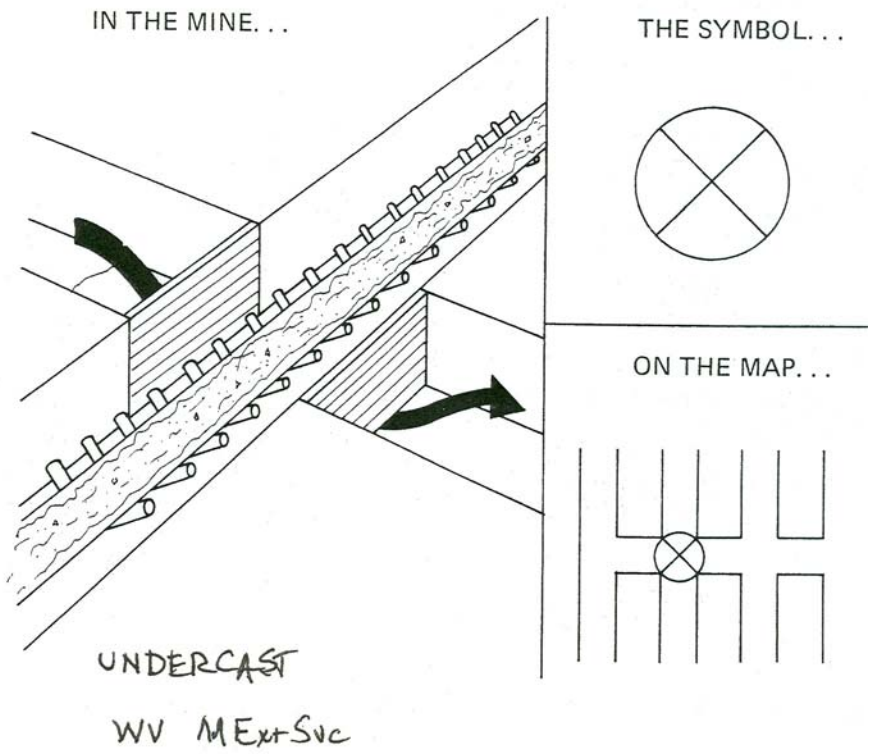
HIGH CAPACITY OVERCAST

MINE MAPS
OVERCAST STRUCTURE



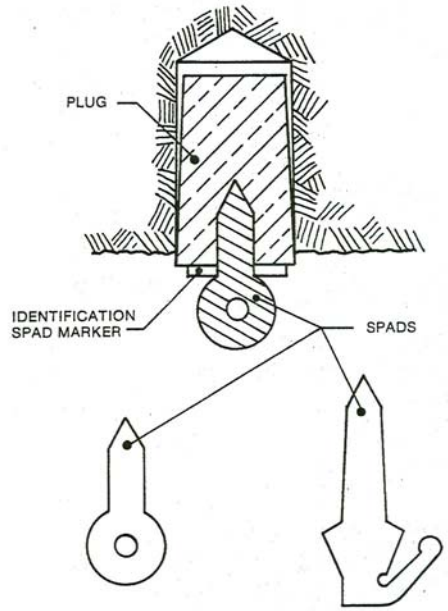
SYMBOL / MAP

CONCEPTUAL VIEW



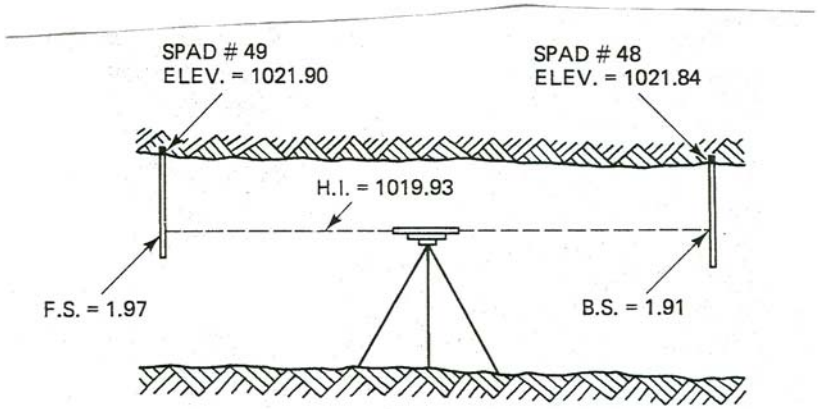
SYMBOL / MAP

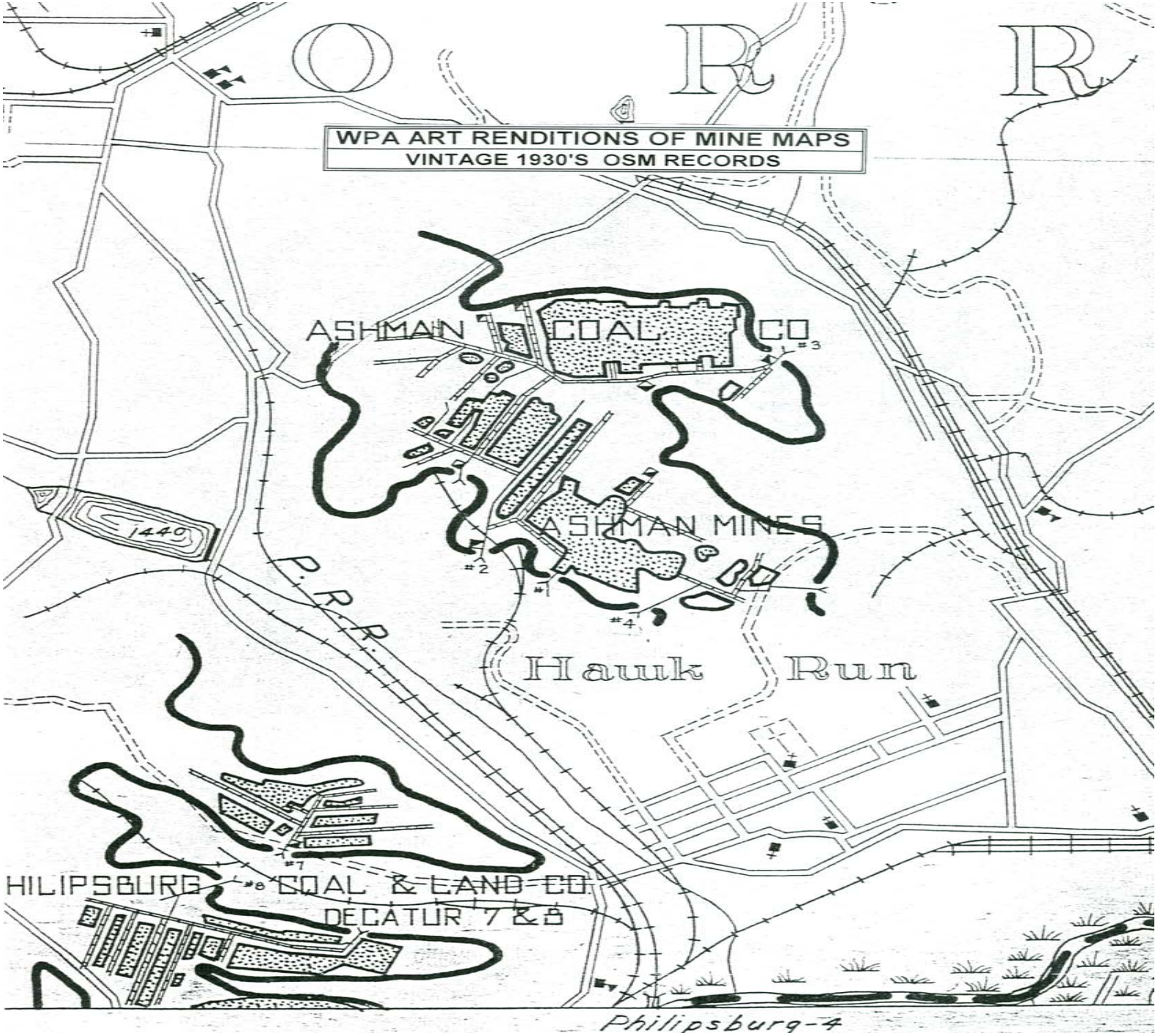
CONCEPTUAL VIEW

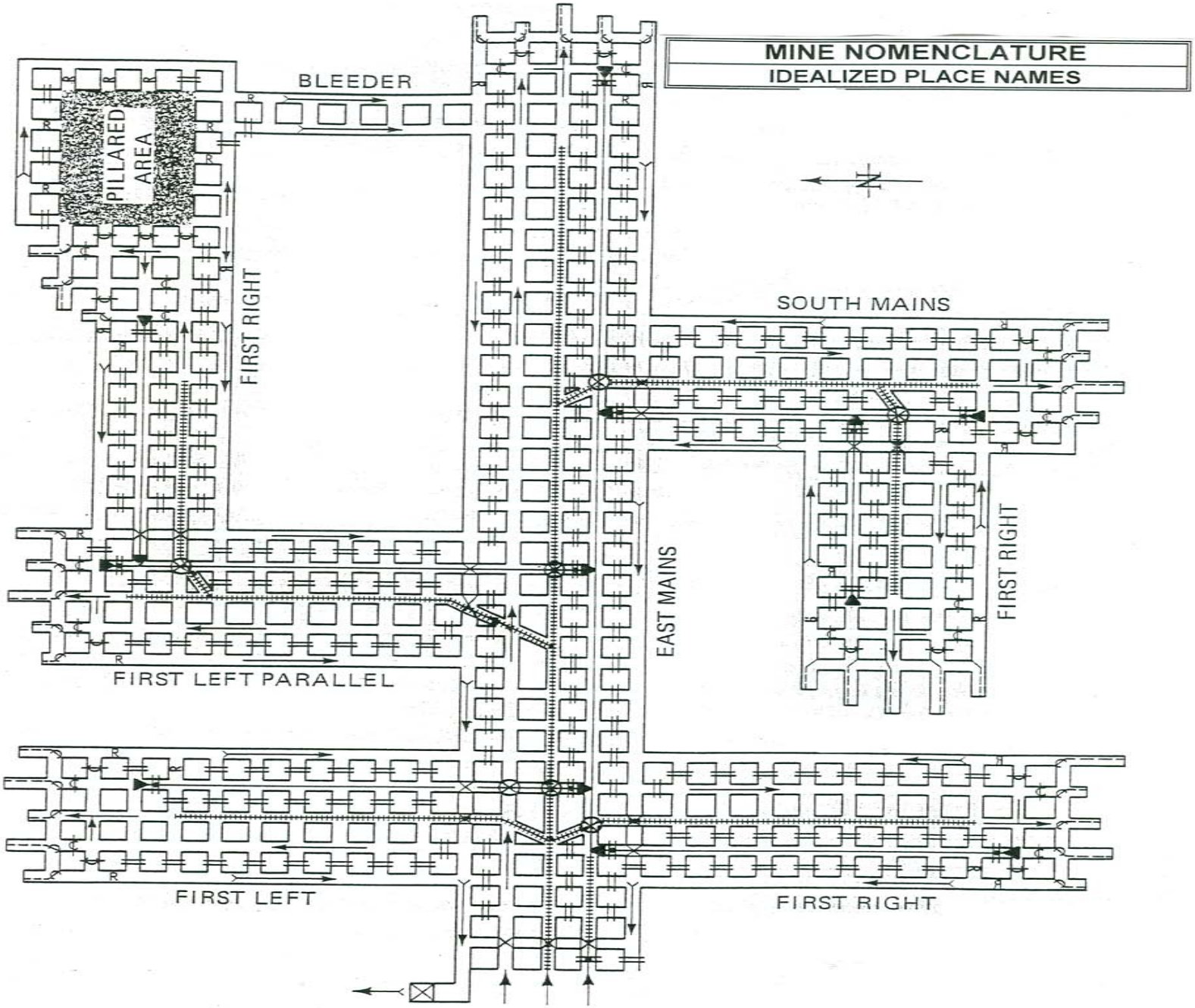


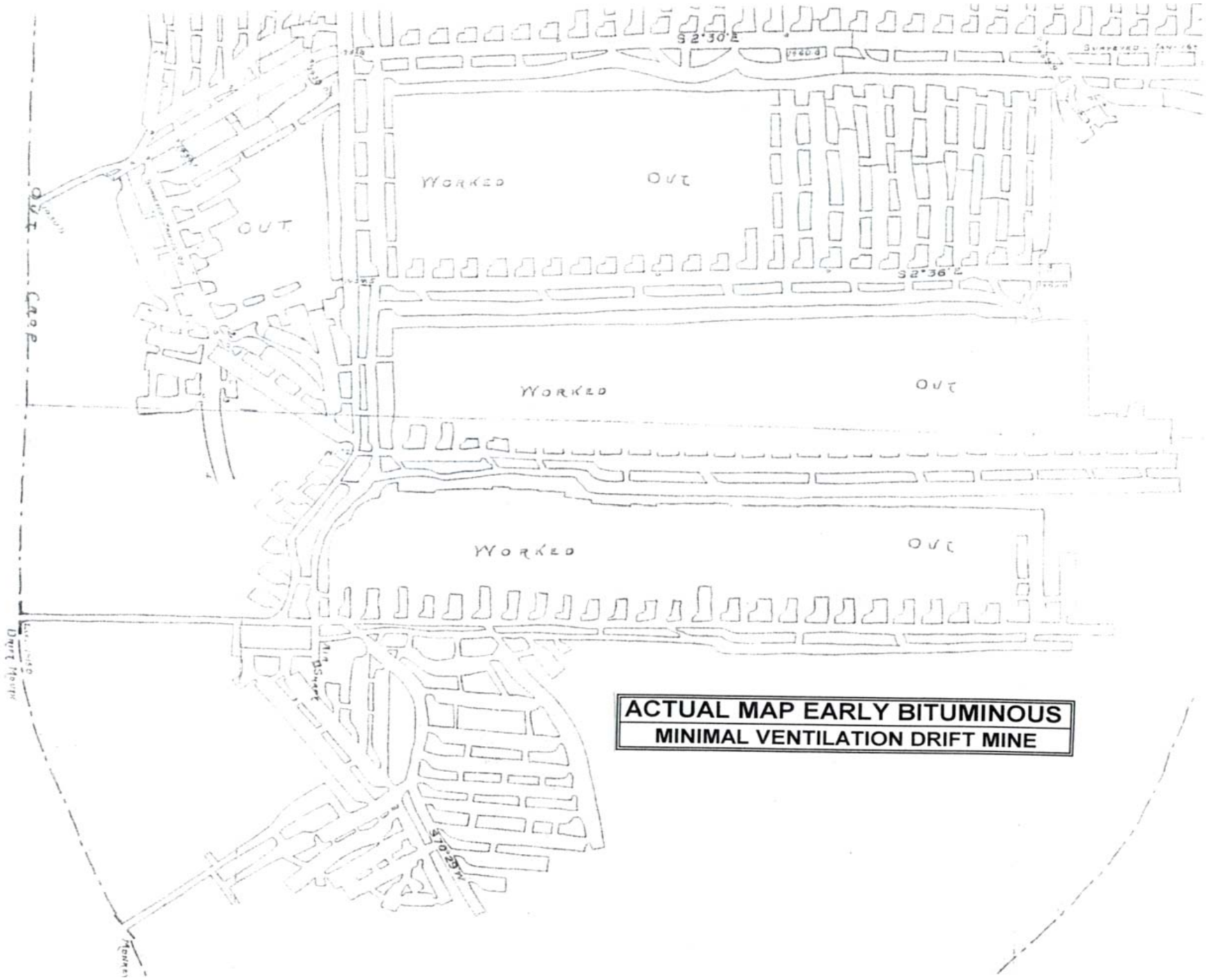
UNDERGROUND MINE SURVEY

REFERENCE POINT ROOF SPAD

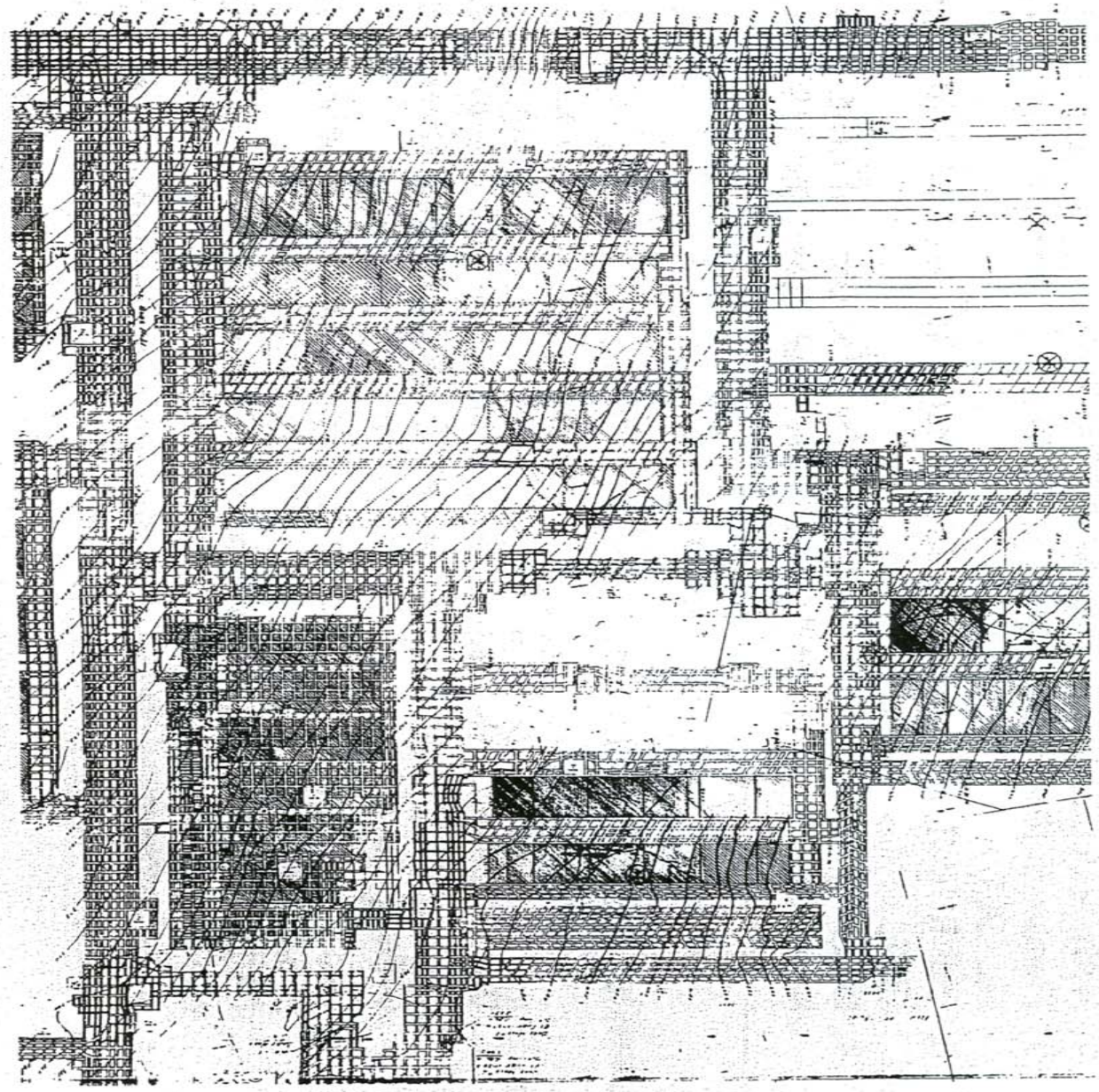



WPA ART RENDITIONS OF MINE MAPS
VINTAGE 1930'S OSM RECORDS
ASHMAN COAL CO.
#3
ASHMAN MINES
#2
#1
#4
1449
P.R.R.
Hauk Run
#7
#8
HILIPSBURG COAL & LAND CO.
DECATUR 7 & 8
Philipsburg-4


MINE NOMENCLATURE
IDEALIZED PLACE NAMES
BLEEDER
PILLARED AREA
FIRST RIGHT
SOUTH MAINS
EAST MAINS
FIRST RIGHT
FIRST LEFT PARALLEL
FIRST LEFT
FIRST RIGHT
N

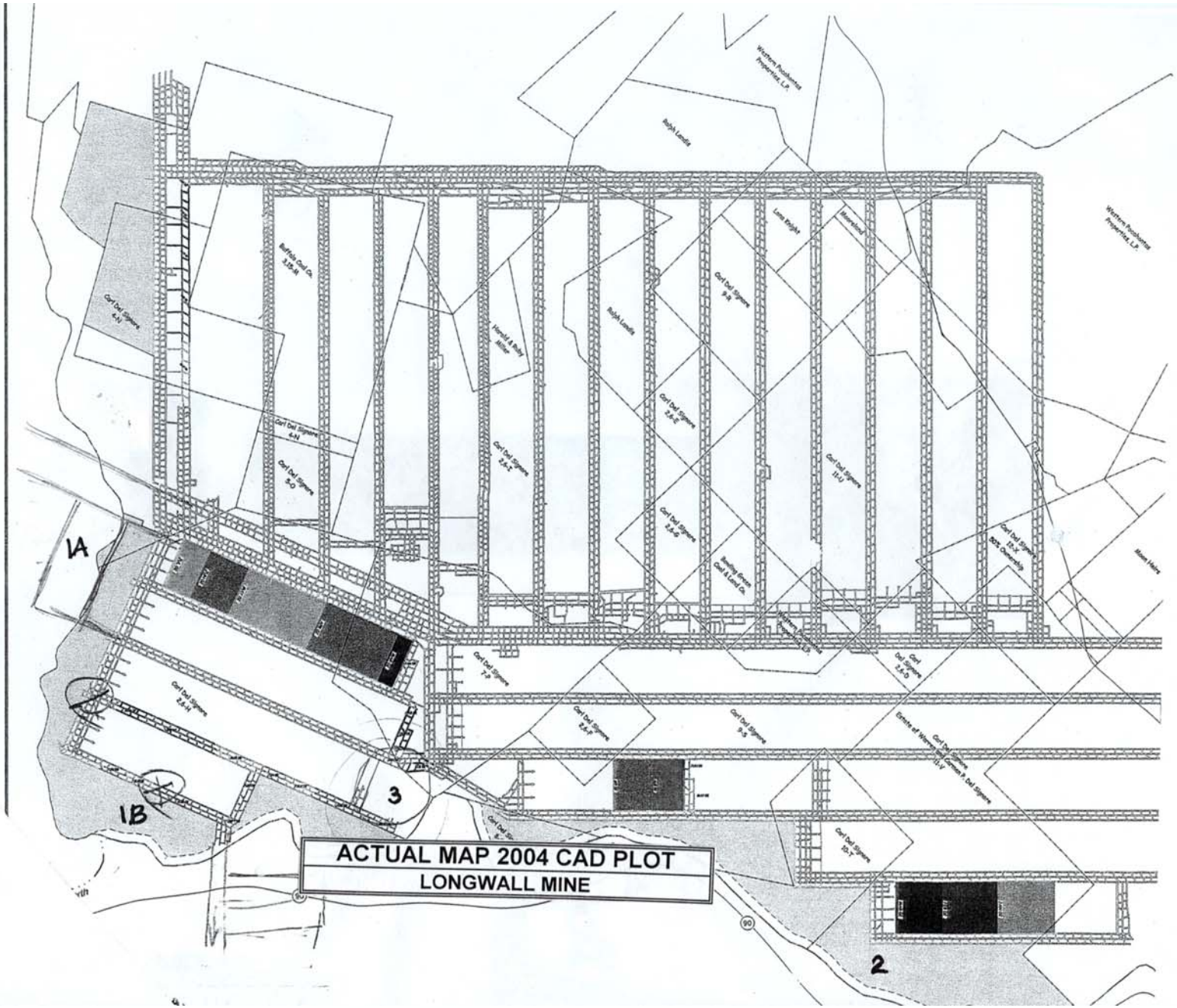


ACTUAL MAP EARLY BITUMINOUS
MINIMAL VENTILATION DRIFT MINE



ACTUAL MAP 1970'S BITUMINOUS

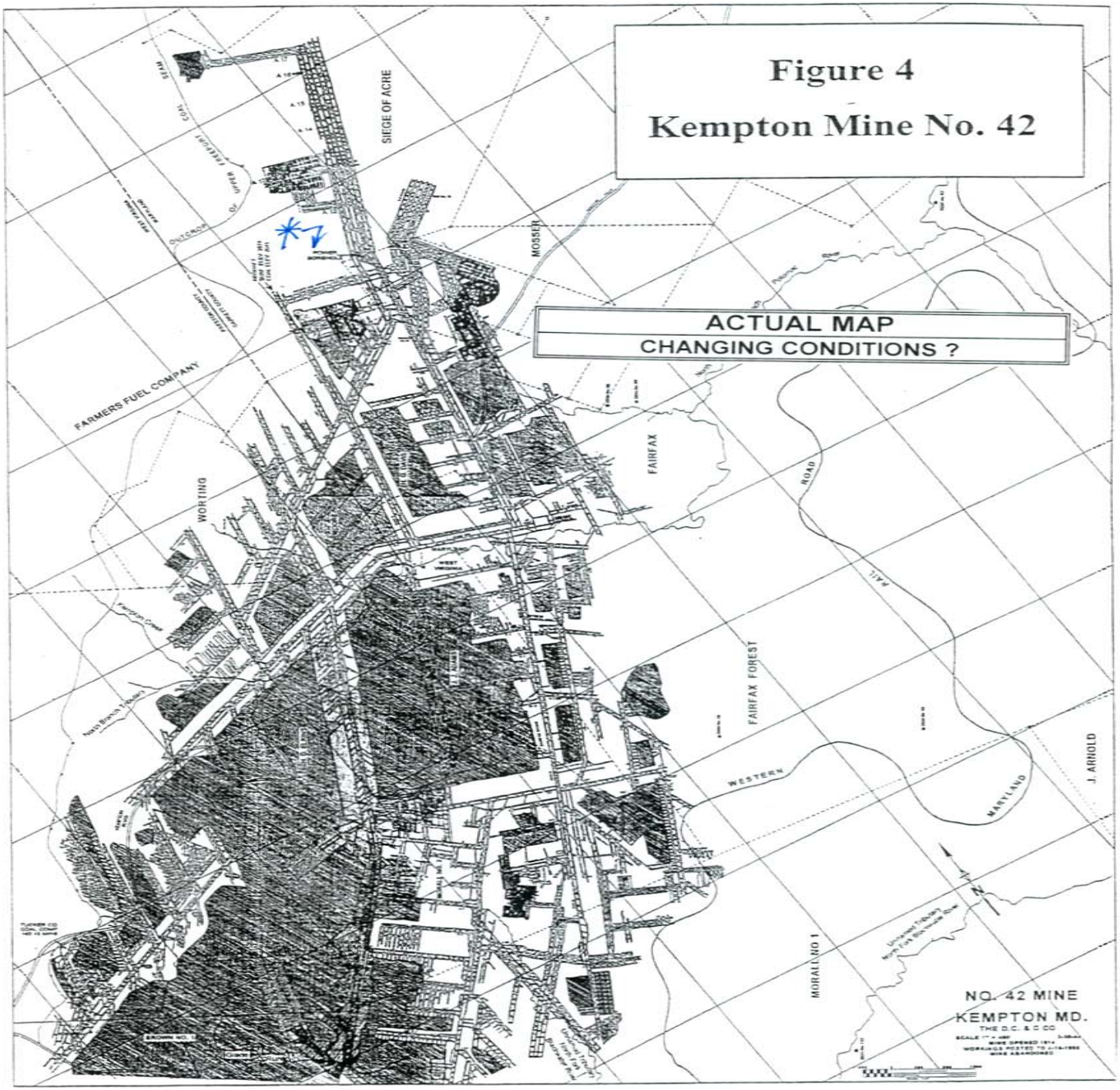
LONGWALL MINE DRIFT ENTRIES



ACTUAL MAP 2004 CAD PLOT
LONGWALL MINE

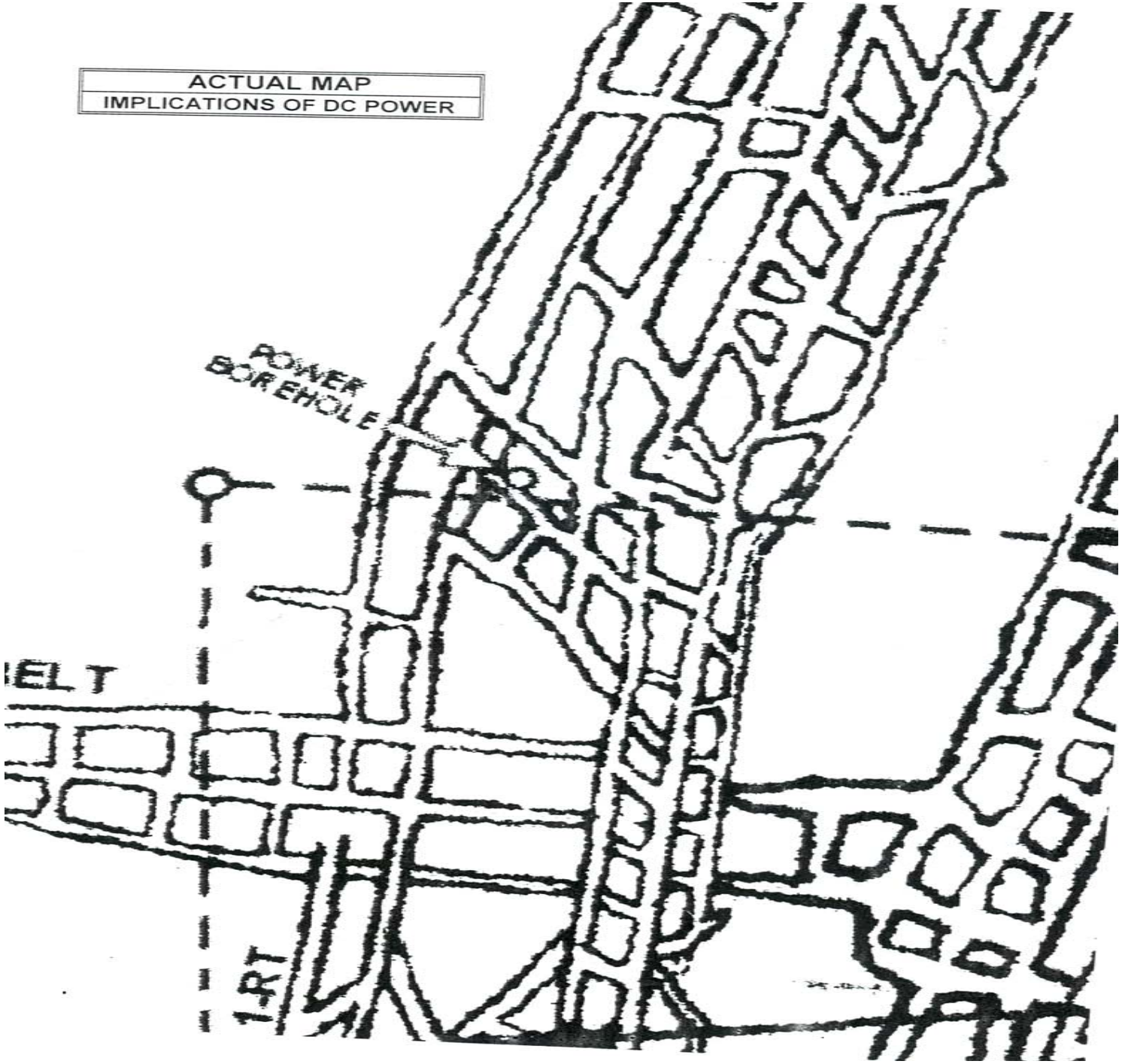
Figure 4

Kempton Mine No. 42

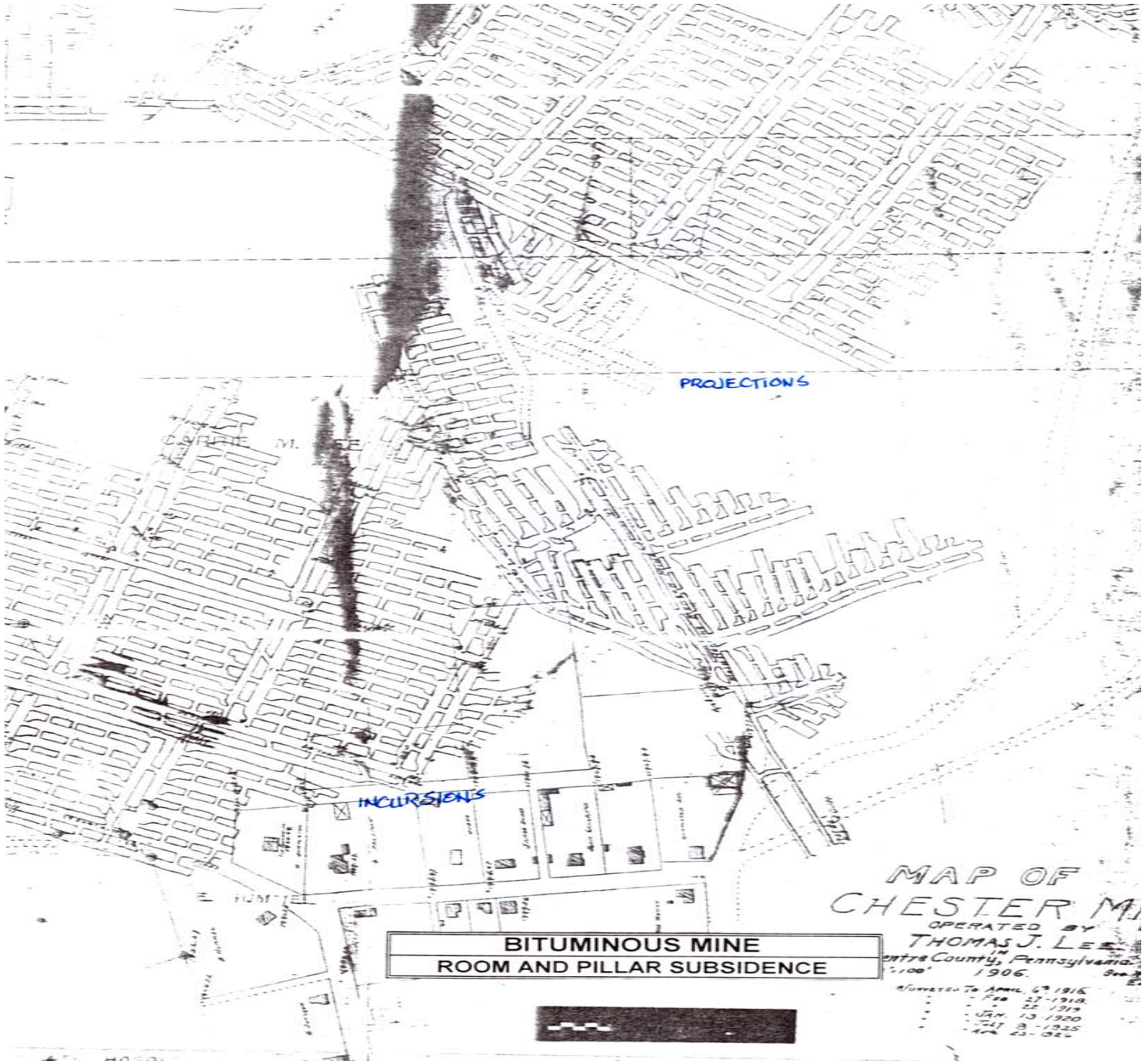


ACTUAL MAP

IMPLICATIONS OF DC POWER



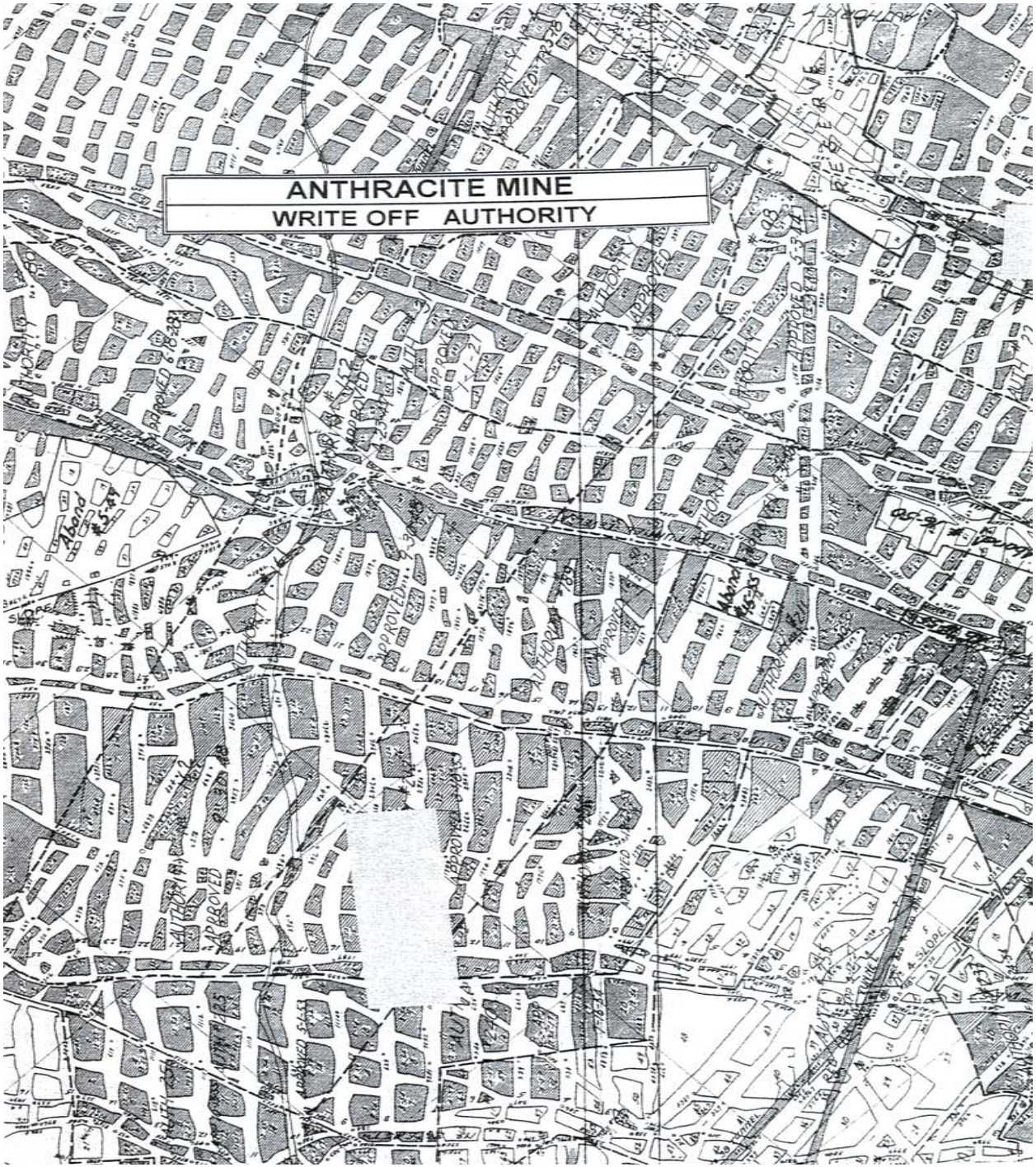
GRANT LINES
ANTHRACITE MINE
PROPERTY OWNERSHIP
SMALL LOTS
STERLING
LEHIGH
GERMANIA
WILKES - BARRE TOWNSHIP
A GRAY
ASHLEY BOROUGH
HANOVER TOWNSHIP



BITUMINOUS MINE

ROOM AND PILLAR SUBSIDENCE

ANTHRACITE MINE
WRITE OFF AUTHORITY



ANTHRACITE MINE

TUNNELS / BAD CONDITIONS