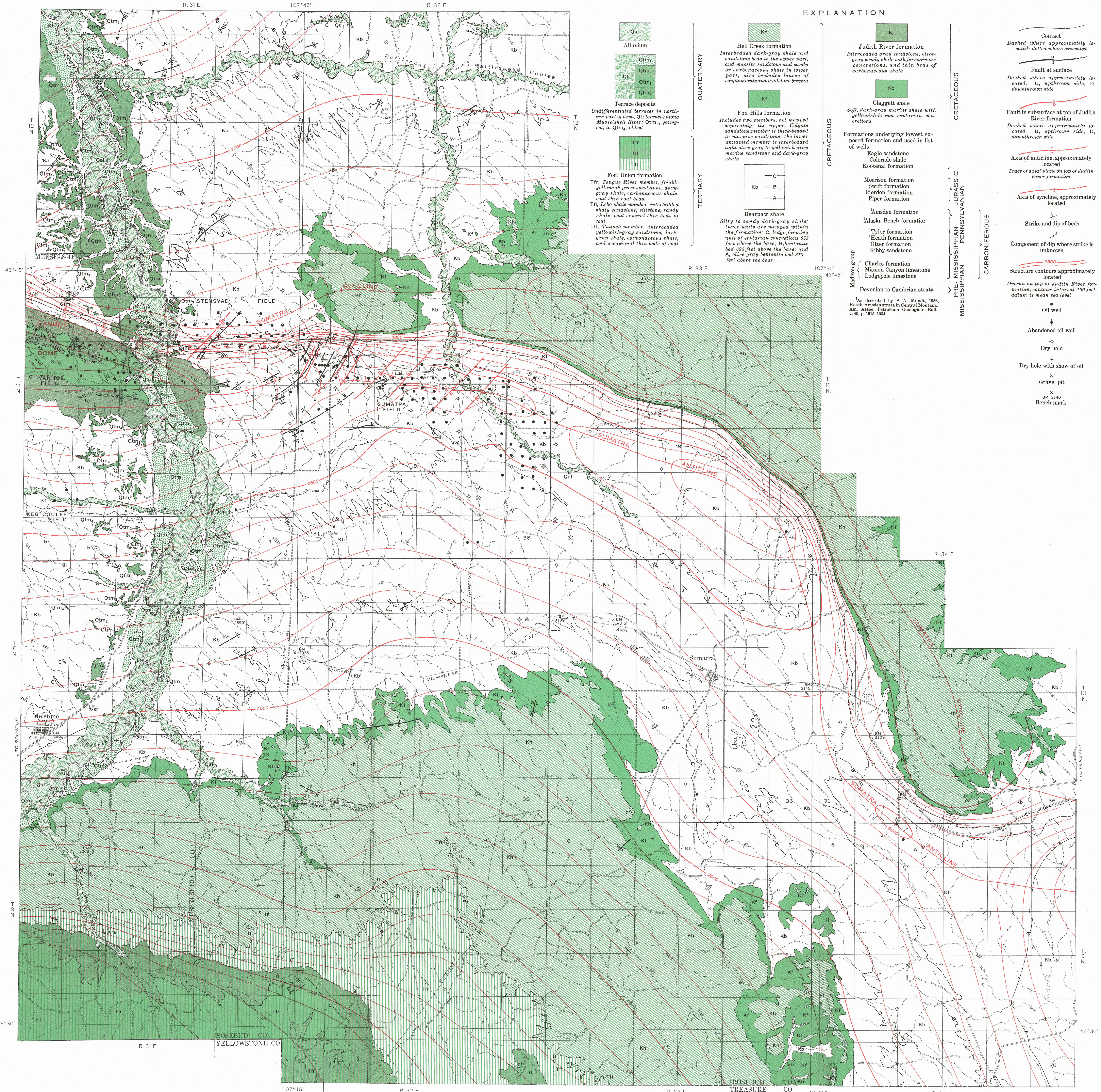


Base map compiled from aerial photographs and General Land Office township plats

Geology mapped by H. R. Smith, assisted by F. L. Doyle, 1955, and J. F. Treckman, 1956

EXPLANATION

QUATERNARY

Qal — Alluvium

Qt; Qtm₁–Qtm₄ — Terrace deposits
Undifferentiated terraces in northern part of area, Qt; terraces along Musselshell River: Qtm_1, youngest, to Qtm_4, oldest

TERTIARY

Tfr, Tfl, Tft — Fort Union formation
Tfr, *Tongue River member, friable yellowish-gray sandstone, dark-gray shale, carbonaceous shale, and thin coal beds.*
Tfl, *Lebo shale member, interbedded shaly sandstone, siltstone, sandy shale, and several thin beds of coal.*
Tft, *Tullock member, interbedded yellowish-gray sandstone, dark-gray shale, carbonaceous shale, and occasional thin beds of coal*

CRETACEOUS

Kh — Hell Creek formation
Interbedded dark-gray shale and sandstone beds in the upper part, and massive sandstone and sandy or carbonaceous shale in lower part; also includes lenses of conglomerate and mudstone breccia

Kf — Fox Hills formation
Includes two members, not mapped separately; the upper, Colgate sandstone member is thick-bedded to massive sandstone; the lower unnamed member is interbedded light olive-gray to yellowish-gray marine sandstone and dark-gray shale

Kb (C, B, A) — Bearpaw shale
Silty to sandy dark-gray shale; three units are mapped within the formation: C, ledge-forming unit of septarian concretions 955 feet above the base; B, bentonite bed 695 feet above the base; and A, olive-gray bentonite bed 370 feet above the base

Kj — Judith River formation
Interbedded gray sandstone, olive-gray sandy shale with ferruginous concretions, and thin beds of carbonaceous shale

Kc — Claggett shale
Soft, dark-gray marine shale with yellowish-brown septarian concretions

Formations underlying lowest exposed formation and used in list of wells

CRETACEOUS: Eagle sandstone; Colorado shale; Kootenai formation

JURASSIC: Morrison formation; Swift formation; Rierdon formation; Piper formation

PENNSYLVANIAN: [1]Amsden formation; [1]Alaska Bench formation

MISSISSIPPIAN (CARBONIFEROUS): [1]Tyler formation; [1]Heath formation; Otter formation; Kibby sandstone; Madison group: Charles formation, Mission Canyon limestone, Lodgepole limestone

PRE-MISSISSIPPIAN: Devonian to Cambrian strata

[1]As described by P. A. Mundt, 1956, Heath-Amsden strata in Central Montana: Am. Assoc. Petroleum Geologists Bull., v. 40, p. 1915-1934.

Contact
Dashed where approximately located; dotted where concealed

Fault at surface (D / U)
Dashed where approximately located. U, upthrown side; D, downthrown side

Fault in subsurface at top of Judith River formation
Dashed where approximately located. U, upthrown side; D, downthrown side

Axis of anticline, approximately located
Trace of axial plane on top of Judith River formation

Axis of syncline, approximately located

Strike and dip of beds

Component of dip where strike is unknown

Structure contours approximately located (2500)
Drawn on top of Judith River formation, contour interval 100 feet, datum is mean sea level

Oil well

Abandoned oil well

Dry hole

Dry hole with show of oil

Gravel pit

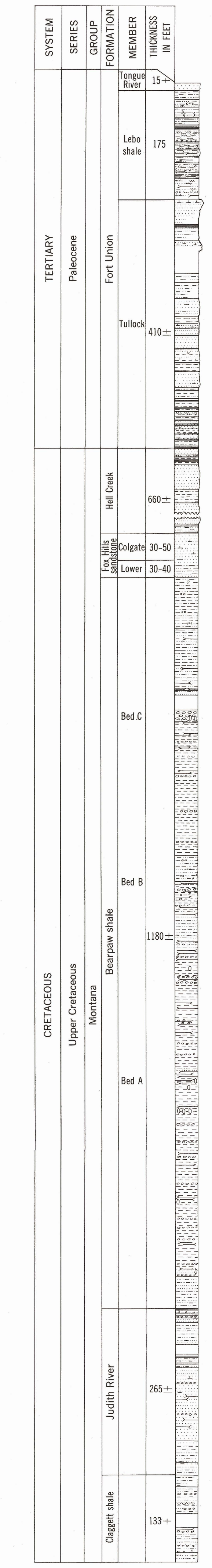
BM 3140 — Bench mark

SELECTED LIST OF WELLS DRILLED TO APRIL 15, 1961

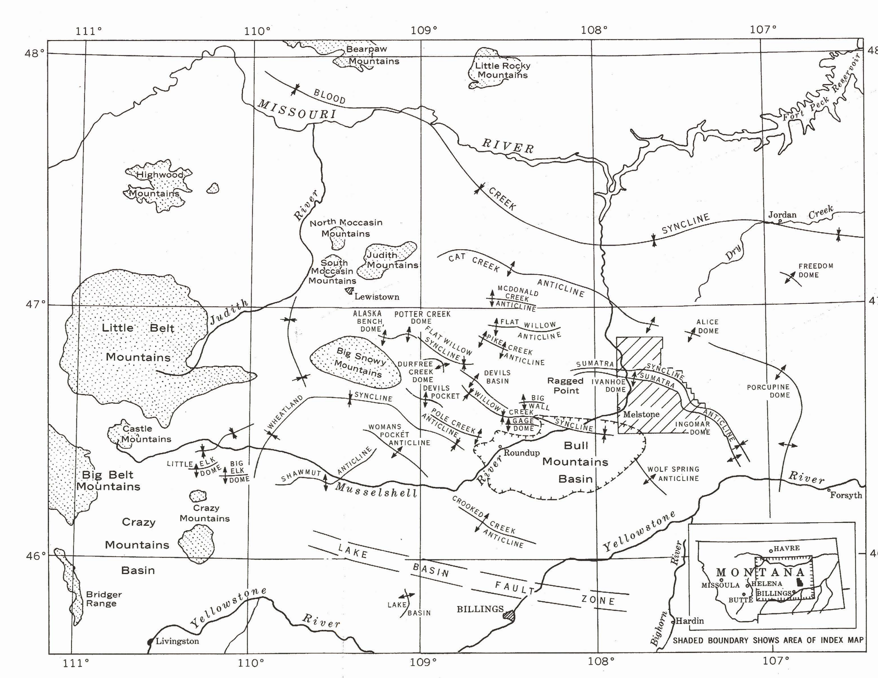
[IDP, initial daily production; BOPD, barrels of oil per day; 32°API, 32° oil Am. Petroleum Inst. gravity]

Operator, lease, and well No.	Ground elevation (feet)	Location (section)	Drilling ceased	Total depth (feet)	Lowest formation reached	Remarks
T. 9 N., R. 31 E.						
Continental Oil Co., State of Montana 1	3185	NW¼NE¼ 16	1959	5990	Otter	Dry.
T. 9 N., R. 32 E.						
Miles Jackson, Whalen 1	3164	NE¼NE¼ 6	1961	5800	Otter	Dry.
Amerada Petroleum Corp., A. M. Hougen "A" 1	3370	W½NW¼SW¼ 17	1951	6575	Charles	Do.
Miles Jackson, Inc., Guthridge 1	3378	C SE¼SE¼ 23	1958	6260	Otter	Do.
T. 9 N., R. 33 E.						
True Oil Co., Messer 1	3161	SE¼NW¼ 4	1961	5340	Amsden	Dry; oil and gas show from Amsden, 5044-5074.
T. 9 N., R. 34 E.						
Juniper Oil & Mining Co., Magelssen 1	2971	C SE¼NW¼ 4	1959	4830	Heath	32 BOPD.
Juniper Oil & Mining Co., Magelssen 2	2947	C NE¼SW¼ 4	1960	4500	Amsden	Dry.
The Texas Co., Northern Pacific RR. "E" 1	2980	NE¼NE¼NE¼ 5	1949	6006	Madison group	98 BOPD from Tyler, 4385-4415; discovery.
T. 10 N., R. 31 E.						
C. T. McLaughlin, Boyd Kincheloe 1	2887	C NW¼NW¼ 1	1960	4902	Otter	Dry.
American Climax-Barker, Smith-Kincheloe 1	2828	C SW¼NW¼ 3	1959	4852	----do----	Do.
Miles Jackson-H. L. Baker, Butts 1	2923	C SW¼SW¼ 9	1961	5051	----do----	Do.
C. T. McLaughlin, Schroeder 1	2913	SW¼SW¼ 23	1960	5290	----do----	Do.
Miles Jackson, Grebe 1	2854	C NW¼NW¼ 28	1961	5219	----do----	Do.
T. 10 N., R. 32 E.						
Continental Oil Co., Roberts 1	3096	NE¼NW¼ 2	1961	5030	Heath	Dry.
Juniper Oil & Mining Co., Hank 1	3062	C NE¼NE¼ 3	1960	5120	----do----	Do.
Hibbard Oil Co., 1	--------	W½SE¼NW¼ 12	1921	800	-------------	Do.
K. D. Owen, D. W. Rasque 1	3077	C SE¼SW¼ 14	1953	6039	Kibbey	Do.
Continental Oil Co., Northern Pacific RR. 1	3298	NW¼SE¼NW¼ 29	1956	7830	Cambrian and Ordovician rocks.	Do.
Pure Oil Co., Chas. Hopf 1	3379	C SE¼NW¼ 35	1956	5961	Otter	Do.
T. 10 N., R. 33 E.						
Miles Jackson, Batts-Burton 1	3161	C NW¼NW¼ 6	1959	5225	Van Duzen sand*	Dry.
The Texas Co., A. M. Lerberg Estate 1	3283	SW¼NE¼NE¼ 11	1955	5090	Heath	Do.
J. L. Gulley, Jr., et al., L. C. Howard & J. Nerbovig 1	3196	C SE¼SW¼ 14	1959	5202	----do----	Do.
Chicago, Milwaukee, & St. Paul Ry., 1	3035	--------- 15	1915	2000	Colorado shale	Do.
Northern Pump Co., Lloyd Welch 1	3159	C SE¼SE¼ 25	1952	5108	Heath	Do.
Sinclair Oil & Gas Co., V. E. Kesterson 1	3091	C SE¼NW¼ 34	1960	5240	----do----	240 BOPD from Amsden, 4815-4826, 35°API; discovery.
Sinclair Oil & Gas Co., V. E. Kesterson 2	3085	C NW¼SE¼ 34	1960	5140	----do----	Dry.
Sinclair Oil & Gas Co., V. E. Kesterson 3	3124	C NW¼NW¼ 34	1960	5029	Alaska Bench	Do.
True Oil Co., Kesterson 1	2986	C SW¼SW¼ 34	1961	5045	----do----	Do.
T. 10 N., R. 34 E.						
Juniper Oil & Mining Co., State 1	3090	C NW¼NW¼ 32	1960	4670	Amsden	Dry.
The Texas Co., State of Montana M-4616-1	2984	SE¼SE¼SE¼ 32	1950	4435	Tyler	26 BOPD from Tyler.
T. 11 N., R. 31 E.						
B. J. Taylor, Northern Pacific RR. 1	2917	C SW¼SE¼ 1	1960	5540	Heath	Dry; oil show from Amsden, 3580-3590.
True Oil Co., Minnie 1	2719	SE¼SE¼ 4	1960	5367	----do----	Dry.
Farmers Union Central Exchange Inc., Thomson 1	3048	SW¼SW¼SW¼ 7	1952	5035	Kibbey	Do.
Minnesota-Flatwillow Petroleum Co., H. Maxwell 1	3027	SE¼SW¼SW¼ 7	1932	3100	Kootenai	Do.
McAlester Fuel Co., Montana Federal "B" 1	2896	NW¼NE¼ 8	1959	5544	Otter	Do.
Continental Oil Co., Stensvad 5	2945	SW¼SW¼SW¼ 8	1960	4335	Heath	Do.
Continental Oil Co., Stensvad 6	2732	SE¼SW¼ 9	1960	5443	Otter	Do.
Continental Oil Co., Stensvad 7	2756	SE¼NW¼ 9	1961	5270	Heath	Do.
McAlester Fuel Co., Montana-Federal "A" 8	2831	SW¼SE¼ 10	1959	5510	----do----	Dry.
Honolulu Oil Corp., Stensvad 11-8	2925	C SE¼NE¼ 11	1959	5560	----do----	Dry; oil show from Tyler, 5416-5427, 5426-5447.
Honolulu Oil Corp., Stensvad 11-9	2865	NW¼NE¼SE¼ 11	1958	5516	----do----	448 BOPD from Tyler; Stensvad field discovery.
Honolulu Oil Corp., Stensvad 11-13	2877	SW¼SW¼ 11	1959	5504	----do----	Dry.
Pan American Petroleum Corp., A. S. Getchell 4	2993	NW¼SE¼ 12	1959	5633	----do----	Do.
McAlester Fuel Co., O. Semingson 1	2972	NE¼NE¼SE¼ 13	1953	4834	Tyler	Do.
R. P. Oliver, Klamath-Stensvad "A" 1	2284	C SE¼SE¼ 14	1957	4721	Heath	Do.
Vaughey & Vaughey, Oliver Torgeson 1	2897	NE¼NW¼ 14	1959	5445	----do----	Do.
Flank Oil Co., Stensvad 1	2824	SW¼NW¼SW¼ 15	1954	5094	Kibbey	Do.
McAlester Fuel Co.-Sumatra, Stensvad "A" 1	2866	NW¼NE¼ 15	1960	5542	Heath	Do.
R. P. Oliver, Klamath-Stensvad "B" 1	2891	C SE¼SE¼ 15	1957	4560	----do----	Do.
R. P. Oliver, State of Montana 1	2811	SW¼SW¼NW¼ 16	1955	4050	----do----	Dry; oil shows from Kootenai and Tyler, 2544-2562 and 3413-3431.
R. P. Oliver, State of Montana 2	2799	NW¼SE¼SE¼ 16	1955	4258	----do----	Dry.
R. P. Oliver, State of Montana 3	2817	C SW¼SW¼ 16	1951	4086	----do----	235 BOPD from Tyler and Heath, 3964-3978; discovery.
R. P. Oliver, State of Montana 8	2736	NE¼NE¼NE¼ 16	1959	5335	----do----	Dry.
R. P. Oliver, State of Montana 9	2742	NW¼NE¼ 16	1960	5345	----do----	Dry; oil show from Amsden, 4881-4918.
Chicago Corp.-Republic Natural Gas Co., Northern Pacific RR. 1.	2909	SW¼SE¼NE¼ 17	1953	5208	Charles	92 BOPD from Morrison, 35.0°API; Morrison discovery.
Chicago Corp.-Republic Natural Gas Co., Northern Pacific RR. 2.	2974	NE¼NW¼SE¼ 17	1953	2895	Morrison	Dry; oil show from Morrison.
Chicago Corp.-Republic Natural Gas Co., Northern Pacific RR. 5.	2809	SE¼SW¼SE¼ 17	1956	4151	Amsden-Heath	Dry.
Chicago Corp.-Republic Natural Gas Co., Northern Pacific RR. 8.	2864	SW¼NW¼SE¼ 17	1956	4146	----do----	Do.
Chicago Corp.-Republic Natural Gas Co., Northern Pacific RR. 9.	2868	NW¼SW¼SW¼ 17	1956	4212	Heath	Dry; oil show from Tyler, 4050-4089.
Champlin Oil & Refining Co.-Republic Natural Gas Co., Northern Pacific RR. 10.	2901	NW¼NW¼SW¼ 17	1957	4190	----do----	Dry.
Winston L. Cox, Northern Pacific RR. 1	3014	SE¼NW¼ 17	1960	4209	----do----	277 BOPD from Amsden, 3493-3516, 31.9°API; discovery.
Cardinal Petroleum Co., Northern Pacific "A" 1	2842	SW¼SE¼ 17	1960	4221	----do----	Dry.
Juniper Oil & Mining Co., Northern Pacific 2	2896	NW¼NE¼ 17	1960	4265	----do----	Do.
Sumatra Oil Co., Northern Pacific 1	2905	NW¼SW¼ 17	1960	4214	----do----	Dry; gas show from Piper and Amsden, 3450-3529.
Amerada Petroleum Corp., Government-Cox 1	2967	NW¼SW¼SW¼ 18	1957	4615	Otter	Dry.
Champlin Oil & Refining Co.-Republic Natural Gas Co., Government-Amerada-Cox 1.	2909	NE¼SE¼SW¼ 18	1958	4283	Heath	Do.
Champlin Oil & Refining Co., Amerada-Cox 2	2940	NE¼SE¼NW¼ 18	1959	4220	----do----	Do.
Chicago Corp.-Republic Natural Gas Co.-Amerada Petroleum Corp., Government 1.	3006	NE¼NE¼NE¼ 18	1953	2984	Morrison	Dry; oil show from Morrison.
Cardinal Petroleum Co., Montana Valley Land Co. 1	3039	SW¼NE¼ 19	1960	4550	Heath	Dry.
Continental Oil Co.-American Climax Petroleum, Government 20-12.	2938	NW¼SW¼ 20	1960	4557	----do----	Do.
Gulf Oil Corp., Eileen De Jaegher 2	2794	NE¼NE¼NW¼ 21	1957	4175	----do----	Do.
Klamath Oil, Inc., Otto Stensvad 1	2813	NE¼NE¼NE¼ 21	1949	6011	Madison group	Do.
Texaco, Inc., Haddow 1	2970	NE¼SE¼ 24	1959	4800	Heath	Do.
Texaco, Inc., Haddow 2	2939	SE¼SE¼ 24	1960	4700	----do----	Do.
Texaco, Inc., Johnson 1	3004	SW¼NE¼ 24	1960	4780	Van Duzen sand*	Do.
L. Barker, Government-Wheatley 1	2834	NW¼NW¼ 26	1959	4563	----do----	Do.
Gulf Oil Corp., Eileen De Jaegher 1	2899	SE¼NW¼ 28	1960	4500	Heath	Do.
American Climax-L. Barker, Ostreim 1	3009	C NW¼NW¼ 30	1960	4750	Van Duzen sand*	Do.
Continental Oil Co.-American Climax Petroleum-L. Barker, Jr., De Jaegher 1.	2908	C SE¼NE¼ 31	1960	4635	Heath	177 BOPD from Tyler, 4302-4316, 33.6°API; discovery.
Continental Oil Co.-American Climax Petroleum-L. Barker, Jr., De Jaegher 31-2.	2939	NW¼NE¼ 31	1960	4640	----do----	Dry.
American Climax Petroleum-L. Barker, Jr., De Jaegher 31-6	2906	SE¼NE¼ 31	1961	4625	----do----	Do.
L. Barker, Jr.-American Climax Petroleum-Continental Oil Co., De Jaegher 31-14.	2921	SE¼SW¼ 31	1961	4775	----do----	Do.
American Climax Petroleum-L. Barker, Jr.-Continental Oil Co., Government 32-12 1.	2885	NW¼SW¼ 32	1960	4640	----do----	100 BOPD from Tyler, 4512-4521, 33°API.
T. 11 N., R. 32 E.						
Chambers & Kennedy, Northern Pacific RR. 1	3026	C SW¼SW¼ 3	1959	5746	Heath	Dry.
Pennant Drilling Co., Inc., Northern Pacific RR.-Forney 1	3050	C SE¼SE¼ 3	1953	5740	Amsden-Heath	Do.
British American Oil Producing Co., R. M. King 1	3089	5940 ft N. of S. line, 660 ft E. of W. line, 4.	1960	5732	Heath	Do.
Tenison Drilling Co., Inc., Grebe 1	3103	SW¼SW¼SW¼ 5	1957	5900	Otter	Do.
L. Barker, Jr., Government-Brown 1	3016	516 ft N. of S. line, 534 ft E. of W. line, 6.	1960	5716	Heath	194 BOPD from Tyler, 5530, 33°API.
McAlester Fuel Co., Northern Pacific RR. 1	2862	C NW¼NW¼ 7	1953	4974	Amsden-Heath	Dry; oil show from Tyler, 4060-4085.
McAlester Fuel Co., Northern Pacific RR. 7	2967	NE¼NE¼SW¼ 7	1955	4675	Tyler	83 BOPD from Piper, 29.2°API; Piper discovery.
McAlester Fuel Co., Northern Pacific RR. 9	2996	NW¼SW¼SE¼ 7	1955	4640	Amsden-Heath	Dry.
Continental Oil Co., A. Kincheloe "A" 8	3018	C NE¼SE¼ 8	1955	4858	----do----	Do.
The Texas Co., R. M. King 9	3023	C SW¼NW¼ 8	1955	4780	Heath	Do.
The Texas Co., R. M. King 4	3018	C NE¼SE¼ 9	1954	4895	Amsden-Heath	Do.
The Texas Co., J. A. Choate Estate 3	2992	C SW¼NE¼ 10	1955	5015	Heath	Do.
The Texas Co., Northern Pacific RR. "E" (NCT-3) 4	3015	SE¼SE¼SE¼ 11	1959	4975	----do----	174 BOPD from Tyler, 4744-4792, 4826-4845.
The Texas Co., E. M. Thompson 1	3072	C SE¼SW¼ 12	1953	5252	----do----	Dry.
Roden, Darden & McRae, Ltd., Grebe "A" 2	3138	C SE¼SE¼ 12	1953	5250	----do----	Do.
The Texas Co., B. M. Horgen 1	3013	C SE¼NW¼ 13	1951	5657	Kibbey	50 BOPD from Tyler, 4765-4785; discovery.
The Texas Co., B. M. Horgen 2	3029	C NW¼SE¼ 13	1952	4920	Heath	Dry; oil show from Tyler, 4904-4932.
The Texas Co., B. M. Horgen 5	2989	C SW¼SW¼ 13	1954	4960	----do----	Dry.
The Texas Co., B. M. Horgen 6	3049	SE¼NE¼SE¼ 13	1955	4985	----do----	Do.
Texaco Inc., B. M. Horgen 8	3067	SE¼NE¼ 13	1959	5090	----do----	Do.
The Texas Co., E. L. Grebe "B" 1	2986	C NW¼NW¼ 14	1953	4851	----do----	Do.
McAlester Fuel Co., E. L. Grebe "A" 2	2986	NE¼NE¼NW¼ 14	1955	4870	Amsden	Do.
The Texas Co., E. L. Grebe "C" 1	2995	C SE¼NE¼ 14	1953	4870	----do----	Do.
McAlester Fuel Co., A. W. Eiselein et al. "A" 1	3003	NW¼NE¼SW¼ 14	1955	4910	Heath	Do.
The Texas Co., K. I. Thomas 1	3007	C NW¼SE¼ 14	1952	4905	----do----	Do.
The Texas Co., O'Neill-Ottman 4	3000	C NW¼SE¼ 14	1955	4930	----do----	Do.
The Texas Co., E. L. Grebe 8	3008	C SE¼SW¼ 15	1953	4900	Amsden	Do.
The Texas Co., E. L. Grebe "A" 10	3129	C NW¼SW¼ 15	1953	5044	Heath	Do.
Texaco Inc., E. L. Grebe 14	3011	C NE¼NE¼ 15	1960	4930	----do----	Do.
Gulf Oil Corp., State of Montana 6	3037	C SE¼NW¼ 16	1953	4970	----do----	Do.
Gulf Oil Corp., State of Montana 8	3080	C SE¼SE¼ 16	1957	5025	Tyler	Do.
Youngblood and Youngblood, Kincheloe 1	2952	C NE¼NE¼ 17	1952	5210	Otter	Do.
Continental Oil Co., A. Kincheloe "B" 1	3021	C NW¼NW¼ 17	1955	4750	Heath	Do.
L. L. Tuck-W. I. Lewis, Jr., Kincheloe "B" 1	2964	C SW¼SW¼ 18	1959	4901	Otter	230 BOPD from Tyler, 4580-4606; discovery.
L. L. Tuck-W. I. Lewis, Jr., Kincheloe "B" 2	2997	NE¼SW¼ 18	1960	4660	Tyler	Dry.
Continental Oil Co., Kincheloe-Federal Land Bank 1	2968	SW¼SE¼ 18	1959	4820	Heath	Do.
Continental Oil Co., Federal Land Bank-Kincheloe 3	2966	SW¼NE¼ 18	1960	4640	----do----	Do.
Continental Oil Co., Kincheloe "D" 1	2977	NW¼NW¼ 19	1959	4812	----do----	Do.
R. L. Harris et al., State of Montana 1	2959	C NE¼NE¼ 20	1953	4946	Tyler	Do
Juniper Oil & Mining Co., Sumatra-Federal 1	3148	C SE¼NW¼ 22	1958	5100	Heath	Do.
Juniper Oil & Mining Co., Sumatra-Federal 2	3068	NE¼NE¼NE¼ 22	1958	4980	----do----	Do.
Juniper Oil & Mining Co., Sumatra-Federal 3	3015	NW¼NE¼ 22	1960	4981	----do----	Do.
Texaco Inc., Roy Best 1	3119	C NE¼NW¼ 22	1960	5082	----do----	Do.
The Texas Co., O'Neill-Ottman 5	3051	W½NW¼NE¼ 23	1957	4961	----do----	Do.
The Texas Co., O'Neill-Ottman 6	3073	C SE¼NE¼ 23	1958	5052	----do----	Do.
Continental Oil Co., Retta H. Harris 5	3021	C NE¼SE¼ 24	1958	4948	----do----	Do.
Continental Oil Co., Retta H. Harris 6	3030	W½SE¼NE¼ 24	1958	4955	----do----	Do.
Continental Oil Co., Retta H. Harris 8	3071	C SW¼SW¼ 24	1958	5020	----do----	Do.
D. E. L. Byers, Ottman-O'Neill 1	3133	C SW¼SW¼ 25	1956	5149	Otter	Do.
Farmers Union Central Exchange, Inc., Sawyer 1	3210	C NE¼SW¼ 26	1950	5277	Heath(?)	222 BOPD from Tyler, 5258-5268, 32.5°API; discovery; abandoned 1953.
Farmers Union Central Exchange, Inc., Sawyer 2	3133	C NW¼SW¼ 26	1953	5248	Otter	Dry.
The Texas Co., O'Neill-Ottman 1	3198	C SE¼NW¼ 26	1951	5342	----do----	Dry; oil show from Tyler, 5204-5225.
Continental Oil Co., A. Kincheloe "C" 1	2900	C SE¼NW¼ 29	1957	5050	----do----	Dry.
L. L. Tuck-Will I. Lewis, Jr., Kincheloe "C" 1	3028	SW¼NW¼ 33	1959	5190	Heath	Do.
Vaughey & Vaughey, A. Kincheloe 1	3145	C NE¼SE¼ 34	1960	5145	----do----	Do.
Farmers Union Central Exchange, Inc., Nason 1	3248	C NE¼NW¼ 35	1951	5775	Kibbey	Do.
Vaughey & Vaughey, Kincheloe 1	3132	NW¼SW¼ 35	1959	5130	Heath	145 BOPD from Tyler, 4957-4965; discovery.
Miles Jackson, Inc., State of Montana 1	3143	SW¼SW¼ 36	1960	5221	----do----	Dry.
T. 11 N., R. 33 E.						
B. J. Taylor, Savage 1	3232	SE¼SE¼ 3	1959	5875	Heath	Dry.
B. J. Taylor, Kitzman 1	3291	C SE¼NE¼ 10	1960	5941	----do----	Do.
Champlin Oil & Refining Co., State 1	3282	C SW¼NW¼ 16	1961	6044	----do----	Do.
McAlester Fuel Co. et al., State of Montana "A" 1	3331	C NW¼NW¼ 16	1957	6250	----do----	Do.
The Texas Co., Red Wing Potteries, Inc., 2	3089	C NE¼SW¼ 18	1955	5040	----do----	Do.
Brinkerhoff Drilling Co., Nick Eich 1	3055	NW¼NW¼NW¼ 19	1957	5001	----do----	Do.
Sharples Oil Corp., Eich 1	3080	C NE¼NE¼ 19	1956	4940	----do----	Do.
Continental Oil Co., Eich 1	3034	SW¼NW¼ 19	1960	5020	----do----	Do.
Sumatra Oil Co., Eich 1	3040	NW¼NW¼ 19	1960	5080	----do----	Do.
Charles Matthews, L. C. Howard 1	3223	C NW¼NW¼ 21	1956	5231	Otter	Do.
U. S. Smelting, Refining & Mining Co., L. C. Howard 1	3164	C SW¼SE¼ 21	1957	5038	Heath	Do.
Sunray Mid-Continent Oil Co., R. P. Hauck 1	3276	NE¼NE¼NW¼ 24	1955	6637	Charles	Dry; oil show from Tyler, 5430-5460.
American Metal Co., Ltd., L. C. Howard 1	3155	SE¼SW¼NW¼ 27	1955	5003	Heath(?)	Dry.
The Texas Co., Northern Pacific RR. "H" 1	3063	C NE¼NW¼ 29	1951	5034	Otter	Do.
Continental Oil Co., Maris-Grebe 1	3130	NW¼SW¼ 30	1960	4998	Heath	Do.
Texaco Inc., Northern Pacific "E" (NCT-4) 1	3148	NW¼NW¼ 31	1959	5202	----do----	Do.
Lawrence Barker, Jr., Maris-Smith-Prather 1	3077	W½SW¼NW¼ 33	1958	5049	Otter	Do.
Sohio Petroleum Co., L. C. Howard 1	3205	C NW¼NW¼ 35	1956	5000	Heath	Do.
The Texas Co., State of Montana M-4098-1	3210	C SE¼NW¼ 36	1950	5475	Kibbey	74 BOPD from Tyler, 4415-4475, 34.4°API; discovery.
The Texas Co., State of Montana "B" 2	3234	C NE¼NW¼ 36	1954	7412	Cambrian rocks.	Dry; oil show from Tyler, 4470-4530.
T. 12 N., R. 31 E.						
Six Hundred Oil Co.-Pheister-Grenz, J. Collier 1	2770	SE¼SW¼SE¼ 32	1954	5431	Otter	Dry.
T. 12 N., R. 32 E.						
D. E. L. Byers, A. Kincheloe 1	2979	C NW¼NW¼ 23	1956	5419	Otter	Dry.
James H. Snowden et al., A. S. Kincheloe et al. 1	3016	C NW¼NE¼ 29	1955	5430	----do----	Do.
Six Hundred Oil Co., A. Kincheloe 1	3080	SE¼SE¼SE¼ 31	1954	5815	----do----	Do.
E. C. Brown, Grebe 1	2925	C SW¼NE¼ 33	1957	5550	----do----	Do.
Vaughey & Vaughey, E. L. Grebe 1	2932	C SE¼SW¼ 34	1960	5533	Heath	Do.

* of subsurface usage



COMPOSITE STRATIGRAPHIC SECTION OF OUTCROPPING FORMATIONS



INDEX MAP OF CENTRAL MONTANA AND AREA OF GEOLOGIC MAP

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—61451

GEOLOGY OF THE MELSTONE–SUMATRA AREA IN CENTRAL MONTANA

By

Howard R. Smith

SCALE 1:63 360

1 ½ 0 1 2 3 MILES

DATUM IS MEAN SEA LEVEL

1962

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