Stratigraphic sequence form manual -- Guide for entering stratigraphic data into the National Coal Resources Data System (NCRDS)

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STRATIGRAPHIC SEQUENCE FORM MANUAL--Guide for entering stratigraphic data into the National Coal Resources Data System (NCRDS)

The purpose of this manual is to:

1. Describe the intended use of the data as related to computerized coal resource assessments.

2. Provide guidelines and suggestions for completing the STRAT forms.

The stratigraphic sequence (STRAT) form(s) and associated point-location map(s) allow data to be 1) stored permanently in the STRAT files of NCRDS, 2) retrieved by any field of entry, and 3) interactively used for currently functioning programs, e.g., drill hole stratigraphic sections, statistics, contouring, resource calculation.

The stratigraphic section point location should be marked by "X" on a topographic map and identified with a unique map I.D. number assigned by the geologist. This same number must be on the STRAT form. Each point location will be digitized from the topographic map to provide latitude and longitude coordinates and the map I.D. number. Each location then has a unique lat/long coordinate and identifier and can be coupled with the STRAT form data in NCRDS files for graphic output. Latitude and longitude values given to the nearest second must be filled in on the STRAT form if providing a point location map is not feasible.

Completion of the heading area and those columns marked (*) on the form is mandatory before a record will be entered.

A list of abbreviations has been compiled for NCRDS use to conserve computer storage. Not all words need to be abbreviated - only those that will be used frequently. The personnel filling in STRAT forms should check the NCRDS abbreviation list before entering data into the appropriate

data fields. If a term is not on the list, but will be used frequently and is longer than 4 characters (one computer unit of storage), contact NCRDS personnel. New abbreviations can then be distributed to all NCRDS users to maintain consistency of data for more rapid retrieval. For those with an account on the Multics computer system the updated list may be obtained by typing "listabb" on your terminal.

The number in parentheses on the STRAT format and preceding data field names on the following pages is the maximum number of alpha (A), numeric (N) or mixed (M) characters that may be entered -- including spaces. Machine will truncate data at these limits.

ALL OF THE ENTRIES MUST BE LEGIBLE OR THE FORM WILL BE RETURNED TO THE SUBMITTER FOR CLARIFICATION.

The following names describe data to be entered in data fields on the STRAT format sheet (see Figure 1 for sample completed STRAT Format).

(20M) GEOLOGIST (Project Leader) - Last First initial Middle initial (no punctuation).

Agency abbreviation prefix will be added by NCRDS personnel

(16A) STATE AND COUNTY - self-explanatory.
(24A)

Enter only one county name. This allows for retrieval of data by county at a later date. Do not use abbreviations.

(16A) PROVINCE AND REGION - enter appropriate names as shown in Figures 2 and 3.
(24A)

(28M) QUAD NAME & SERIES - enter as shown on map sheet or USGS index map,

e.g, Homestead Draw SW (7.5')

The possibilities for series are 7.5', 15', 30', 1°, and 2°.

(16A) COAL FIELD - enter name (may not always be known).

Principal function is association of data.

(12A) RANK of coal - enter anth, bit, subbit, lignite, no coal, unknown, or

multiple. Only the rank names listed above are acceptable.

If "multiple" is used, enter rank from above list in Comment2 column for each coal unit.

(6N) DATE - enter Yr/Mo/Dy: enter 0 for unknown month or day, e.g., 67/04/00.

C - circle "C" for those records to be kept confidential.

(16M) MAP I.D. NO. - the numbering system is arbitrary for the geologist and intended to provide a unique identifier between the stratigraphic sequence data and the point location on the map. The map I.D. number must match those used on the point location map submitted to NCRDS for digitization. Because the data will be retrieved as a main grouping of geologist, State, county, quad, etc., the problem of numeric duplication is minimized, but care should be taken to avoid possible problems.

(7N) SURFACE ELEVATION - "surface" equals ground elevation - NOT coal bed surface or Kelly Bushing of drill rig.

2N) ELVPREC (ELEVATION PRECISION) - use only if surface elevation needs to be qualified. Qualifiers are listed below: ENTER CODE ONLY:

Code	
1	etm ± 10' (etm = estimated from topographic map)
2	etm ± 20'
3	etm ± 50'
4	from driller
5	from Kelly Bushing: enter Kelly Bushing elevation in Comment1 field, e.g. KB 1387, or KB-GL 15 ft.
6	from Kelly Bushing ± 5'
7	from Kelly Bushing ± 10'
8	transit
9	hand level
10	barometer

TOTAL DEPTH LOGGED - enter total depth of section, core, log, etc. being described, in decimal feet or feet and inches. This figure must match the total of the numbers in the THICKNESS column.

(9N) LOCAL STRIKE, DIP & ANGLE - Strike and dip directions will be stored and retrieved as the number of degrees between 1 and 360, clockwise from N: i.e., E = 90°, S = 180°, W = 270°, N = 360°

e.g., N 10° W., 3° SW would be entered as: 350, 260, 3.

APP THK (APPARENT THICKNESS) - circle only if "Local strike/dip/angle" is entered and bed thicknesses have not been corrected. If APPTHK is circled, angle = angle +100° since no actual angle would be over 90°.

(24M) SOURCE - enter source of data, e.g., Peabody Coal Company. If left blank field will assume same entry as "Geologist."

(2N) DESCRIPTION or LOG - circle one. In the space that follows enter code for specifics, e.g. roadcut, gamma log; enter code from following list:

I. Description

Code	
01	roadcut
02	outcrop
03	underground mine
04	surface mine
05	prospect pit
06	measured section
07	mine mouth
08	section from publication

II. Log

Code		Code	
01	core	10	resistivity
02	drill hole	11	spontaneous potential (SP)
03	rotary (chips)	12	sonic
04	drillers log	13	laterolog
05	electric	14	seismic
06	geophysical	15	caliper
07	gamma (natural)	16	coal test
08	density (gamma-gamma)	17	oil and gas
09	neutron (activation)	18	water well
19	soil test		
20	power line hole		
21	pump hole		
22	ventilation shaft		
23	gamma and neutron		
24	gamma and density		
25	rotary and core		

30 multiple: if more than one type of log in vertical sequence, list string of abbreviations in Comment1 field. See also explanation for Unit Qualifier

31 combination: for combination of types for the entire log enter string of abbreviations in Comment1 field

LAT/LONG - enter precise values, e.g., latitude and longitude to nearest second or supply NCRDS with point location map for digitization. See NCRDS manager for details.

(2N) LL/PREC (LATITUDE/LONGITUDE PRECISION) - use only if lat/long coordinates need to be qualified. Qualifiers are: ENTER CODE ONLY

Code	
1	± 100'
2	± 200'
3	± 500'
4	± 1/4 mile
5	± 1/2 mile
6	GT 1/2 mile

(1N) WEATHERING - enter one of the following numeric codes:

Code	
1	fresh
2	slightly weathered
3	weathered
4	highly weathered
5	bloom
6	clinkered
7	other: enter in Comment1
8	multiple: see also explanation for Unit Qualifier.

QTRS 1/2/3/4 SEC/T/R - enter principal meridian code number, township, range, and section reading with quarters, e.g., SE1/4, NE1/4, SW1/4, NE1/4 sec 29, T1N, R68W, PM 06.

40M) COMMENT1 - include drill hole number, mine name, and other items mentioned above.

All of the above information will be associated with each of the following unit sequences

4N) UNIT - NCRDS will enter sequential numbers to identify each unit within the section. On the 8 1/2 X 11 inch form the field has been eliminated to conserve space.

(4A) UNIT QUALIFIER - If applicable, enter from one to four letters from the list below:

A analysis run on sample

B boundary (base or top of group, formation, etc): enter detail in Comment2, e.g., B bs Pennsylvanian

C coal thickness for resource calculation is different than thickness measurement: enter resource thickness in inches in Comment2, e.g., C 238 in

D interbedded: see Primary Lithology and Lithology Modifier enter all interbedded lithologies in Comment2, e.g., D ss sh

E elevation recorded: enter elevation value in Comment2 and indicate top or base of unit, e.g., E bs 7387

F floor rock

G gradational

I incomplete thickness

K coal burned: therefore no thickness measurement

L change in log type: indicate in Comment2, e.g., L top gamma

M estimated thickness

N interlaminated: see Primary Lithology and Lithology Modifier enter all interlaminated lithologies in Comment2, e.g., N ss slst sh

R roof rock

S sample from the unit has been collected

U uncertain: refers to name of bed

W weathering: indicate in Comment2 with weathering code

X bed thickness not to be used for resource calculation: enter details in Comment2, e.g., X 50 ft below Houx Ls (in this case the bed occurrence was extrapolated from a surface marker unit so that the bed thickness and precise elevation are unknown)

THICKNESS - circle one of three measurement values to be used for entire log at top of column; decimal feet, and inches, or inches. Units must be described in continuous sequence from ground surface downward (i.e., from top to bottom). Note: If source data are reported only in increments of depth from the surface, use this column for the "From" and "To" categories and clearly so indicate. Computer programs will calculate the bed thicknesses. Both "Thickness" and "From and To" are stored in the system.

16M) FORMATION - enter Formation name

20M) NAME - enter coal bed, marker bed, or other stratigraphic name if known. In order to retrieve data for specific bed for such manipulation as isopaching or resource calculation, a name must be entered for each unit (record) of that bed. If the bed is uncorrelated but the geologist expects that it will be worked with, a temporary name should be entered.

NCRDS has reserved the names Temp 1, Temp 2, ... Temp (n) for this purpose.

8A) PRIMARY LITHOLOGY - use NCRDS abbreviation list. Enter appropriate abbreviation for lithology. Only one lithology is acceptable for computer entry and storage. If there is no data, enter NR (no record, not logged, no data, not available, core loss). For more than 1 LITH use "D" in UnitQual if applicable.

12M) LITHOLOGY MODIFIER - use NCRDS abbreviation list first for standard modifiers. Where unit is stratigraphically missing, enter NP (not present) in Lithology Modifier, and 0 in Thickness, the name of the missing unit in Name, and its Primary Lithology. e.g., 0 cache coal NP

3M) COLOR - use GSA international standard color abbreviations, if available.

3M) GRAIN SIZE - use Wentworth scale.

3M) GRAIN SHAPE - use NCRDS abbreviation list first.

L2M) MINERALOGY - use NCRDS abbreviation list first.

3A) BEDDING - use NCRDS abbreviation list first.

(1A) CONTACT - enter appropriate letter:

S	sharp
G	gradational
U	undulating
I	irregular
N	unconformable
L	slump
O	other (enter specifics in Comment2 column)

(1A) FOSSILS - enter appropriate letter:

P	plant
I	invertebrate
V	vertebrate
F	fresh water
B	brackish
M	marine
O	other (enter specifics in Comment2 column)

(3A) FJC (FRACTURES/JOINTS/CLEATS) - if applicable, enter one or more of three letters (F, J, and/or C) to indicate presence of condition(s) and describe in Comment2 column. Use the following notation:

cf 73 86S for face strike N 73°E dip 86°S

cb 335 90 for butt strike N 25°W dip 90°

cbsd 345 42E for butt strike N 15°W dip 42°E

cf = cleat face strike and dip

cb = cleat butt strike and dip

Measurements are from 1° to 360° clockwise with E = 90°, S = 180°, W = 270°, N = 360°.

(40M) COMMENT2 - use NCRDS abbreviation list when possible. Forty characters are allowed including spaces; machine will truncate entry at 40 characters.

1/80 U.S.G.S. NATIONAL COAL RESOURCES DATA SYSTEM STRATIGRAPHIC SEQUENCE DATA ENTRY FORMAT (STRAT) PAGE 1 OF 3

GEOLOGIST: COGS - Stewart JE (20) STATE: Colorado (16) COUNTY: Weld (24) PROVINCE: Rocky Mountain (16) REGION: Denver (24)

QUAD NAME & SERIES: Frederick (7.5') (28) COAL FIELD: Boulder-Weld (16) RANK: Subbit (12) DATE: 78/04/17 (yr mo dy) (C)

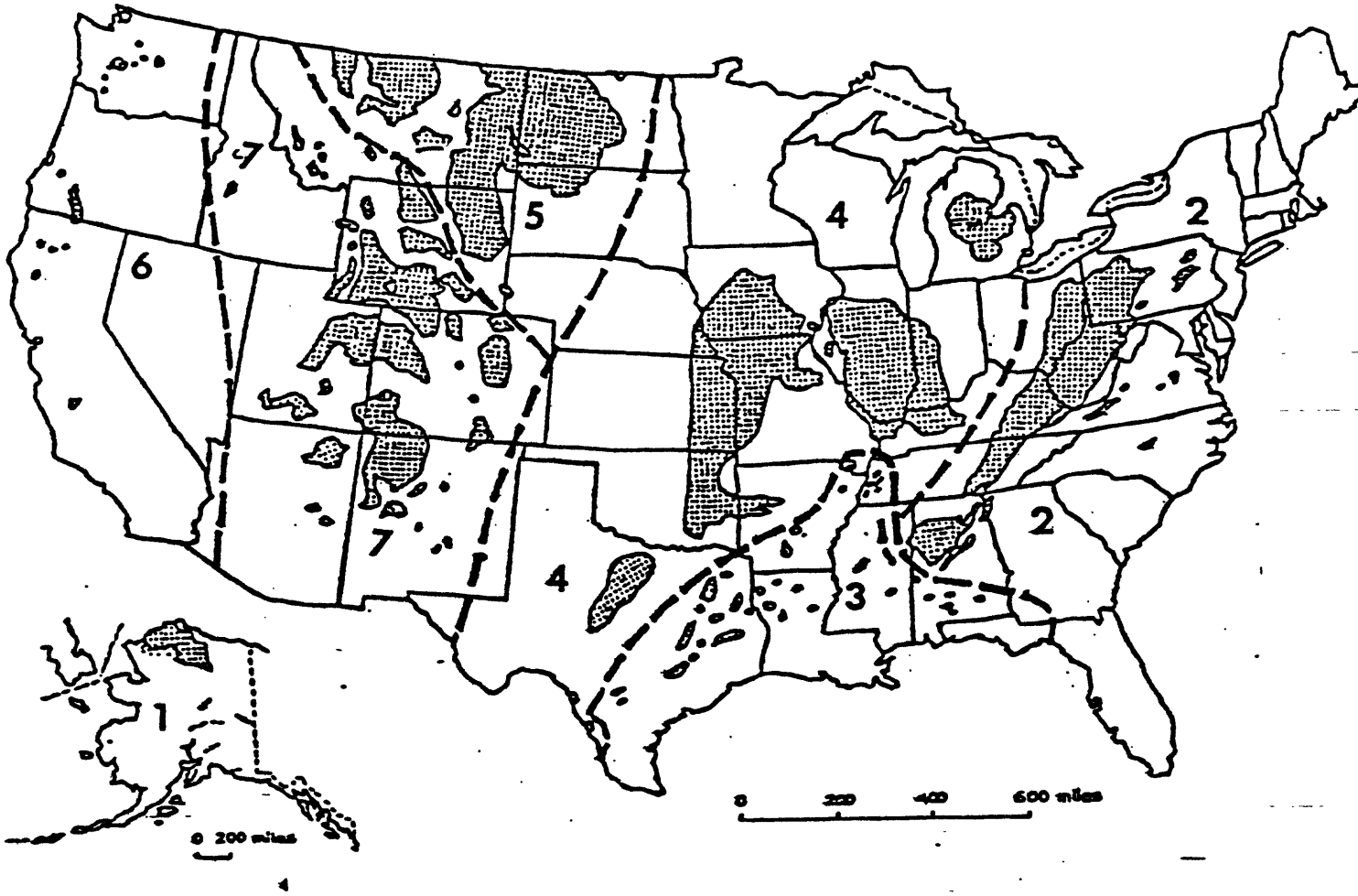
MAP I.D. NO.: FR-1708 (16) SURFACE ELEVATION: 4780 (7) ELVPREC: 1 (2) TOTAL DEPTH LOGGED: 387 LOCAL STRIKE/DIP/ANGLE: N 18° E, 3° SE APP THK

SOURCE: Anderson Coal Company (24) DESCRIPTION: (LOG): 1 (2) LAT/LONG: 45°05'42" / 104°58'23" LL/PREC: (2)

WEATHERING: (1) QTRS 1/2/3/4 sec/T/R: SE ¼ NE ¼ SW ¼ NE ¼ sec 29, T1N, R68W, PM06 COMMENT1: Dh Anderson No 37-28 (40)

UNIT (4)	UNIT QUALIFIER (4)	* THICKNESS (decimal ft) ft in	FORMATION (16)	* NAME (20)	* PRIMARY LITHOLOGY (8)	LITHOLOGY MODIFIER (12)	COLOR (8)	GRAIN SIZE (8)	GRAIN SHAPE (8)	MINERALOGY (12)	BEDDING (8)	CONTACT (1)	FOSSILS (1)	FRACTURES/ JOINTS/ CLEATS (3)	COMMENT2 (40)
		11.0	Laramie		soil										
		14.0			sh										
		42.0			ss	silty									
	S	1.0			sh								P		
	AR	3.0			ss		gy	vfgr	ang	50% qtz	xbd	g			JS-101
		5.0		Laramie No 3	coal										
		.8		Laramie No 3	sh										
		6.2		Laramie No 3	coal										
		2.0		Laramie No 3	sh	carb									
	A	15.0		Laramie No 3	coal										JS-102
		6.0			sh										
		19.0			ss										

Figure 1 - Sample completed stratigraphic sequence (STRAT) form

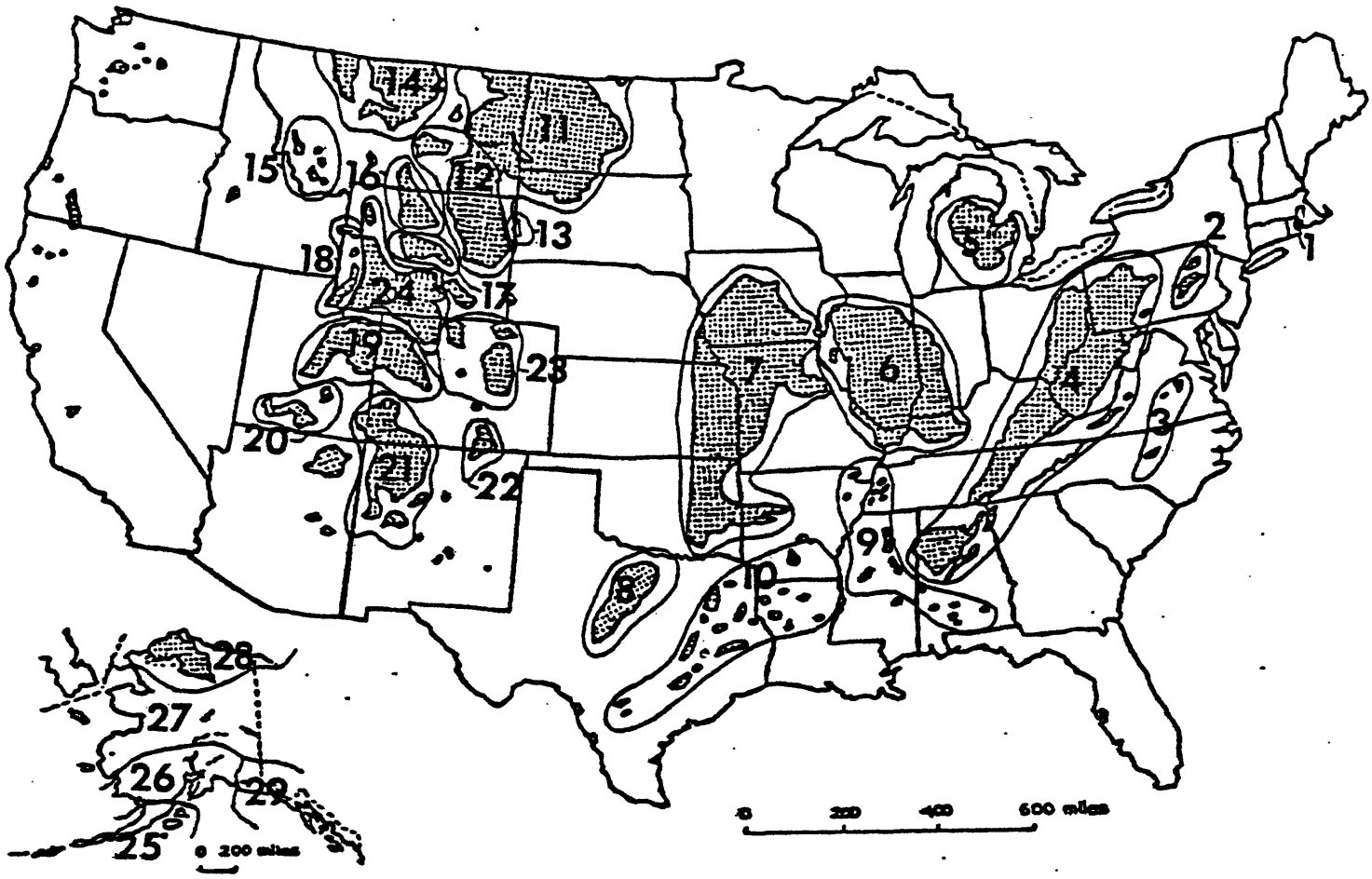


EXPLANATION

Provinces

1. Alaska
2. Eastern
3. Gulf
4. Interior
5. Northern Great Plains
6. Pacific Coast
7. Rocky Mountain

Figure 2. - Coal provinces of the conterminous United States and Alaska.



EXPLANATION
Regions

1. Rhode Island meta-anthracite
2. Pennsylvania anthracite
3. Atlantic coast
4. Appalachian
5. Northern
6. Eastern
7. Western
8. Southwestern
9. Mississippi
10. Texas
11. Fort Union
12. Powder River
13. Black Hills
14. North Central
15. Tertiary lake beds
16. Bighorn Basin
17. Wind River
18. Hams Fork
19. Uinta
20. Southwestern Utah
21. San Juan River
22. Raton Mesa
23. Denver
24. Green River
25. Alaska Peninsula
26. Cook Inlet - Susitna
27. Central Alaska
28. Northern Alaska
29. Southeastern Alaska

Figure 3. - Coal regions of the conterminous United States and Alaska.