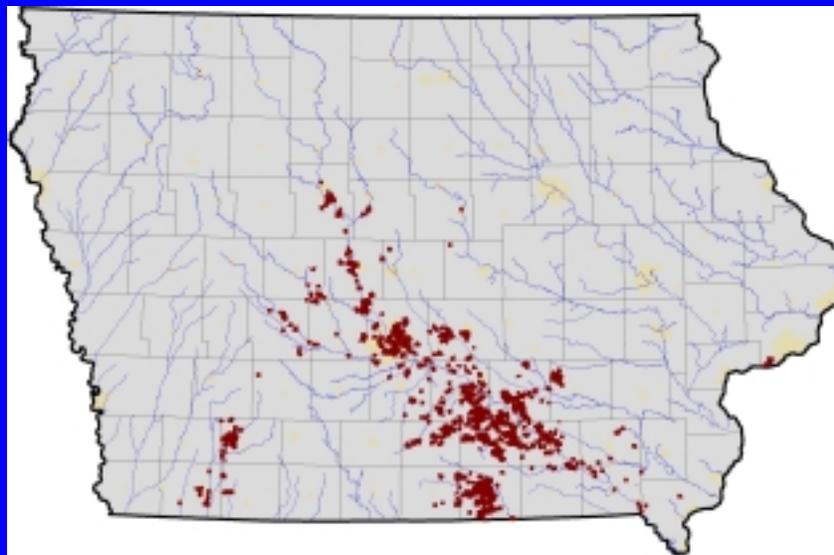


## Abandoned Underground Coal Mines in Iowa - Information Sources

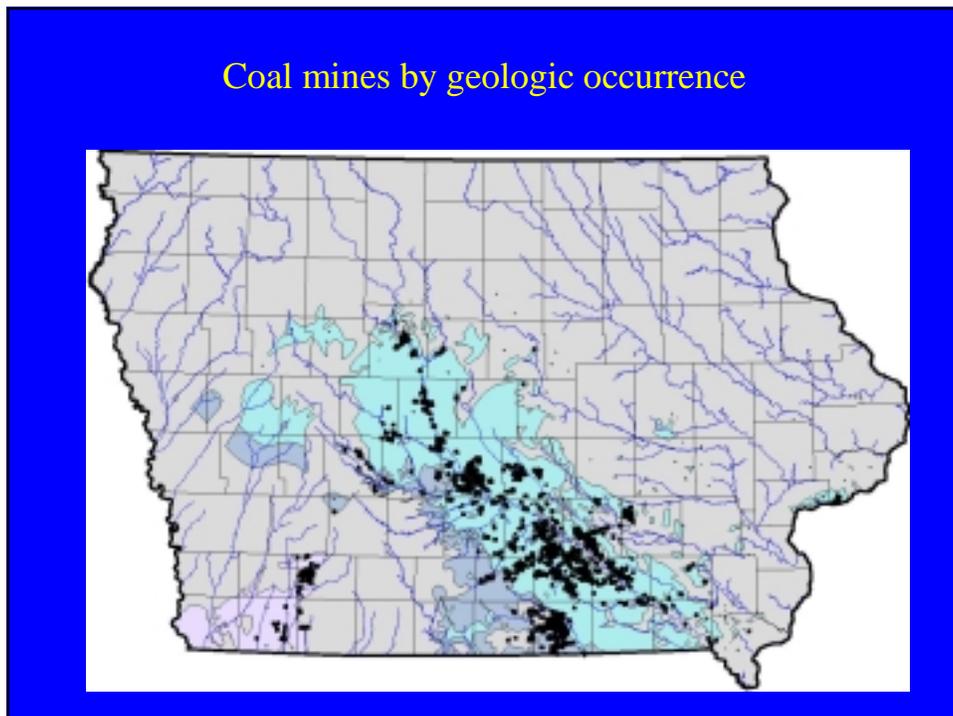
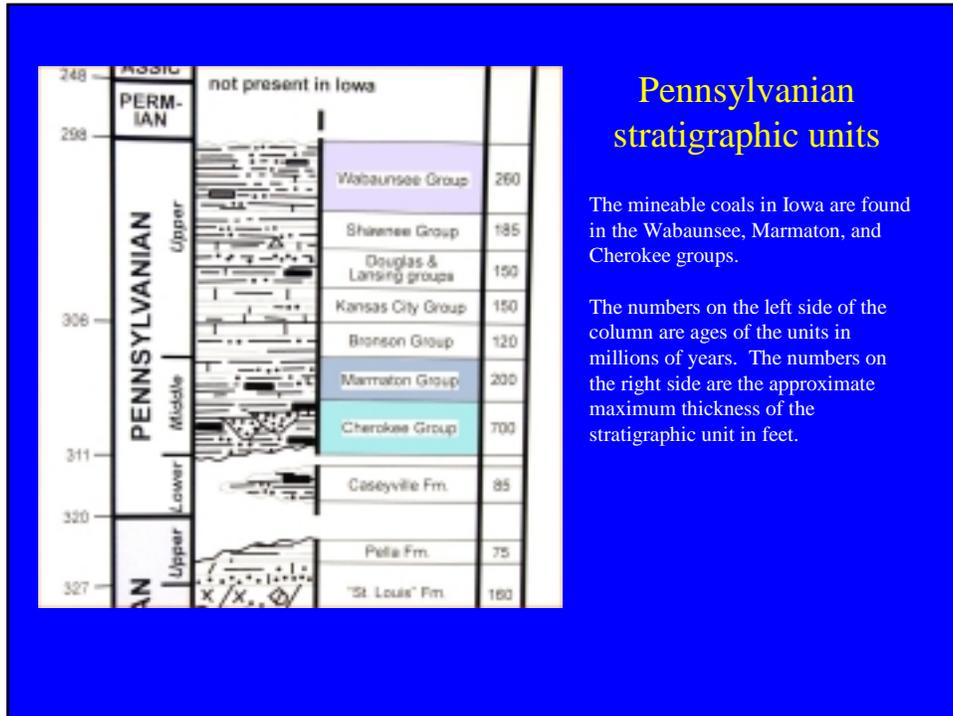


*Lithograph from State Historical Society of Iowa*

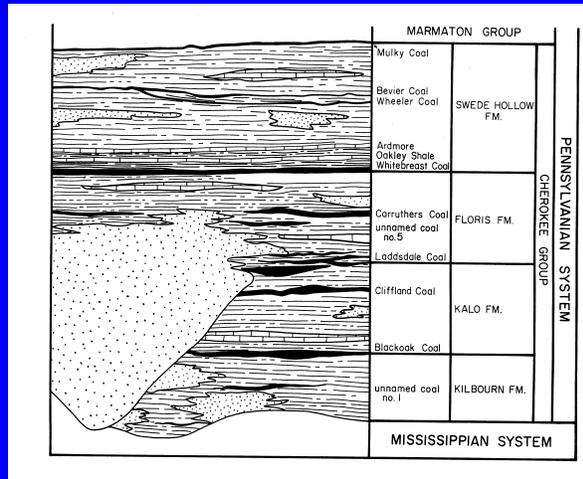
## Distribution of abandoned coal mines in Iowa



*Note: Mined extents have been exaggerated for the purpose of preparing this map*

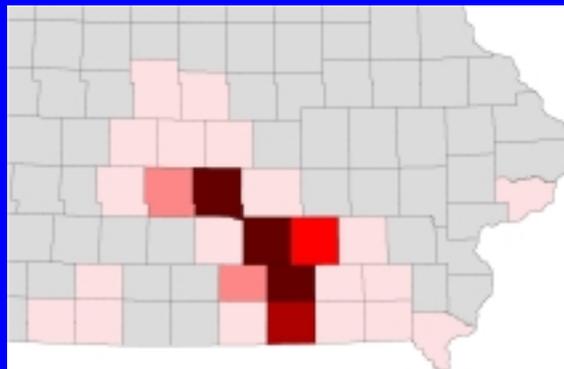


### Cherokee Group stratigraphy details



Most coal mined from the Cherokee Group was produced from the Kalo and Laddsdale formations, although all of the coal seams were probably mined. The irregular, discontinuous character of the coal seams in these formations was partially responsible for the distribution of mining in southeastern and southcentral Iowa.

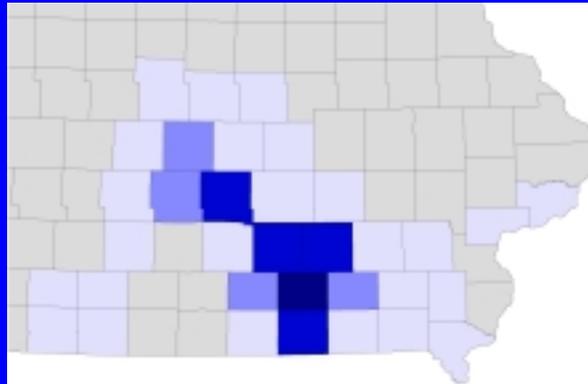
### Mined-out area by county



County	Total acreage
Monroe	17,526
Polk	14,944
Marion	14,354
Appanoose	11,184
Mahaska	9,496
Dallas	4,712
Lucas	4,343
Wapello	2,916
Boone	2,213
Jasper	1,484
all others	3,697
<b>Total</b>	<b>86,867</b>

*Note: Acreage includes only mines with known or approximate extents*

### Summary of coal production 1840 - 1994



County	Total Production
Monroe	69,633,596
Polk	50,972,564
Appanoose	46,292,307
Mahaska	43,409,462
Marion	42,952,114
Lucas	20,363,149
Boone	18,882,017
Dallas	15,685,701
Wapello	14,994,198
Jasper	10,337,117
all others	25,349,015
<b>Total</b>	<b>358,871,240</b>

### Significant events in coal mine data management

- 1840's - Earliest known coal mining near Ft. Des Moines and along the Des Moines River in southeast Iowa. Little information remains.
- 1865 - Council Bluffs named as the eastern terminus of the Union Pacific Railroad. Four railroad companies begin laying track across Iowa.
- 1880's - Iowa coal industry undergoes rapid expansion in response to demand for coal for the railroads.
- 1884 - Law passed requiring survey maps of all coal mines to be filed with the State Mine Inspectors' office on a biennial schedule. Compliance was variable.
- 1910 - Peak year of coal production in Iowa: 7.9 million short tons
- 1969 - State Mine Inspector prepares township maps showing mined areas.
- 1973 - State Mine Inspectors' files, maps, and survey maps were transferred to the Iowa Geological Survey.
- 1987 Coal mine database developed and mine map preservation project started.
- 1990 - Coal mine geographic information system database is developed.
- 1994 - Last (to date) operating coal mine in Iowa closed.
- 2002 - Prototype of world wide web accessible coal mine database.

### Mine map storage cabinets



Mine maps are sorted by size and stored in cardboard boxes in these cabinets

### Additional mine map storage



Large custom-made storage cabinet holds maps up to 57" x 108"

### Database records for Merle Hay Coal Co. mine

Rec #	Site Name	Map ID	Mine name on map	Last revision of map
1	Merle Hay Coal Co.	1487	merle hay coal co.	01/17/1947
2	Merle Hay Coal Co.	1281	beck coal co. mine	01/17/1947
3	Merle Hay Coal Co.	1280	beck coal co. mine	08/01/1946
4	Merle Hay Coal Co.	1185	beck coal co.	—J. A. 1938
5	Merle Hay Coal Co.		beck coal co. coal co.	—J. A. 1938
6	Merle Hay Coal Co.	1587	beck coal co.	07/23/1937
7	Merle Hay Coal Co.	0035	beck coal co.	07/23/1937
8	Merle Hay Coal Co.	0037	beck coal co.	11/03/1896
9	Merle Hay Coal Co.	0036	beck coal co.	11/14/1896
10	Merle Hay Coal Co.	0034	beck coal co.	06/12/1893
11	Merle Hay Coal Co.	0971	beck coal co.	06/20/1894

Each mine site has one or more records in the Coalmine database to record individual maps or other documentation of the mining activity on the site. The records are arranged in reverse chronological order where possible.

### Data elements captured in the coal mine database and later transported to the GIS database

Site ID	17628	Site ID	27628
Site name	Merle Hay Coal Co.	Site name	Merle Hay Coal Co.
Sequence No.	1	Sequence No.	2
No. of Site Records	11	No. of Site Records	11
County	des moines co.	County	des moines co.
Central location	no no no 24 4579s 25w	Central location	
Area location #1	no no 24 4579s 25w	Area location #1	
Area location #2	no no 24 4579s 25w	Area location #2	
Area location #3	no no 24 4579s 25w	Area location #3	
Area location #4	no no no 11 4579s 25w	Area location #4	
Map name	merle hay coal company beck coal mine	Map name	beck coal mine
Map ID	1487	Map ID	1281
Last revision date	01/17/1947	Last revision date	01/17/1947
Map storage location	01	Map storage location	04
Map size	28 in. x 48 in.	Map size	28 in. x 48 in.
Map scale	1 in. = 100 ft.	Map scale	1 in. = 100 ft.
Movable map	Yes	Movable map	Yes
Owner/supervisor	otto h. swanson	Owner/supervisor	
Opening date	1942	Opening date	1942
Closing date	1947	Closing date	1947
Mining method	room and pillar	Mining method	room and pillar
Mine entrance type	shaft	Mine entrance type	shaft
Surface elevation	300 ft.	Surface elevation	0 ft.
Shaft depth	200 ft.	Shaft depth	0 ft.
Coal seam	Union	Coal seam	Union
Coal seam elevation	700 ft.	Coal seam elevation	0 ft.
Database	SurveyMap	Database	SurveyMap
Additional notes	This mine may have also been known as Beck Coal and Mining. Longwall and room and pillar methods were used in this mine. This was one of the last mines to operate in Polk Co.	Additional notes	

## Publications

Harl, N. E., et al., 1977, *Coal mine maps for eight Iowa counties*, Iowa State University

VanDorpe, P. E., et al., 1984, *Underground mines and related subsidence potential, What Cheer, Iowa*, Iowa Geological Survey, Open File Rpt. 84-3

Howes, M. R., et al., 1986, *Underground coal mines of Centerville, Iowa and vicinity*, Iowa Department of Natural Resources, Open File Rpt. 86-2

Howes, M. R., et al., 1989, *Abandoned underground coal mines of Des Moines, Iowa and vicinity*, Iowa Department of Natural Resources, Open File Rpt. Tech. Paper 8

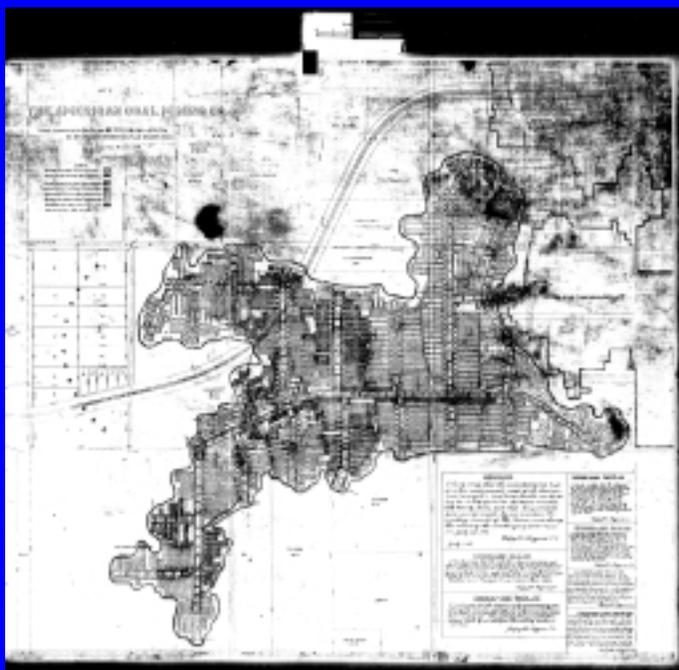
## Developing the Coalmine Geographic Information System database

Mine sites were classified into seven categories based on the geographic information available

- Surface
- Underground
  - Surveyed mine map with good location references-known location and extent
  - Surveyed mine map with poor location references-known extent, approx. location
  - State Mine Inspectors' township maps-known location and approx. extent
  - State Mine Inspectors' files, IGS publications, etc.-unknown extent, location approx. to 1/4 section or smaller
  - State Mine Inspectors' files, IGS publications, etc.-unknown extent, location approx. to one section
  - State Mine Inspectors' files, IGS publications, etc. - unknown extent, unknown location

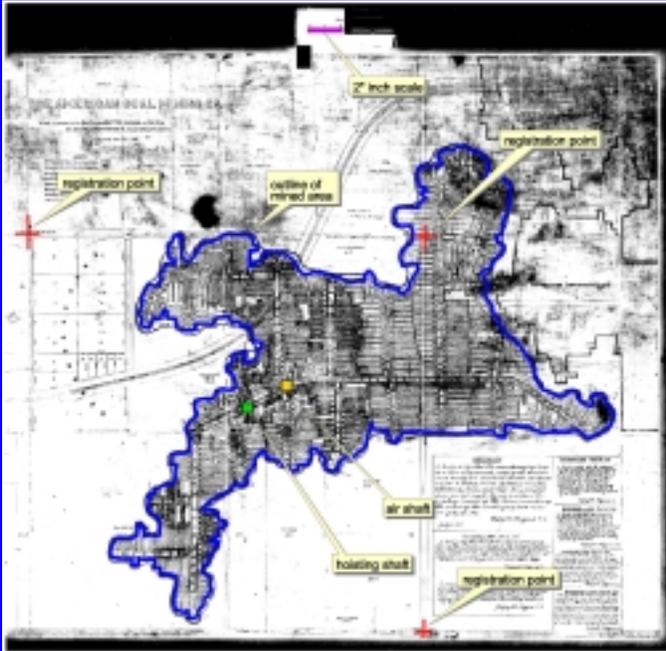
## Developing the Coalmine Geographic Information System database

- This process was streamlined by the earlier development of the Coalmine database which had already identified the mine sites and all associated maps and other data, as well as the most recent map for the site.
- Mine outlines, shaft locations, and registration marks were digitized with Autocad from the photographs taken as part of the mine map restoration project. Generally the map with the latest revision was selected unless the condition of the map was such that it could not be digitized.
- Coordinate conversion was performed with Autocad using 7.5' topographic maps by selecting points on the quadrangle that corresponded to the registration marks digitized with the mine data.
- Data was exported from Autocad files and imported into pcArcInfo as a polygon coverage (mine outlines) and a point coverage (shaft locations)
- Identifiers linking the outline to the Coalmine database were added to the attribute tables
- Attributes were added from the Coalmine database



### Surveyed mines

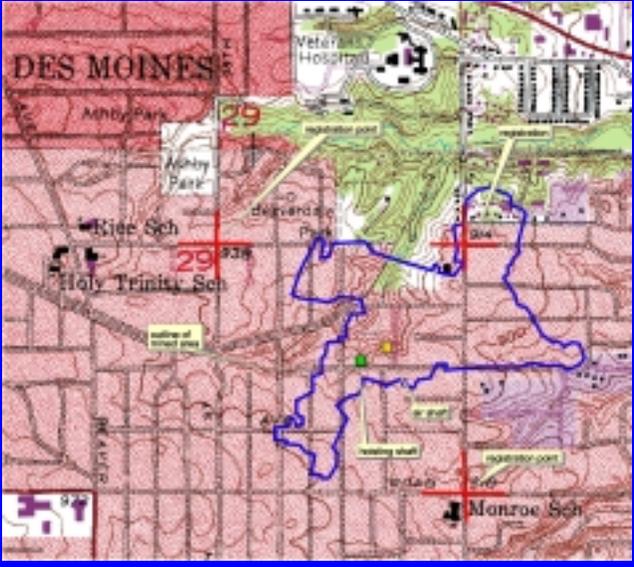
Scanned negative of  
underground mine map.



**Surveyed mines**

Features of mine maps that were digitized:

- outline of mined-out area
- two or more registration points and the scale
- or-
- one registration point, a directional feature, and the scale
- mine entrances



**Surveyed mines**

Registration of digitized outline and shaft locations to 7.5' topographic map

### Surveyed mines

Site ID	77025
Site name	American Coal Mining Co.
Sequence No.	1
No. of Site Records	3
Coordinates	see notes on 25'073n Qlar
Area location #1	see notes on 25'073n Qlar
Area location #2	see notes on 25'073n Qlar
Area location #3	see notes on 25'073n Qlar
Area location #4	see notes on 25'073n Qlar
Map name	American coal mining company
Map ID	0800
Last revision date	03/01/1995
Map storage location	525
Map size	40 in x 40 in
Map scale	1 in = 100 ft
Mobile map	Yes
Owner/supervised	see notes
Opening date	1912
Closing date	1919
Mining method	room and pillar
Mine entrance type	shaft
Surface elevation	0 ft
Shaft depth	0 ft
Coal seam	Blackshale
Coal seam elevation	0 ft
Data type	Surveyed map
Additional notes	The "Old Mine" was closed at this site. It is assigned to the currently accepted name Blackshale Coal. The name of the Mine & Evans Coal Co. appears on the back of one of the maps for this mine suggesting that the mine map

Typical data elements for mines with surveyed mine maps

### Mines with survey maps, but poor locations

Maple Block Coal Co.

Mines in this category have a survey map, but no usable registration points were found on the map. The location is used is descriptive, e.g. SW, NW, Sec. 30, T. 79 N., R. 24 W., as with the mine shown. The description was found on the map in most cases, but may have come from other sources.

Note the air and hoisting shaft locations.

Site ID	77895
Site name	Maple Grove Mine Shaft No. 1
Sequence No.	1
No. of Site Records	3
Quadrangle	des moines rd
Control location	see no 30 4576a c23a
Area location #1	see no 30 4576a c23a
Area location #2	see no 30 4576a c23a
Area location #3	
Area location #4	
Map name	maple grove mine
Map ID	1542
Last revision date	-/-/unkn
Map storage location	85
Map size	30 in. x 36 in.
Map scale	0 in. = 0 ft.
Microfilm map	No
District/superintendent	A. Johnson
Opening date	1891
Closing date	1963
Mining method	room and pillar
Mine entrance type	shaft
Surface elevation	950 ft.
Shaft depth	105 ft.
Coal seam	Brink
Coal seam elevation	785 ft.
Trunk type	Surveyed map case location
Additional notes	

Typical data elements for mines with survey maps, but poor location references.

### Mine approximate location and extent

No survey maps are available for this data type. Locations and extents are typically from the State Mine Inspectors' township maps (1969). The area shown is probably somewhat larger than the actual mined area.

Site ID	7741
Site name	Iowa Coal and Mining Co.
Sequence No.	1
No. of Site Records	1
Ownership	Wingman
Central location	near T5 R10N R23E
Area location #1	near T5 R10N R23E
Area location #2	
Area location #3	
Area location #4	
Map name	
Map ID	
Last revisor date	--/--/----
Map storage location	
Map type	0 in. x 8 in.
Map scale	0 in. = 0 ft.
Miscellaneous map	No
Owner/superintendent	
Opening date	
Closing date	
Mining method	shaft
Mine entrance type	shaft
Surface elevation	8 ft.
Shaft depth	85 ft.
Coal seam	Union
Coal seam elevation	8 ft.
Data type	Unmapped, indirect approx.
Grid notes	The location and extent of this mine were obtained from maps prepared by the Office of the State Mine Inspector.

Typical data elements for mine with approximate extent from sources other than survey maps

### Mines with approximate locations and unknown extents

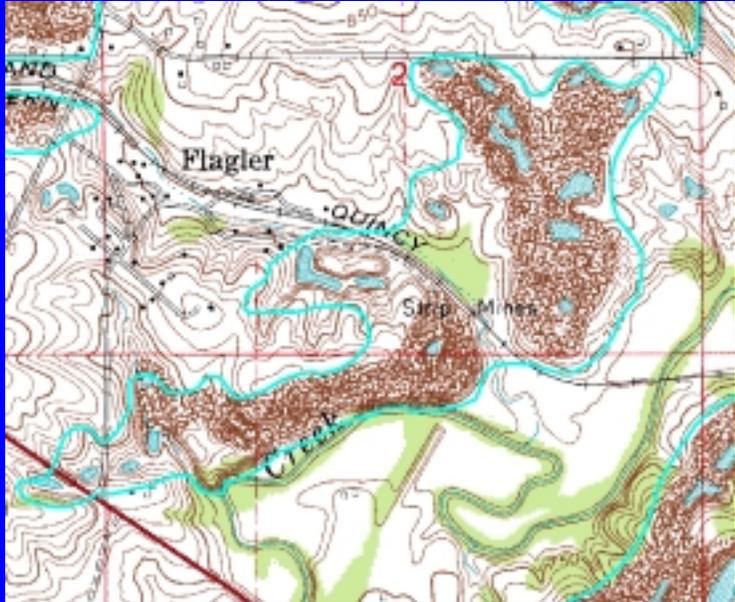
A general description of the location is the only information available for a large number of mines, e. g. NW 1/4, SW 1/4, Sec. 14, T. 76 N, R. 19 W. This information was derived from a variety of sources. Two subcategories were recognized:

- mines that could be located to at least one quarter section
- mines that could be located to one section, but no more precisely.

**Typical data elements for mines known as point locations only**

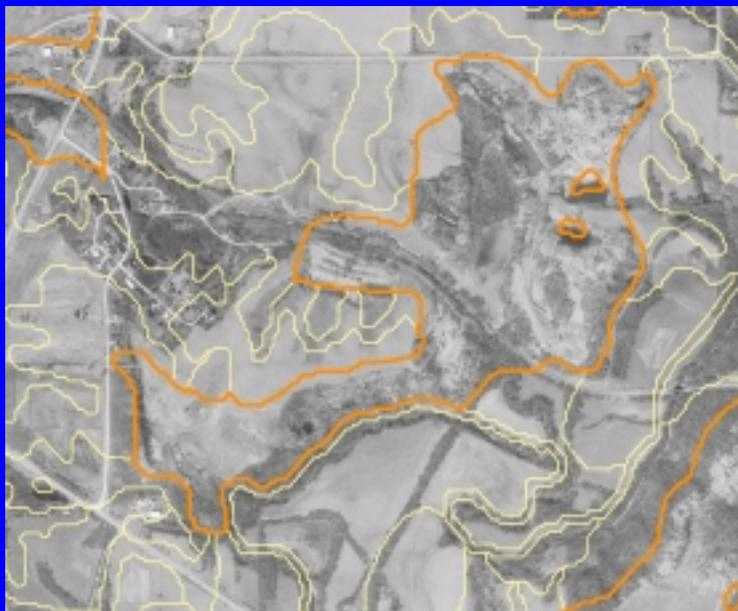
Site ID	0000	Site ID	0000
Site name	Central Valley Coal Company	Site name	West Mine
Sequence No.	1	Sequence No.	1
No. of Site Records	1	No. of Site Records	1
Quadrangle	grange	Quadrangle	grange
Central location	nw on 14 000 x 20e	Central location	14 000 x 20e
Association #1	nw on 14 000 x 20e	Association #1	14 000 x 20e
Association #2		Association #2	
Association #3		Association #3	
Association #4		Association #4	
Map name	no map	Map name	no map
Map ID		Map ID	
Last revision date		Last revision date	
Map storage location		Map storage location	
Map size	0 in x 0 in	Map size	0 in x 0 in
Map scale	0 in = 0 ft	Map scale	0 in = 0 ft
Historic map	No	Historic map	No
Owner/supervised	de aban	Owner/supervised	
Opening date	1888	Opening date	0
Closing date	0	Closing date	0
Mining method	u/n	Mining method	u/n
Mine entrance type	shaft	Mine entrance type	shaft
Surface elevation	0 ft	Surface elevation	0 ft
Shaft depth	112 ft	Shaft depth	43 ft
Coal seam	West seam	Coal seam	unidentified
Coal seam elevation	0 ft	Coal seam elevation	0 ft
Data type	Point location, 1/4 section	Data type	Point location, 1/4 section
Additional notes	(a100) lower half of coal has been mined. West vein coal known to that extent of 1/4 section. Located 0.5 mile south of the storage area.	Additional notes	(a100) this mine was in the same coal seam as the clustered coal mines.

**Surface mines**



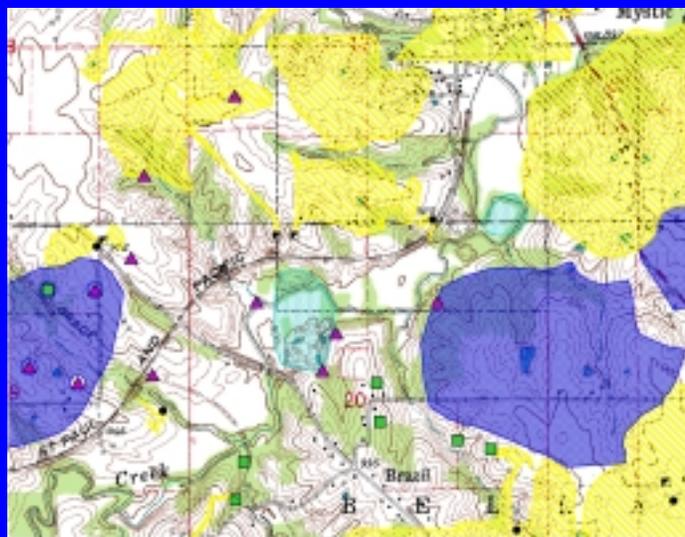
Surface mine data was acquired from 7.5' topographic maps by digitizing around areas marked as strip mines

### Surface mines



Additional surface mine data was acquired from NRCS Soil Survey mapping and orthophoto quarter-quadrangles. The areas outline in orange are mapped as strip-mined lands on the Soil Survey maps.

### Area of extensive underground mining



Five categories of abandoned mine data are shown. The "point location" mines are stored as one-acre round polygons to maintain compatibility with other coal mine data. The one acre areas are not included in acreage totals. On this view, the "point mines" have been converted to marker symbols for display purposes.

### Summary of coalmine data

- Total recorded coal production is 360 million tons over the 150+ year history of mining
- Records of about 5,800 mines are extant
- 3,062 mines can be located within at least one square mile
- About 2,800 mines have only a post office as a location
- 1,619 survey maps representing 765 mine sites are in the IGS archive
- Survey mine maps are on a variety of materials and range from very good condition to very poor
- Smallest map is 9" x 11", the largest 57" x 108"
- Estimated area affected by mines with known extents is 87,000 acres
- 1,480 mines are located as points only
- About 345 surface mines exist

### Iowa coal mine data on the internet

- A copy of this presentation (MS Powerpoint '97) including notes can be downloaded from:

<http://ftp.igsb.uiowa.edu/pub/download/itgaum/presentation.zip> (~26M)

- Demonstration internet application sites:

<http://mortimer.igsb.uiowa.edu/website/flodmine>

-or-

<http://mortimer.igsb.uiowa.edu/website/coalmine>

available 5/6/02