

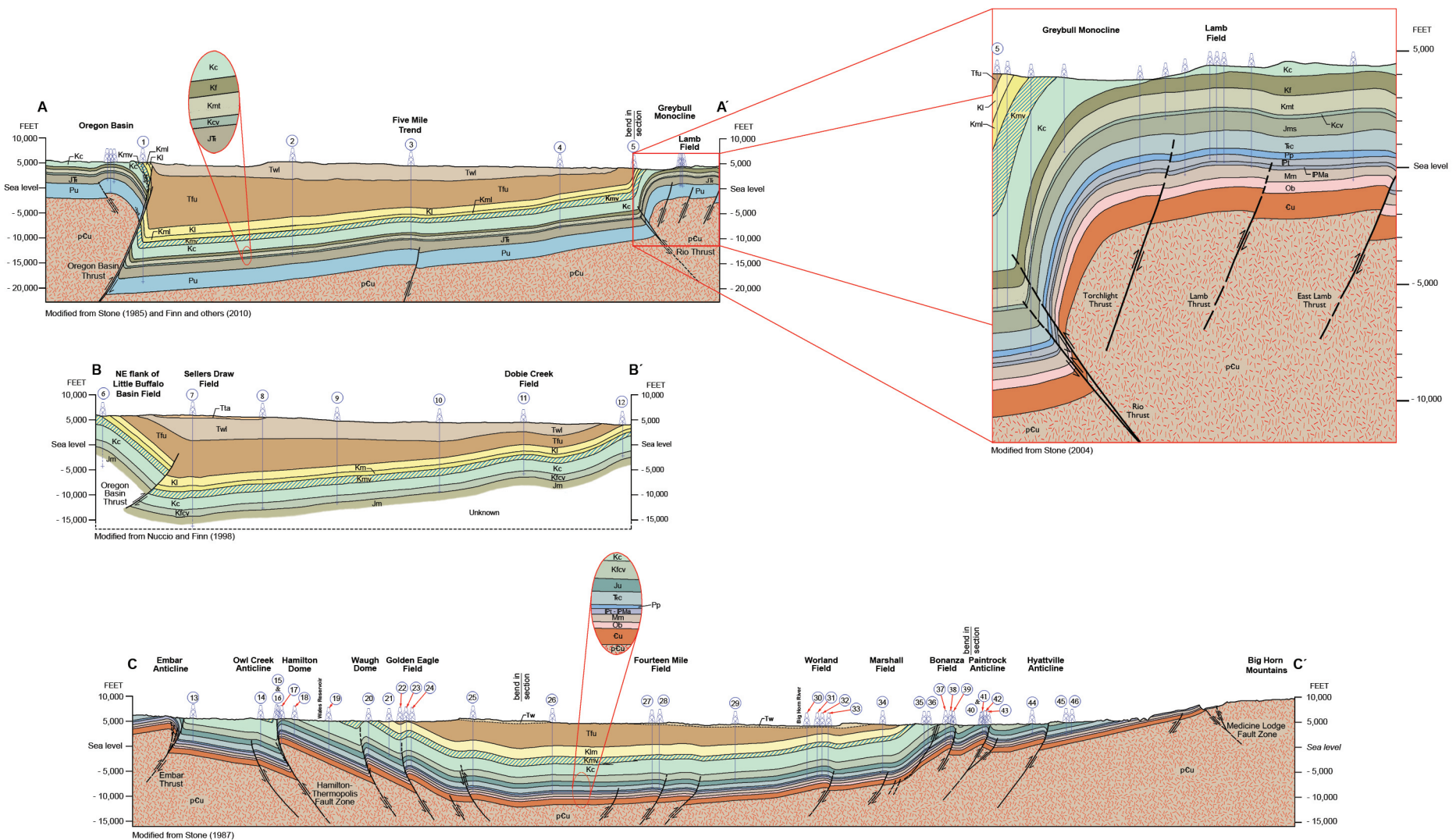


GEOLOGIC CROSS SECTIONS, BIGHORN BASIN, WYOMING

Vertical exaggeration ~ 2x



Geology - Interpreting the past - providing for the future



EXPLANATION

CROSS SECTION SYMBOLS

- Formation contact
- Fault — Dashed where inferred; arrows indicate relative movement
- Drill hole — Well logs used to construct cross sections

GEOLOGIC UNITS

CENOZOIC

- Tertiary**
 - Tw Wasatch Formation
 - Tta Tatman Formation
 - Twl Willwood Formation
 - Ttu Fort Union Formation

MESOZOIC

- Cretaceous**
 - Kl Lance Formation
 - Klm Lance and Meeteetse Formations
 - Km Meeteetse Formation
 - Kml Meeteetse Formation and Lewis Shale
 - Kmv Mesaverde Formation
 - Kc Cody Shale
 - Klcv Frontier Formation, Mowry Shale, Muddy Sandstone, Thermopolis Shale, and Cloverly Formation
 - Kf Frontier Formation
 - km Mowry Shale, Muddy Sandstone, and Thermopolis Shale
 - Kcv Cloverly Formation

JURASSIC

- Jm Morrison Formation
- Jn Morrison, Sundance, and Gypsum Spring Formations
- Ju Jurassic rocks, undifferentiated

JURASSIC AND TRIASSIC

- Jt Morrison, Sundance, Gypsum Spring, and Chugwater Formations

TRIASSIC

- tc Chugwater Formation

PALEOZOIC

Permian

- Pp Phosphoria Formation
- Pu Paleozoic rocks, undifferentiated

Pennsylvanian

- Pt Tensleep Sandstone

Pennsylvanian and Mississippian

- PMa Amsden Formation

Mississippian

- Mm Madison Limestone

Ordovician

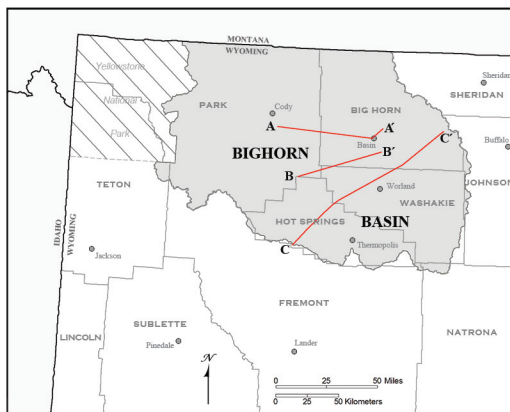
- Ob Bighorn Dolomite

Cambrian

- Cu Cambrian rocks, undifferentiated

PRECAMBRIAN

- pCu Precambrian rocks, undifferentiated



CROSS SECTION LOCATION MAP

REFERENCES

- Finn, T.M., Kirschbaum, M.A., Roberts, S.B., Condon, S.M., Roberts, L.N.R., and Johnson, R.C., 2010. Cretaceous-Tertiary composite total petroleum system (503402), Bighorn Basin, Wyoming and Montana, in U.S. Geological Survey Bighorn Basin Province Assessment Team, comp., Petroleum systems and geologic assessment of oil and gas in the Bighorn Basin Province, Wyoming and Montana: U.S. Geological Survey Digital Data Series DDS-69-V, chap. 3, 156 p.
- Nuccio, V.F., and Finn, T.M., 1998. Thermal maturity and petroleum generation history of Cretaceous and Tertiary source rocks, Bighorn Basin, Wyoming and Montana, in Keefer, W.R., and Goolsby, J.E., eds., Cretaceous and Lower Tertiary rocks of the Bighorn Basin, Wyoming and Montana: Casper, Wyo., Wyoming Geological Association, 49th annual field conference, Guidebook, p. 211-231.
- Stone, D.S., 1985. Geologic interpretation of seismic profiles, Bighorn Basin, Wyoming, part II—West flank, in Gries, R.R., and Dyer, R.C., eds., Seismic exploration of the Rocky Mountain region: Rocky Mountain Association of Geologists and Denver Geophysical Society, p. 175-186.
- Stone, D.S., 1987. Rocky Mountain Transect—Wyoming, transect segments SW 2, SW 1, NE 1, NE 2: Littleton, Co., DVD, version 2.0.
- Stone, D.S., 2004. Rio thrusting, multi-stage migration, and formation of vertically segregated Paleozoic oil pools at Torchlight Field on the Greybull Platform (eastern Bighorn Basin)—Implications for exploration: The Mountain Geologist, v. 41, no. 3, p. 119-138.

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Layout and design by James R. Rodgers and Phyllis A. Ranz
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WELL CONTROL ALONG CROSS SECTIONS

Well no.	API no.	Operator	Well name	Bottom formation	Surface location sec. T. R.	County	Spud year
1	49-029-21009	Hunt Energy Corporation	Lock Katrine Unit 1	Madison	2 51 N 100 W	Park	1982
2	49-029-21064	Gary-Williams Production Company	Emblem Beach 1R	Morrison	2 51 N 98 W	Park	1991
3	49-003-20379	Eastern Minerals Corporation	Michaels Ranch Fee 17-15	Tensleep	17 51 N 96 W	Big Horn	1996
4	49-003-20597	BP America Production Company	Adams 1	Morrison	17 51 N 94 W	Big Horn	1981
5	49-003-20124	True Oil LLC	Rio Unit 33-20	Fuson	20 51 N 93 W	Big Horn	1969
6	49-029-20601	Gulf Energy Corporation	Buffalo Creek-Fed 1	Tensleep	32 48 N 99 W	Park	1976
7	49-029-20489	Bill Barrett Corporation	Sellers Draw Unit II 1	Phosphoria	21 48 N 99 W	Park	1976
8	49-043-20380	American Beryllium Oil Corp.	Ridge Unit 1-21	Dakota	21 48 N 97 W	Washakie	1978
9	49-003-20574	Devon Energy Production Company LP	Tatman Mtn. W-6980 1-20	Morrison	20 49 N 96 W	Big Horn	1981
10	49-003-20469	Southern Mineral Corporation	Schuster Flats 13555 26-1	Dakota	26 49 N 95 W	Big Horn	1978
11	49-003-20466	Devon Energy Production Company LP	Dobie Creek W-14076 1-11	Skull Creek	11 49 N 94 W	Big Horn	1978
12	49-003-05250	Stanolind Oil & Gas Company	Sykes Mobley 1	Muddy	25 50 N 93 W	Big Horn	1955
13	49-017-05354	Wyo. Oil & Minerals Inc.	Daniels 1	Embar	32 9 N 2 E	Hot Springs	1954
14	49-017-06691	Dunoco Inc.	USA 1	Tensleep	26 44 N 98 W	Hot Springs	1966
15	49-017-05582	Merit Energy Company	Kennedy Govt 2	Amsden	23 44 N 98 W	Hot Springs	1963
16	49-017-05582*	Merit Energy Company	Kennedy Govt 2	Amsden	23 44 N 98 W	Hot Springs	1964
17	49-017-05808	Merit Energy Company	Unit C-410400 51	Flathead	14 44 N 98 W	Hot Springs	1953
18	49-017-05812	Merit Energy Company	Placer C-044140 86	Tensleep	13 44 N 98 W	Hot Springs	1959
19	49-017-05929	Husky Oil Company	Cottonwood Land Co 1	Tensleep	26 45 N 98 W	Hot Springs	1954
20	49-017-05924	Ajax Oil Company	Loeb 1	Tensleep	27 45 N 97 W	Hot Springs	1951
21	49-017-20218	Fulton Producing Company	Cottonwood Land Co 31-23	Dakota	23 45 N 97 W	Hot Springs	1975
22	49-017-06631	Husky Oil Company	Cottonwood Land 1	Phosphoria	14 45 N 97 W	Hot Springs	1952
23	49-017-05951	Saga Petroleum LLC of Colorado	Golden Eagle Unit 1	Tensleep	12 45 N 97 W	Hot Springs	1948
24	49-017-05959	Saga Petroleum LLC of Colorado	Golden Eagle Unit 10	Phosphoria	12 45 N 97 W	Hot Springs	1955
25	49-043-05138	Phillips Petroleum Company	Mesa A W-010296 1	Madison	27 46 N 96 W	Washakie	1956
26	49-043-20270	Teneco Oil Company	Winchester W-0325048 1	Tensleep	22 46 N 95 W	Washakie	1975
27	49-043-20422	Natural Gas Processing Company	Federal 3-35	Phosphoria	35 47 N 94 W	Washakie	1996
28	49-043-05081	Gulf Energy Corporation	Butler 1	Phosphoria	35 47 N 94 W	Washakie	1953
29	49-043-20429	Davis Oil Company	Okaloosa-Federal 1	Morrison	10 47 N 93 W	Washakie	1980
30	49-043-05006	Devon Energy Production Company LP	Unit Patent 27-5	Embar	29 48 N 92 W	Washakie	1950
31	49-043-05428	Devon Energy Production Company LP	Worland Unit 24-F2	Phosphoria	29 48 N 92 W	Washakie	1996
32	49-043-05434	Devon Energy Production Company LP	Unit Franks Patent 7-F3	Embar	21 48 N 92 W	Washakie	1948
33	49-043-05701	Devon Energy Production Company LP	Worland Unit 12-F2	Embar	21 48 N 92 W	Washakie	1948
34	49-043-20371	Altus Exploration Company	North Marshall-Govt 7-1	Phosphoria	7 48 N 92 W	Washakie	1978
35	49-003-05057	Cater Oil Company	Hanover 1X	Phosphoria	34 48 N 91 W	Big Horn	1957
36	49-003-05100	Amerada Hess Corporation	Neal B-0224083 1	Phosphoria	28 49 N 91 W	Big Horn	1963
37	49-003-05083	Gulf Energy Corporation	Mayon B-0368644A 1	Madison	35 49 N 91 W	Big Horn	1951
38	49-003-05085	Conoco Inc.	Federal B-044043 7	Gros Ventre	25 49 N 91 W	Big Horn	1959
39	49-003-05111	General American Oil Co. of Texas	Federal W-03511 6	Tensleep	26 49 N 91 W	Big Horn	1952
40	49-003-05000	Christiana Oil Corp.	Federal 1	Tensleep	18 49 N 90 W	Big Horn	1953
41	49-003-20502	Husky Oil Company	Paintrock #58309 10-12	Granite	12 49 N 91 W	Big Horn	1979
42	49-003-05002	Christmann John J.	Govt. 1	Tensleep	18 49 N 90 W	Big Horn	1963
43	49-003-05165	Christmann John J.	—	Tensleep	18 49 N 90 W	Big Horn	1963
44	49-003-05235	Mobil Expl. & Producing North America Inc.	Mercer Patented 1	Tensleep	2 49 N 90 W	Big Horn	1953
45	49-003-20683	Data Big Horn Basin	Mineral 23X-25	Madison	25 50 N 90 W	Big Horn	1983
46	49-003-20729	Data Big Horn Basin	Hoya 43X-25	Amsden	25 50 N 90 W	Big Horn	1984

* Sidetrack well

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