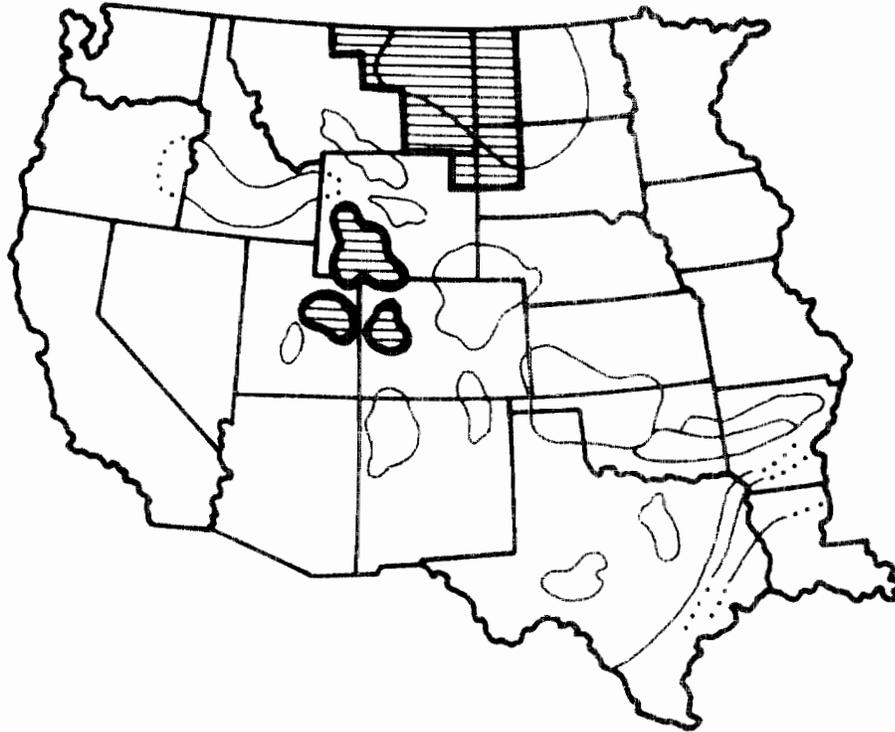


NVO/0655-07

Western Gas Sands Project

Quarterly Basin Activities Report



October 31, 1978

Prepared for
U.S. Department of Energy
Bartlesville Energy Technology Center
Charles H. Atkinson
Project Manager

Compiled by CER Corporation
Las Vegas, Nevada

Contract EY-76-C-08-0655



Handwritten: #C-847/2504

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Abbreviations and Acronyms

Completed Wells

WF	unsuccessful new field wildcat
WFD	new field discovery
WD	unsuccessful deeper pool wildcat
WDD	deeper pool discovery
WS	unsuccessful shallower pool wildcat
WSD	shallow pool discovery
WP	unsuccessful new pool wildcat
WPD	new pool discovery
WO	unsuccessful wildcat outpost
WOE	wildcat outpost extension
D	unsuccessful development well
DG	development gas well

Drilling/Staked Wells

WF	new field wildcat
WD	deeper pool wildcat
WS	shallower pool wildcat
WP	new pool wildcat
WO	wildcat outpost
D	development

BHC	Borehole Compensated Log
Comp	Drilling completed
DIL	Dual Induction Laterolog
D&A	Dry and Abandoned
FDC	Formation Density Log
FR	First Report
GR	Gamma Ray
MICT	Moving in Cable Tools
PB	Plugged back
SDW	Shut down for weather
SI	Shut in
Spud	Commencement of drilling
SP	Spontaneous Potential
SDR	Shut down for repairs
SN	Sidewall Neutron
Swb(d)(g)	Swabbed, swabbing
TD	Total Depth
WOCT	Waiting on completion tools

1. Introduction

This quarterly basin activities report is a summation of three months drilling and testing activities in the four primary study areas of the WGSP. This report details information in each study area for the months of July, August and September, 1978. Refer to Figure 1-1 for the location of study areas in the WGSP.

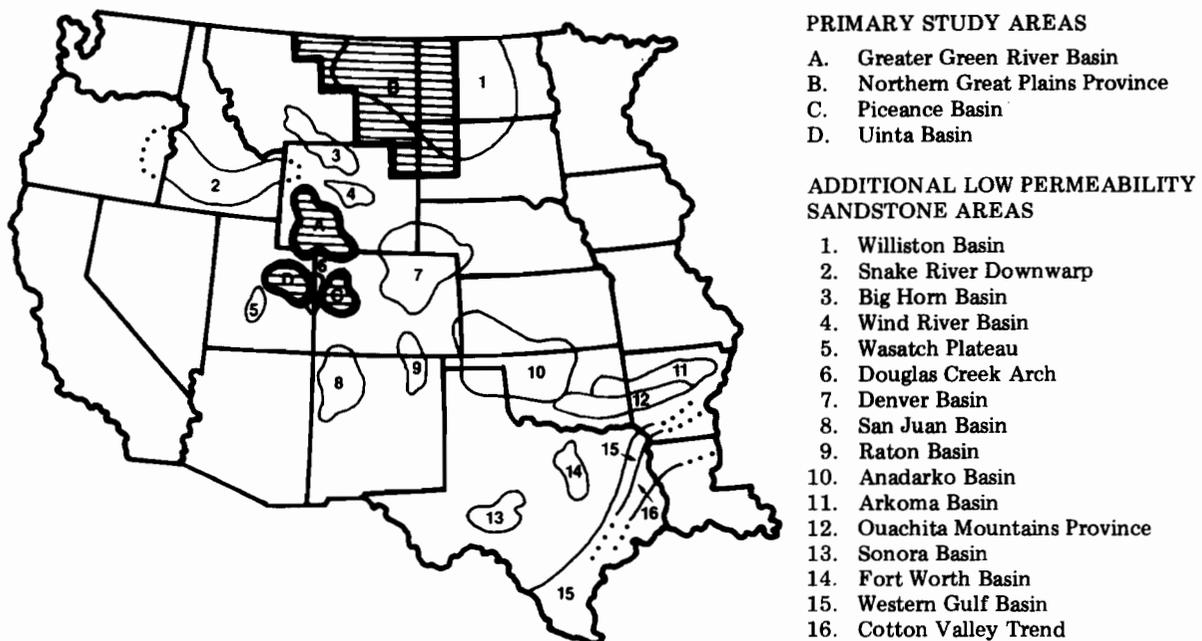


Figure 1-1 Map of Western United States, Showing Areas of Interest

The monitoring of basin activities is an important part of resource assessment and promotes cooperation between industry and government. This is especially evident in the Core Program. Certain areas in each study area have been recommended by USGS for obtaining core. Operators active in these specific areas are located by monitoring new activity in each area and contacted by DOE to negotiate contracts for a joint industry/government coring operation.

The summary of information on each study area is divided into two sections. The core program division identifies industry activity within the core sites and relates the status of WGSP core acquisition developments. The second section details drilling and testing operations of interest and tabulates production figures from horizons of interest. Newly staked and completed wells are listed and located on a map with orange and green numbers, respectively.

The drilling information used in this report was compiled primarily from *The Rocky Mountain Region Report*, published daily by Petroleum Information Corporation. Additional sources used were the *Montana Oil and Gas Journal*, *The Oil and Gas Journal* and the *Western Oil Reporter*.

Background and geologic information can be obtained from the Quarterly Basin Activities Reports, dated January 1, 1978, (NVO/0655-03), April 1, 1978, (NVO/0655-05) and July 31, 1978, (NVO/0655-06). Included in these reports are stratigraphic correlation charts, cross-sections and a brief account of the geology of each area and information relating to the USGS recommended coring locations. For information on the Core Program, refer to the *WGSP Core Program, January 12, 1978*. All of these reports may be obtained from Technical Information Center (TIC), P. O. Box 62, Oak Ridge, Tennessee, 37830, except the Core Program document, which is available from CER Corporation, 4220 So. Maryland Parkway, Suite 801, Las Vegas, Nevada 89109.

2. Northern Great Plains Province

2.1 CORE PROGRAM

Specific areas within Montana were selected by the USGS for the initiation of the WGSP Core Program (Figure 2-1 and 2-2). Four sites were chosen for the following reasons:

- The sites were removed from productive fields and little data is available.
- There are two or more potential reservoir intervals and adjacent source beds at the selected sites.
- The combination of these sites will test several different reservoir types, including sections with fine-grained carbonates, such as chalk, and fractured reservoirs found along lineament zones.

The objectives are Cretaceous horizons ranging from the Judith River Formation through the older Mowry Formation. Figure 2-3 is a correlation chart of Cretaceous rocks in the Northern Great Plains Province. Drilling depths to reach these objectives are shallower in the Province (2,000 - 4,000 ft) than in the basins of Wyoming, Colorado and Utah. Therefore, costs for recovering core and obtaining complete log data should be less than in basins where the objectives are deeper.

Operators active in and around the selected core areas are initially identified through information supplied by Petroleum Information Lease Maps and the *Rocky Mountain Region Report*.

The companies with drilling and testing operations in progress at the end of September were A.K. Guthrie, Joseph J.C. Paine & Associates, Midlands Gas Company, Trio Petro, Anschutz Corporation, Falcon-Colorado Exploration and Denmark Resources (see Table 2-1 and Figure 2-2). All of these operators were contacted during the quarter for possible participation in DOE's Core Program. No new agreements with industry were reached during the quarter.

The first operation under the WGSP Core Program was completed on July 12, 1978 at the Joseph J.C. Paine & Associates well (Midlands Federal 1-0296) located in Section 2, T29N, R36E, Valley County, Montana. Three hundred seventy-five feet of section was targeted and 293 feet was recovered in the Eagle, Carlile and Greenhorn Formations. Thirteen runs were made using a 30 ft core barrel. Two runs were made in the Upper Eagle, three runs in the Lower Eagle, five runs in the Carlile Formation and Bowdoin Member and three cores in the Greenhorn Formation including the Phillips Member. The cores were shipped to Core Lab, Casper, Wyoming for routine core analysis of selected intervals. The tests run were

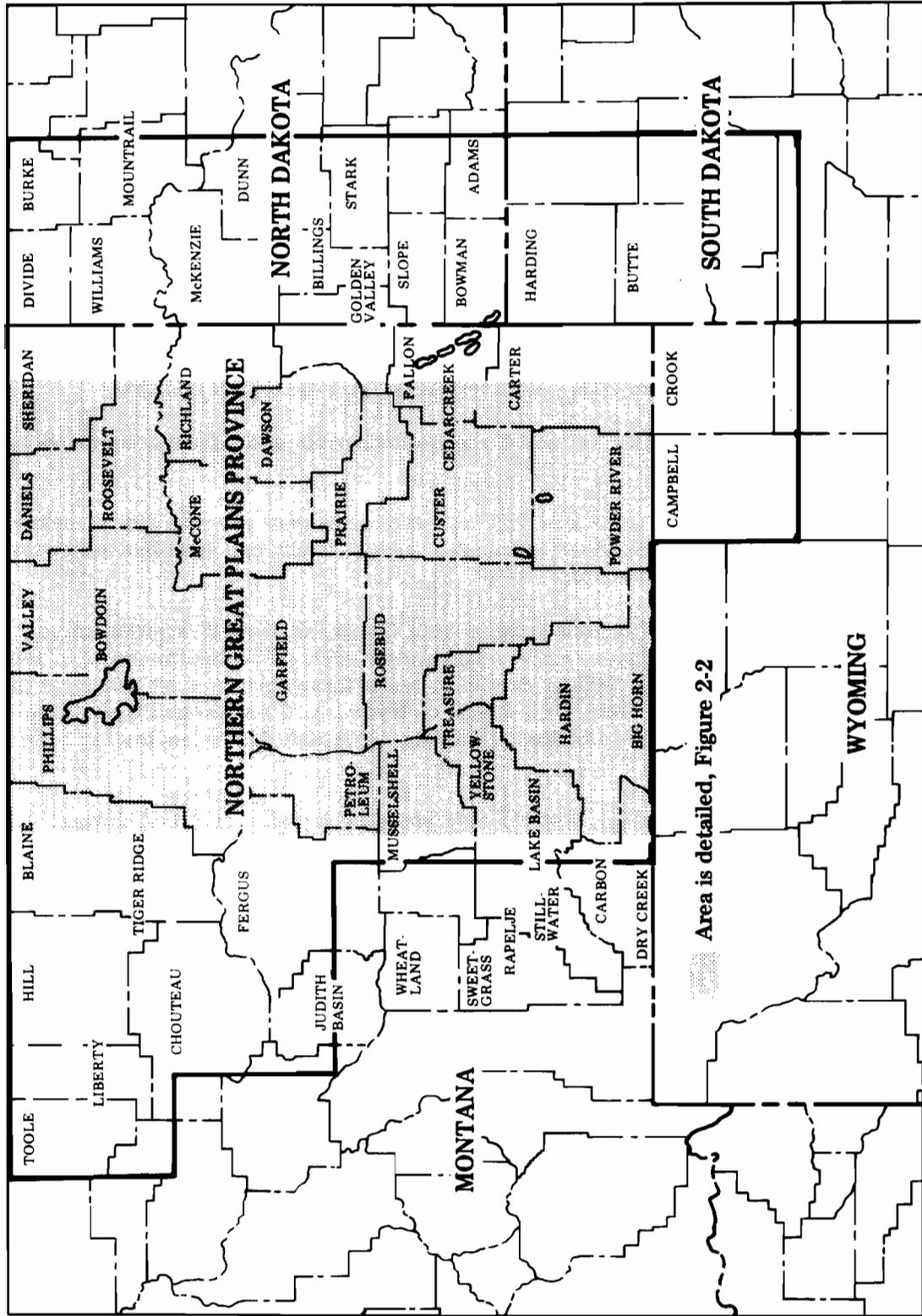


Figure 2-1 Northern Great Plains Province

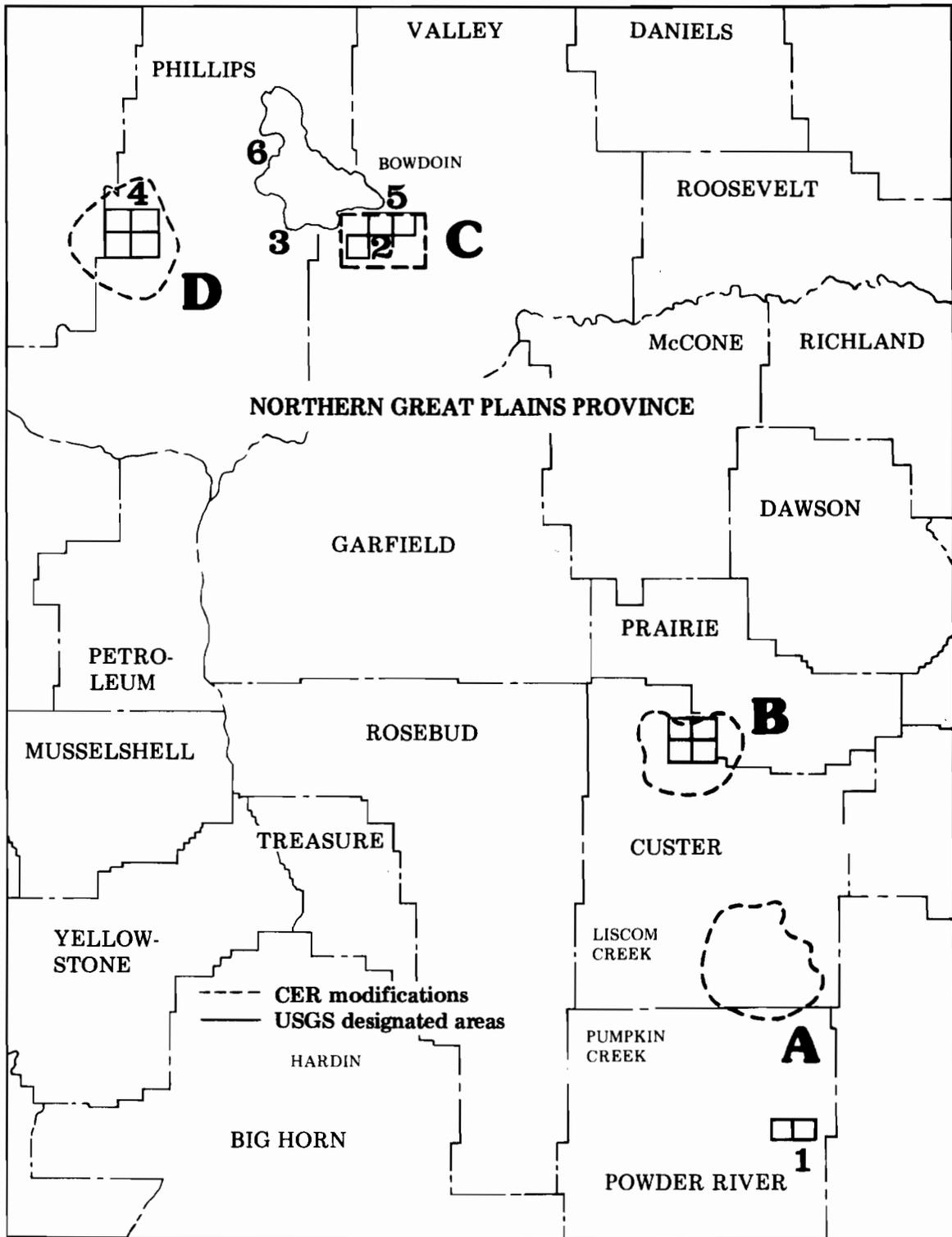


Figure 2-2 Detail of USGS Designated Core Areas and Wells of Interest, Northern Great Plains Province (refer to Table 2-1)

**Table 2-1 Summary of Wells Located in USGS Designated Core Areas—
Northern Great Plains Province¹ (Data as of September 30, 1978)**

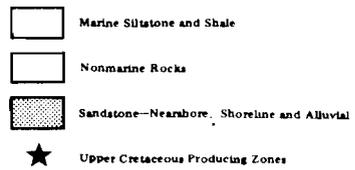
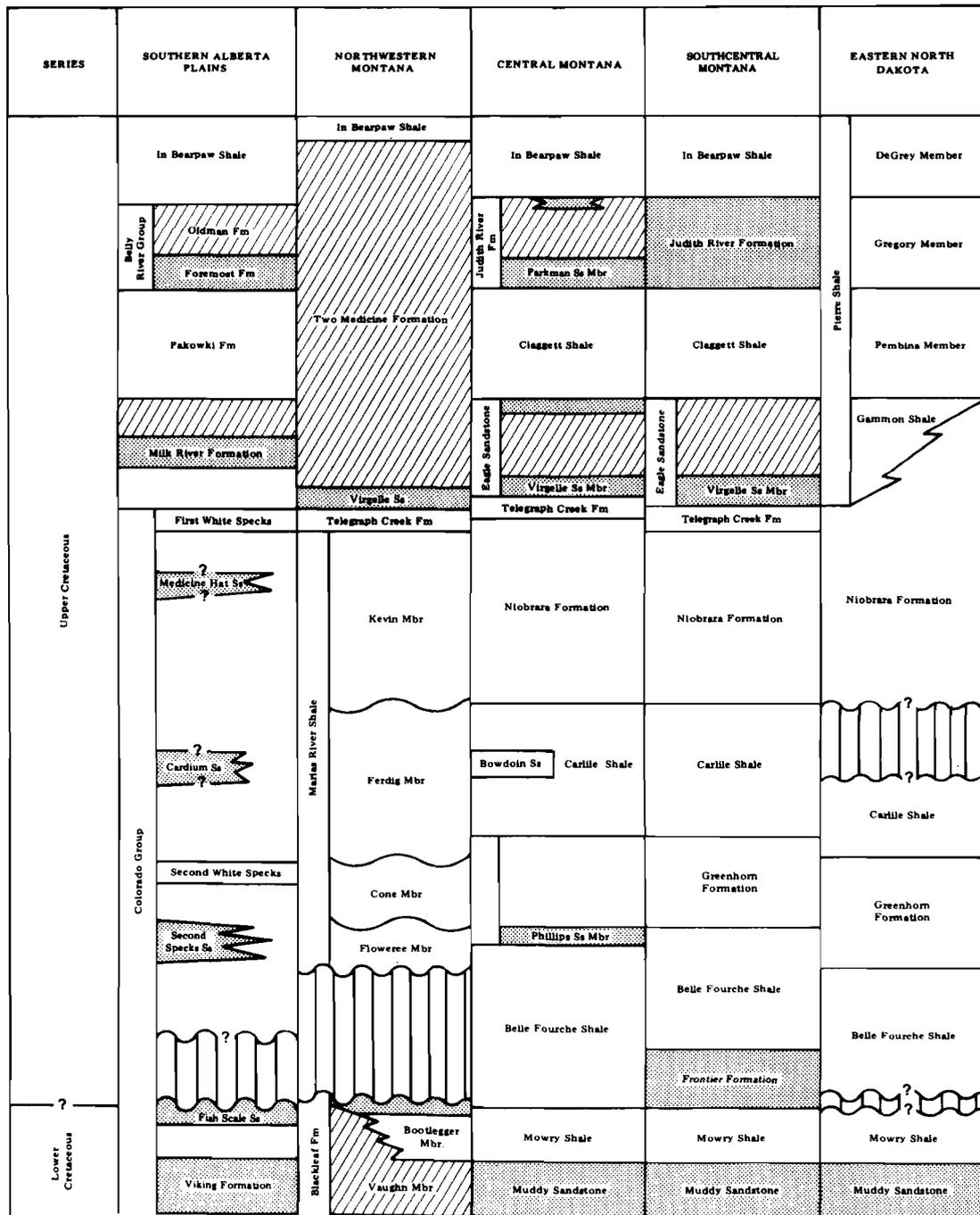
DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
FR: 9-29-78	A. K. Guthrie	1 Federal M-37119*	1	nwse 35/7S/53E Wildcat Field Powder River Cty, MT	Muddy Sand (5,000)			WF	
FR: 6-26-78	Joseph J. C. Paine & Associates	1-0296 Federal*	2	lot 6 2/29N/36E Wildcat Field Valley Cty, MT	Phillips (1,900)			WF, Operator has 8 new Phillips tests in this locale, well cored for WGSP core program	
Spud: 7-30-78 FR: 6-14-78	Midlands Gas Co.	1 Federal-0102 [†]	3	senw 1/30N/32E Bowdoin Field Phillips Cty, MT	Phillips	1,329 PB: 1,259		D, WOCT, no cores or tests, Operator has 3 Phillips tests in this locale	
FR: 6-28-78	Trio Petro	1 Nylander*	4	nwne 1/31N/27E Wildcat Field Phillips Cty, MT	Phillips (2,300)			WF, tight hole, Operator has 3 new Muddy tests in this locale	
FR: 5-30-78	Midlands Gas Co.	1 Federal 3415*	5	nwse 34/31N/35E Bowdoin Field Valley Cty, MT	Phillips (1,700)			D, Operator has 4 new Phillips tests in this locale	
Spud: 6-27-78 Comp: 7-1-78	Anschutz Corp.	1 Federal-5863 [†]	6	senw 7/32N/30E Wildcat Field Phillips Cty, MT	Phillips	1,835		WF, D&A, Operator has 3 Phillips tests in this locale	
FR: 9-19-78	Falcon Colorado Exploration	1-9 Fisher*	5	nwne 9/32N/35E Swanson Creek Field Valley Cty, MT	Phillips (1,800)			D, Operator has 3 new Phillips tests in this locale	
FR: 9-6-78	Denmark Resources	1-17 Fisher*	5	nwnw 17/32N/35E Swanson Creek Field Valley Cty, MT	Phillips (1,300)			D	
Spud: 7-20-78 FR: 6-20-78	Falcon Colorado Exploration	1-19 Federal [†]	5	nese 19/32N/35E Swanson Creek Field Phillips Cty, MT	Phillips	1,350	14,300 gal emul, 40,000 lb sand 14,349 gal emul 40,000 lb sand	D, testing, Operator has 9 Phillips tests in this locale	

¹ From Petroleum Information

² Refer to Figure 2-2

[†]Listed in Table 2-4

[‡]Listed in Table 2-3



U.S.G.S. Investigation
Chart OC-70, Published
by the U.S. Geologic
Survey, 1976.

Figure 2-3 Correlation Chart of Cretaceous Rocks of the Northern Great Plains Province

grain density, porosity, permeability, water saturation and a core gamma log on the entire core. Core samples have been sent to BETC, LASL, Texas A&M University and USGS. Refer to Table 3-1, page 22 of the *WGSP Status Report, September 30, 1978, NVO/0655-112* for the complete conventional core analysis on this well.

2.2 DRILLING ACTIVITY

During the third quarter of 1978, 87 wells were completed in horizons of interest to the WGSP in the Northern Great Plains Province, more than two and one-half times the number completed during the second quarter. Exploratory drilling (wildcat completions) increased by 14 wells from the second quarter total of 10 for a 140 percent improvement and had a success rate of 29 percent (7 discovery wells). There was a three-fold increase in development wells completed during the third quarter and 40 percent of the wells were producers.

Producing horizons were the Eagle, Bowdoin, Phillips, Bow Island and commingled Bowdoin/Greenhorn/Phillips, and Colorado/Blackleaf/Bow Island. Completions during the third quarter of interest to the WGSP accounted for 23,995 MCFD of new gas production (Table 2-2).

Table 2-2 Summary of Drilling Activities, Northern Great Plains Province*

	NO. OF WELLS				Producing Horizons in MCFD														Total				
	Wildcats		Development		Judith River	Clasgett	Eagle					Bowdoin	Carlisle		Greenhorn		Bow Island - Muddy	Commingled					
	D&A	Disc	D&A	Prod.			Undiscovered	Vineville	Shannon	Teasdale Creek	Alvord		Undiscovered	Phillips	Belle Fourche Shale	Proctor				Blackleaf			
3rd Quarter 1977	13	6	13	40	72	0	0	1,249 ⁹	0	0	0	0	0	4,924	0	354	0	622	630 ¹⁰	0	6,280 ¹¹	23,719 ¹²	37,778
4th Quarter 1977	13	6	17	50	86	340	0	7,068 ¹	0	1,348	0	0	0	1,126	0	1,911	0	227	1,417	0	5,373	12,359 ²	31,169
1st Quarter 1978	13	3	13	26	55	40	0	6,985	0	0	0	0	not available	0	0	50	0	0	259	0	2,489	17,943 ³	27,766
2nd Quarter 1978	9	1	4	10	24	0	0	5,174 ⁴	0	0	0	0	0	0	0	0	0	0	645	0	0	253 ⁵	6,072
3rd Quarter 1978	17	7	38	25	87	0	0	18,975 ⁴	0	0	0	0	0	1,406	0	410 ⁶	0	0	0	0	1,406	1,798 ⁷	23,995

1. IPF not available from 1 producing well.
2. Commingled production - Bowdoin/Greenhorn - 12,359 MCFD
3. Commingled production - Judith River/Eagle - 60 MCFD
Bowdoin/Phillips - 15,894 MCFD
Bowdoin/Greenhorn/Phillips - 844 MCFD
Greenhorn/Phillips - 1,145 MCFD
4. IPF not available from 1 producing well.
5. Commingled Production - Fish Scales/Bow Island - 253 MCFD
6. Eagle production: natural - 13,931 MCFD
treated - 5,044 MCFD
7. Commingled production - Bowdoin/Phillips - 284 MCFD
Bowdoin/Greenhorn - 368 MCFD
Blackleaf/Spike (natural) - 699 MCFD
Bowdoin/Greenhorn/Phillips - 447 MCFD
8. 158 MCFD of 410 MCFD was natural "White Specks" (Phillips production)
9. Natural Eagle production
10. Natural Blackleaf production
11. 4,245 MCFD - natural Bow Island, 735 MCFD treated Bow Island and 1,300 MCFD - Muddy production
12. Commingled production - Bowdoin/Greenhorn/Phillips - 14,878 MCFD
Bowdoin/Greenhorn - 1,180 MCFD
Bowdoin/Phillips - 3,446 MCFD
Prairie/Greenhorn/Phillips - 3,690 MCFD
Colorado/Blackleaf/Bow Island - 89 MCFD
Colorado/2nd Bow Island - 436 MCFD

*Data Compiled from P.I. Rocky Mountain Region Report "Completions," October 6, 1977—October 4, 1978.

New developments within the Province were closely monitored during the quarter for possible inclusion of a well into the WGSP Core and Logging Programs. The majority of work during the quarter was development and exploration of the large structural features in northern Montana, i.e. the Kevin Sunburst Dome, Bearpaw Arch, Bowdoin Dome and areas in the northcentral part of the state with uncertain potential. Approximately 60 wells were scheduled to be drilled on the Bowdoin Dome and Kansas Nebraska Natural Gas plans to hook up 152 presently shut in wells before the end of 1978. Most of this new work is located on the north side of the field. Joseph J.C. Paine & Associates, also active in the Bowdoin Dome area, has about 36 wells capable of production on the north side. The company scheduled about 22 additional wells to be drilled in northern Phillips County and several tests in the undeveloped Vandalia area in Valley County.

During July 32 new wells were staked and at the end of September, six were D&A, eight reached total depth, three were producing gas and one well was drilling. In August, the number of new locations increased to 74, which was partially due to a 20 well series in Leroy Field by Fuel Resources Development and a 17 to 20 well development program in the Bowdoin Field in Phillips County by Midlands Gas Company. At the end of September, 14 wells were completed D&A, 17 had reached total depth and four were drilling. Forty new wells were staked during September. Twenty-six of the wells were located in proven gas fields and 14 were wildcats. The objectives throughout the entire quarter were the Eagle and Greenhorn Formations, Phillips Member and the Bow Island Formation. By September 30, three of these locations were spudded and drilling ahead, one well was completed D&A, another had reached total depth and one location was abandoned. Refer to Tables 2-3 and 2-4 for summaries of wells completed and newly staked, respectively, and Figures 2-4 and 2-5 for the locations of these wells.

The southern part of the Northern Great Plains Province generally has much less activity than in the northern Montana counties. Two wells were staked this quarter of interest to the WGSP due to their location and projected horizon. Webb Resources, located a probable Dakota test going to 8,200 ft on the southwestern boundary of the Province and A.K. Guthrie staked a well to test the Muddy in the vicinity of core area A (see Table 2-4 and Figure 2-4).

The search for new gas pools continued in South Dakota during the quarter. Three gas plays were in progress at quarter's end, however information about the projects was limited. Jerry McCutchin set pipe on the seventh Shannon gas well in West Short Pine Hills Field in Harding County. The last three wells drilled yielded flows between 400 and 500 MCFD according to a *Montana Oil & Gas Journal* report. Montana Dakota will run a pipeline to this field sometime later this year.

Table 2-3 Summary of Wells Completed—Northern Great Plains Province¹
(Data as of September 30, 1978)

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 6-24-78 FR: 5-9-78	Fuel Resources Development	10-24-18-B Olson	1	swnw 10/24N/18E Leroy Field Blaine Cty, MT	Eagle	1,741		D, WOCT - Operator has 9 Eagle tests in this locale	
Spud: 8-15-78 Comp:	Tricentrol United States	8-5 Wortman	1	swnw 8/25N/18E Sherard Unit Field Blaine Cty, MT	Eagle	1,900		D, D&A, Operator has 8 Eagle tests in this locale	
Spud: 6-29-78 Comp: 7-2-78	Montana Power	5-12 USA	1	swnw 12/27N/20E Wildcat Field Blaine Cty, MT	Eagle	869		WF, D&A, no cores	
No spud reported	Montana Power	7-17J. Pursley	2	swne 17/28N/14E Unnamed Field Chouteau Cty, MT	Eagle	2,017		D, WOCT	
Spud: 7-19-77 Comp: 7-22-78	Tricentrol United States	1-1 Hegle	3	nene 1/30N/15E Tiger Ridge Field Hill Cty, MT	Eagle (1,389-1,436)	1,600 PB: 1,509	Sd fract-- 38,000 lb sand	DG, no cores or tests	1,200
Spud: 6-21-78 Comp: 6-25-78	Tricentrol United States	14-11 Nystron	3	nesw 14/30N/15E Tiger Ridge Field Hill Cty, MT	Eagle (1,477-1,620)	1,850 PB: 1,781	Natural	DG, no cores or tests	1,500
Spud: 7-25-78 Comp: 7-27-78	Tricentrol United States	1-15 Ross	3	swse 1/30N/17E Tiger Ridge Field Blaine Cty, MT	Eagle (1,134-1,196)	1,400 PB: 1,301	Sd fract-- 30,000 lb sand	DG, no cores or tests	500
Spud: 7-20-78 Comp: 7-23-78	Tricentrol United States	4-3 U.S.	4	nenw 4/30N/18E Tiger Ridge Field Blaine Cty, MT	Eagle (1,442-1,458)	1,700 PB: 1,570	Sd fract	DG, no cores or cores	400
Spud: 7-23-78 Comp: 7-25-78	Tricentrol United States	10-4 U.S.	4	nwnw 10/30N/18E Tiger Ridge Field Blaine Cty, MT	Eagle (1,344-1,359)	1,500 PB: 1,470	Sd fract	DG, no cores or tests	44
Spud: 7-30-78 FR: 6-14-78	Midlands Gas Company	1 Federal-0102*	5	senw 1/30N/32E Bowdoin Field Phillips Cty, MT	Phillips	1,329 PB: 1,259		D, WOCT, no cores or tests, Operator has 3 Phillips tests in this locale	
Spud: 7-15-78 Comp: 7-18-78	Tricentrol United States	4-13 Neuwerth	3	sww 4/31N/15E Tiger Ridge Field Hill Cty, MT	Eagle (1,264-1,267)	1,610 PB: 1,341	Sd fract, 15,000 lb sand	DG, no cores or tests	900
Spud: 4-24-78 FR: 4-14-78	Elenburg Exploration	12-32 Solomon	3	nws 32/31N/17E Tiger Ridge Field Hill Cty, MT	Eagle	1,701		D, perf 1,208-1,212, testing	
Spud: 6-1-78 FR: 5-31-78	J. Burns Brown	5-32-15 B State	3	sene 5/32N/15E Unnamed Field Hill Cty, MT	Eagle	1,194		D, WOCT, Operator has 7 Eagle tests in this locale	

Table 2-3 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 5-9-78 FR: 5-5-78	J. Burns Brown	832-15 Sathre	3	nene 8/32N/15E Unnamed Field Hill Cty, MT	Eagle	1,133		D, WOCT, tight hole	
Spud: 4-14-78 FR: 4-13-78	J. Burns Brown	15-32-18 WERK	4	swsw 15/32N/18E Wildcat Field Blaine Cty, MT	Eagle	1,400		WF, WOCT	
Spud: 5-28-78 Comp: 8-18-78	Tricentrol United States	16-9 States	4	nese 16/32N/18E Unnamed Field Blaine Cty, MT	Eagle (1,107- 1,113)	1,430 PB: 1,185	Sd wtr frac	WFD, no cores or tests - Eagle Discovery	2,000
FR: 4-24-78	J. Burns Brown	9-32-19 Wright	4	swse 9/32N/19E Unnamed Field Blaine Cty, MT	Eagle (1,600)			D, abandoned location	
Spud: 6-27-78 Comp: 7-1-78	Anschutz Corp.	1 Federal-5836*	6	senw 7/32N/30E Wildcat Field Phillips Cty, MT	Phillips	1,835		WF, D&A, Operator has 3 tests in this locale	
Spud: 7-20-78 FR: 6-20-78	Falcon-Colorado Exploration	1-19 Federal*	7	nese 19/32N/35E Swanson Creek Field Phillips Cty, MT	Phillips	1,350	14,300 gal emul 40,000 lb sand 14,349 gal emul 40,000 lb sand	D, testing, Operator has 9 Phillips tests in this locale	
Spud: 7-28-78 Comp: 7-27-78	Gordon H. Prescott	1 State	8	nwnw 3/33N/4E Wildcat Field Liberty Cty, MT	Bow Island	2,482		WF, D&A	
Spud: 4-28-78 FR: 4-19-78	Elenburg Exploration	2-18 Gagel	9	swnw 18/33N/15E Wildcat Field Hill Cty, MT	Eagle	1,452		WF, WOCT, no cores	
Spud: 4-24-78 FR: 4-24-78	J. Burns Brown	30-33-15 Long	9	nwse 30/33N/15E Badlands Gas Hill Cty, MT	Eagle	1,300		D, WOCT, tight hole	
Spud: 6-21-78 FR: 6-5-78	Havre Drilling	1 State	10	swse 28/33N/18E Lohman Gas Field Blaine Cty, MT	Eagle	1,144		D, WOCT	
Spud: 5-18-78 FR: 5-4-78	J. Burns Brown	29-33-18 Nemetz	10	swse 29/33N/18E Lohman Gas Field Blaine Cty, MT	Eagle	1,194		D, WOCT, Operator has 5 Eagle tests in this locale	
Spud: 4-17-78 Comp: 4-28-78	Midlands Gas	1 Federal 1441	12	senw 14/34N/31E Unnamed Field Phillips Cty, MT	Phillips (1,273- 1,293)	1,400 PB: 1,346	190 BW, 40,000 lb sand	DG	252
Spud: 6-27-78 Comp: 6-29-78	Walsh & Watts	Cyrus Frost 1-8 Thomas	11	nwnw 8/35N/16E Wildcat Field Hill Cty, MT	Eagle	1,600		WF, D&A, no cores or tests	
Spud: 4-21-78 FR: 4-19-78	Xeno Inc.	6-7 E. Chouteau	13	senw 7/35N/20E Unnamed Field Blaine Cty, MT	Eagle	1,645		D, prep to run casing	

Table 2-3 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 6-20-78 FR: 5-15-78	Anschutz Corp.	1 Dyr Dahl	14	senw 31/35N/30E Wildcat Field Phillips Cty, MT	Phillips	1,880		WF, WOCT, no cores or tests	
Spud: 2-28-78 Comp: 6-22-78	Sun Oil	1-18 Breed Creek Ranch	15	nsw 18/36N/4E Middle Butte Field Liberty Cty, MT	Bow Island (1,650-1,770)	1,969 PB: 1,921	Sd fract	DG, no cores or tests	1,313
Spud: 11-16-77 FR: 11-8-77	Oil Resources	Pet Resources 30-4 Hodges	16	nwnw 30/36N/8E Unnamed Field Hill Cty, MT	2nd White Specks (Phillips)	2,500 PB: 1,871		SI	
Spud: 6-2-78 FR: 4-28-78	Xeno Inc.	11-23 Battle	17	sese 23/36N/19E Unnamed Field Blaine Cty, MT	Eagle	1,640		D, WOCT	
Spud: 6-5-78 FR: 4-3-78	Xeno Inc.	13-24 Battle	17	sww 24/36N/19E Unnamed Field Blaine Cty, MT	Eagle	1,707		D, WOCT	
Spud: 4-11-78 Comp: 5-16-78	Midlands Gas Corp.	1 Hellie 0560	18	nene 5/36N/30E Bowdoin Field Phillips Cty, MT	Bowdoin (1,294-1,349)	1,600 PB: 1,405	359 gal wtr. 40,000 lb sand	DG	288
Spud: 11-8-77 Comp: 11-11-77	Midlands Gas Corp.	1 Hellie 1060	18	swne 10/36N/30E Unnamed Field Phillips Cty, MT	Bowdoin (1,335-1,400) Phillips (1,514-1,579)	1,690 PB: 1,632	321 BW, 40,000 lb sand 340 BW, 34,000 lb sand	DG, commingled	284
Spud: 7-26-78 FR: 6-28-78	Joseph J. C. Paine & Associates	10562 Anderson	18	nesw 5/36N/32E Unnamed Field Phillips Cty, MT	Phillips	1,650		D, WOCT	
Spud: 8-14-78 FR: 5-19-78	Odessa Natural	313632 Fee	18	senw 31/36N/32E Unnamed Field Phillips Cty, MT	Phillips	1,625		D, perf, fract	
Spud: 11-11-77 Comp: 5-4-78	Midlands Gas Corp.	1 Harrison Larouche	18	swse 7/37N/31E Unnamed Field Phillips Cty, MT	Bowdoin (1,516-1,563) Greenhorn (1,688-1,6	1,871 PB: 1,781	317 BW, 40,000 lb sand, acidized 250 gal, 163 BW, 40,000 lb sand	DG, commingled	368
Spud: 5-12-78 FR: 5-17-78	Jerry McCutchin	1018 Heikkila	19	w1/4se 18/16N/2E West Short Pine Field Harding Cty, SD	Shannon	1,480		D, WOCT	

¹ From Petroleum Information

² Refer to Figure 2-4 and 2-5

* Listed in Table 2-1

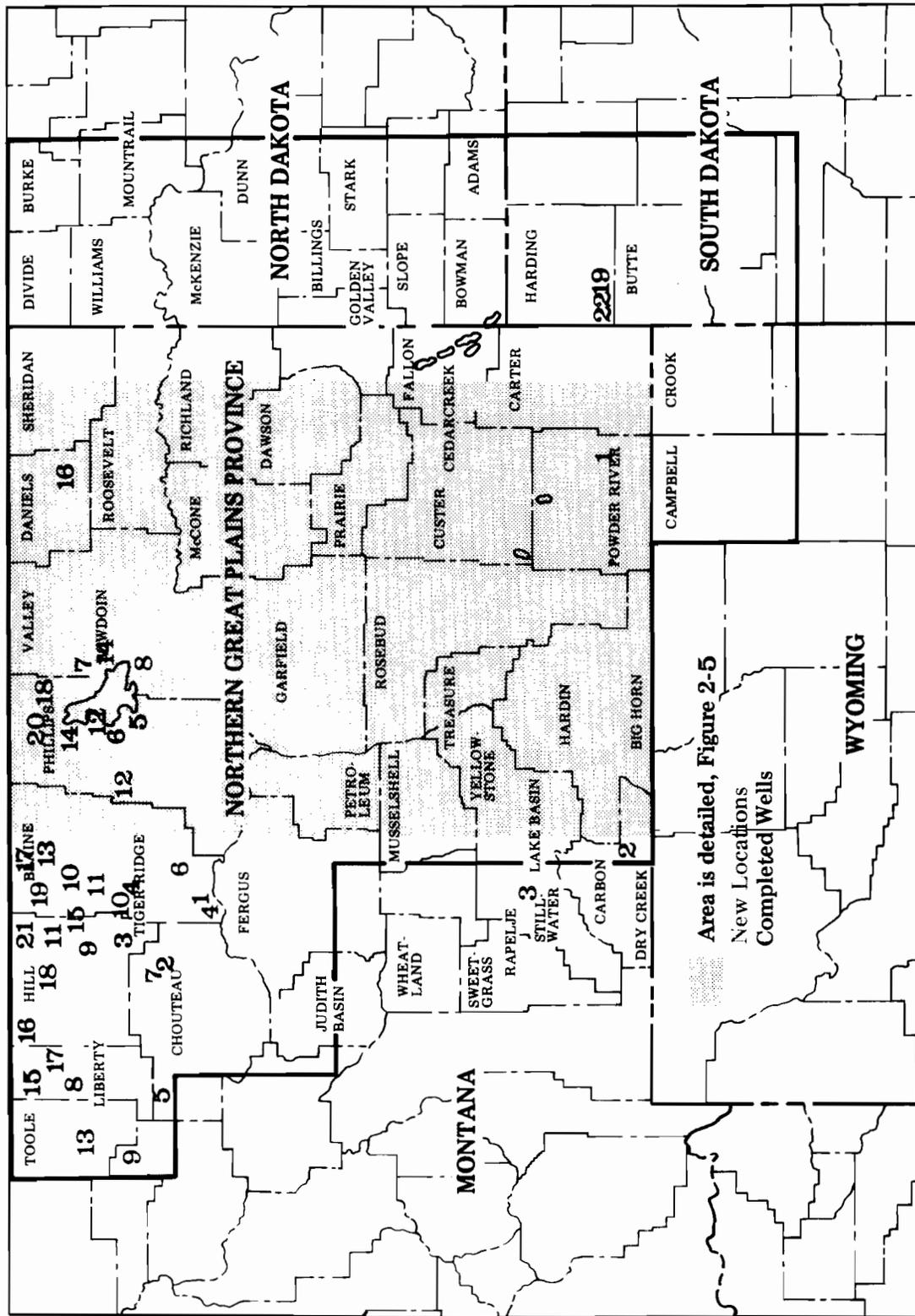


Figure 2-4 Northern Great Plains Province Showing Wells of Interest (refer to Tables 2-3 and 2-4)

Table 2-4 Summary of New Wells—Northern Great Plains Province¹
(Data as of September 30, 1978)

DATE	OPERATOR	WELL NAME	MAP INDEX NO ²	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 9-29-78	A. K. Guthrie	1 Federal M-37119*	1	nwse 35/7S/53E Wildcat Field Powder River Cty, MT	Muddy Sand (5,000)	WF
FR: 9-29-78	Webb Resources	9-7 Federal (M-9522)	2	swne 9/8S/22E Wildcat Field Carbon Cty, MT	? (8,200)	WF
FR: 8-30-78	Macquest Petroleum	1 Kirchner	3	sene 8/2N/20E Rapelge Field Stillwater Cty, MT	Eagle (1,020)	D
FR: 7-31-78	Montana Power	14-22 Castle Unit	3	sesw 22/2N/21E N Lake Basin Field Stillwater Cty, MT	Eagle (1,425)	D
FR: 8-1-78	Fuel Resources Development	DEV G-1-23-17N M-16326	4	swne 1/23N/17E Wildcat Field Blaine Cty, MT	Eagle (1,652)	WF, Operator has 14 new Eagle tests in this locale
FR: 9-14-78	Superior Oil	12-1 WE Bird	4	swne 12/24N/18E Leroy Field Blaine Cty, MT	Eagle (2,100)	D, Operator has 4 new Eagle tests in this locale
FR: 9-12-78	Polumbus Petroleum	28-7 Rossmiller	5	swne 28/26N/3E Wildcat Field Chouteau Cty, MT	Bow Island (1,335)	WF
FR: 8-1-78	Fuel Resources Development	1-21-26-21-N M-14946	6	nese 21/26N/21E Wildcat Field Blaine Cty, Mt	Eagle (1,076)	WF, Operator has 5 new Eagle tests in this locale
FR: 8-30-78	Energetics Inc.	24-18-2 Federal	6	sesw 18/27N/20E Sawtooth Mtn Field Blaine Cty, MT	Telegraph Creek (1,600)	D
FR: 9-15-78	Elenburg Exploration	23-28-13 CanKee	7	sene 28/28N/13E Wildcat Field Chouteau Cty, MT	Eagle (1,200)	WF, Operator has 3 new Eagle tests in this locale
FR: 9-29-78	Montana Power	16-8 Trunk	7	sese 8/28N/14E Unnamed Field Chouteau Cty, MT	Eagle (3,500)	D
Spud: 4-10-78 FR: 4-13-78	J. Burns Brown	1-29-14 Rocky Boy	7	sese 1/29N/14E Unnamed Field Chouteau Cty, MT	Eagle (2,000)	D, drilling, no depth reported, tight hole. Operator has 2 Eagle tests in this locale
FR: 9-29-78	Balcron Oil	2B-11X McCracken	9	nwse 11/29N/1W Ledger Field Pondera Cty, MT	Bow Island (784)	D, Operator has 2 Bow Island tests in this locale
FR: 6-26-78	Joseph J. C. Paine & Associates	1-0296 Federal*	8	Lot 6 2/29N/36E Wildcat Field Valley Cty, MT	Phillips (1,900)	WF, Operator has 8 new Phillips tests in this locale, well cored for the WGSP core program
FR: 8-21-78 Spud: 8-21-78	Marquis Petroleum	21-1 JGL Ranch	9	nene 21/30N/2W Wildcat Field Pondera Cty, MT	Bow Island (1,500)	WF, †1,510, prep to log
FR: 8-28-78	Diamond Shamrock	1-34 Underdahl Fee	9	senw 34/30N/2W Wildcat Field Toole Cty, MT	Bow Island (900)	WF, Operator has 2 new Bow Island tests in this locale

Table 2-4 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO ²	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 8-31-78	Tricentrol United States	10-1 Blackwood	10	nene 10/30N/17E Tiger Ridge Field Blaine Cty, MT	Eagle (1,450)	D, Operator has 4 new Eagle tests in this locale
FR: 6-23-78	Montana Power	10-17 Hayes	11	nwse 17/31N/19E Bowes Field Blaine Cty, MT	Eagle (1,500)	D
FR: 6-28-78	Trio Petro	1 Nylander*	12	nwne 1/31N/27E Wildcat Field Phillips Cty, MT	Phillips (2,300)	WF, tight hole, Operator has 3 new Muddy tests in this locale
FR: 5-30-78	Midlands Gas	1 Federal 3415*	12	nwse 34/31N/35E Bowdoin Field Valley Cty, MT	Phillips	D, Operator has 4 new Phillips tests in this locale
FR: 6-9-78	J. Burns Brown	3-32-15 State	13	swne 3/32N/1W Unnamed Field Toole Cty, MT	Eagle (1,600)	D
FR: 9-8-78 Spud: 10-1-78	Tricentrol United States	19-16 Fox	11	sese 19/32N/13E Tiger Ridge Field Blaine Cty, MT	Eagle (1,500)	D, @ 157, WOC, Operator has 1 new Eagle test in this locale
FR: 9-19-78	Falcon Colorado Exploration	1-9 Fisher*	14	nwne 9/32N/35E Swanson Creek Field Valley Cty, MT	Phillips (1,800)	D, Operator has 3 new Phillips tests in this locale
FR: 9-6-78	Denmark Resources	1-17 Fisher*	14	nwnw 17/32N/35E Swanson Creek Field Phillips Cty, MT	Phillips (1,300)	D
FR: 9-29-78	Wexpro	1-13 Potlatch	13	nwsW 13/33N/1W North Dunkirk Toole Cty, MT	Bow Island	WO
FR: 9-18-78 Spud: 9-30-78	Benson Mineral Group	1-23 Hoehn	15	nenn 23/34N/17E Wildcat Field Blaine Cty, MT	Greenhorn (2,400)	WF, @ 175, WOC, Operator has 2 Greenhorn tests in this locale
FR: 8-22-78	Ashland Exploration	1 Culbertson State Bank	16	senw 22/34N/49E Wildcat Field Daniels Cty, MT	Mississippian (6,500)	WF
FR: 6-23-78	Montana Power	8-12 Keith- Standiford	17	sene 12/35N/6E Unnamed Field Liberty Cty, MT	Bow Island (2,200)	D
FR: 8-9-78 Spud: 8-16-78	Xeno Inc	13-14 SW Saddle	18	swsw 14/35N/13E Wildcat Field Hill Cty, MT	Greenhorn (2,500)	WF, drilling 2,280, Operator has 4 new Eagle tests and a Greenhorn test in this locale
FR: 9-22-78 Spud: 9-26-78	Montana Power	15-4 Lenhart	18	swse 4/35N/15E Wildcat Field Hill Cty, MT	Bow Island (2,700)	WF, drilling 2,319, Operator has 2 new Bow Island test in this locale
FR: 7-5-78 Spud: 7-5-78	Xeno Inc	12-12 NW Saddle	18	nwsW 12/36N/13E Unnamed Field Hill Cty, MT	2nd White Specks (2,600) (Phillips)	WO, drilling, no depth reported, tight hole

Table 2-4 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO ²	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
Spud: 6-23-78 FR:	Xeno Inc	5-32 NE Saddle	18	swnw 32/36N/14E Wildcat Field Hill Cty, MT	2nd White Specks (2,620) (Phillips)	WF, drilling, no depth reported, tight hole
Spud: 5-28-78 FR: 4-10-78	Xeno Inc	6-27 Battle	19	senw 27/36N/19E Unnamed Field Blaine Cty, MT	Eagle (1,740)	D, drilling, no depth reported, tight hole, Operator has 12 Eagle tests in this locale
FR: 8-14-78	Midlands Gas	1 Federal 0660	20	nenw 6/36N/30E Unnamed Field Phillips Cty, MT	Phillips (2,100)	WO, Operator has 7 new Phillips tests in this locale
FR: 9-5-78	Joseph J. C. Paine & Associates	0762-1 Murdock	20	nws 7/36N/32E Unnamed Field Phillips Cty, MT	Phillips (1,700)	D, Operator has 2 new Phillips tests in this locale
FR: 9-14-78	Odessa Natural Corporation	1 Mavencamp	20	swnesw 7/36N/33E Wildcat Field Phillips Cty, MT	Phillips (1,600)	WF, Operator has 2 additional Phillips tests in this locale
FR: 8-9-78	Xeno Inc	1-22 E Signal	21	nene 22/37N/16E Wildcat Field Hill Cty, MT	Eagle (1,700)	WF
FR: 9-28-78	Midlands Gas	1 Federal 0170	20	senw 1/37N/30E Unnamed Field Phillips Cty, MT	Phillips (2,100)	D
FR: 7-6-78	Jerry McCutchin Jr.	4 Heikkila	22	nwse 7/16N/2E West Short Pine Hills Field Harding Cty, SD	Shannon (2,000)	D, Operator has 2 Shannon tests in this locale

¹ From Petroleum Information

² Refer to Figures 2-4 and 2-5

*Listed in Table 2-1

3. Greater Green River Basin

3.1 CORE PROGRAM

To assess the resource potential within the Greater Green River Basin the USGS recommended core acquisition in the following areas:

Area A

The crest of the Wamsutter Arch in Sweetwater and Carbon Counties, the northern edge of which borders on the Red Desert Basin and the southern edge occupies part of the Washakie Basin, T17N to T21N, and R91W to R97W. The section below the commercial Almond and Ericson (Mesaverde) is of primary interest in this area.

Area B

The area east of the Big Piney/LaBarge Field in Sweetwater and Sublette Counties, running north and south through the Pinedale area and to the northern edge of the Green River Basin. These areas skirt the edge of the Wind River Range. Production here is primarily Frontier, with some Mesaverde and Ft. Union tests.

Area B has been divided into four subdivisions which are:

- B₁ West of R104W to R109W and from T22N, north to T28N
- B₂ R106W to R111W and from T27N to T31N
- B₃ R108W to R112W but not including development drilling, and T30N to T35N
- B₄ North edge of Green River Basin; north into the Hoback Basin, T36N to 39N and R11W to 114W.

The core sites contain thick sections of tight, but generally untested gas sands with "tight gas sand" potential in Upper Cretaceous and Tertiary formations. Operators active in these areas are being contacted concerning possible participation in DOE's Core Program.

Many operators were active in core area A, during the third quarter (Figure 3-1) however, most were drilling to the commercial Almond and Ericson Formations of the Mesaverde Group (9,200 - 11,000 ft) which are not of primary interest to the WGSP. Active operators were Amoco Production, Davis Oil, Sun Oil, Cotten Petroleum and Sinclair Oil.

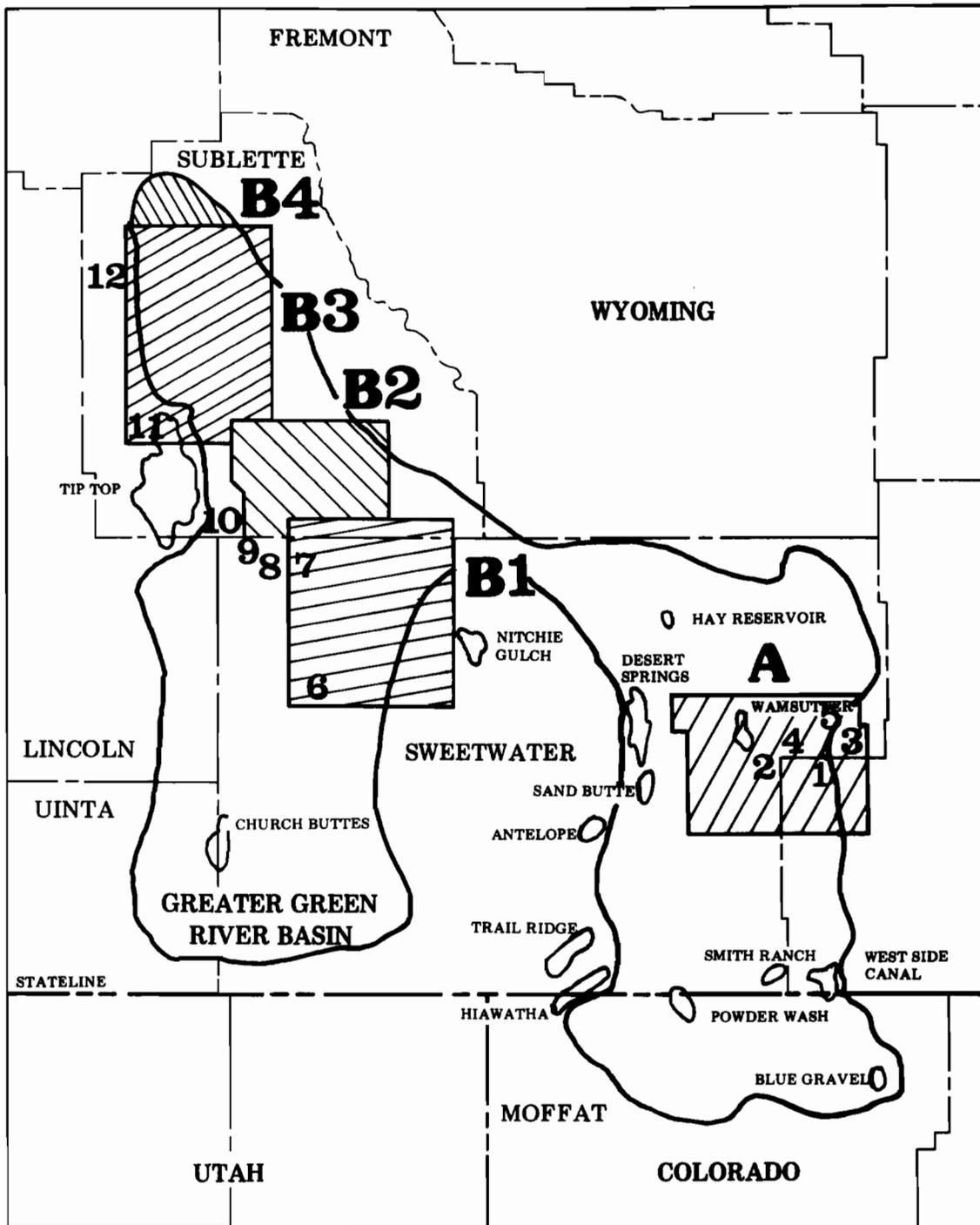


Figure 3-1 USGS Designated Core Areas and Wells of Interest, Greater Green River Basin (refer to Table 3-1)

The major objectives were the Frontier and Bear River Formations in core area B, located in the western part of Wyoming. Forest Oil staked a 16,200 ft Frontier test in area B₁ (Table 3-1 and Figure 3-1) but has not yet spudded. The operator was contacted by CER personnel about possible inclusion of this well in the DOE Core Program, however no agreement was reached at quarter's end. Energetics Inc. completed a well in core area B₂, producing from the commingled Frontier and Bear River Formation and two wells close to areas B₁ and B₂ which have gas production from the Frontier. The area will be monitored closely for future locations by Energetics Inc. to include in the Core Program.

Pacific Transmission Supply has staked a well near area B₃ with excellent coring possibilities. The well is scheduled to test the Frontier at 11,650 ft. DOE is interested in coring parts of the lower Tertiary and Mesaverde sections in this area and a coring contract is under consideration.

3.2 DRILLING ACTIVITY

Sixty-three wells were completed this quarter, a 47 percent increase over second quarter activity. Completed wells accounted for 66,289 MCFD of new gas production from areas and horizons of interest to the WGSP. The most active areas were the Red Desert and Washakie Basins within the Greater Green River Basin. Over the entire basin, 33 exploratory wells were completed with a 45 percent success rate (15 discoveries). Thirty development wells were also completed with 27 being producers (90 percent success rate). Increases in exploratory activity were partially attributable to continuing advances in technology, making it possible to establish commercial production and greater deliverability from tight reservoir sands. Producing horizons were the Ft. Union, Lance, Lewis, Mesaverde Group (Almond and Ericson Formations), Frontier and commingled Frontier/Bear River (Table 3-2). Figure 3-2 is a stratigraphic correlation chart of the Greater Green River, Piceance and Uinta Basins.

Completions in the eastern half of the basin produced from the Cretaceous Mesaverde Group. Active operators were CIG Exploration, Anadarko Production, Sinclair Oil, Getty Oil, Teas O&G, Smokey Oil, Marathon Oil, William Moss Properties and Amoco Production (Table 3-3 and Figure 3-3).

Another principal area of activity was the Moxa Arch. Completions in this western portion of the basin produced gas from the Cretaceous Frontier sandstone and commingled Frontier/Bear River Formations. Active operators were Chevron Oil, Energetics Inc., Belco Petroleum, Davis Oil and Mountain Fuel Supply (Table 3-3, Figure 3-3).

Activity within the WGSP Core Program areas increased significantly over the quarter. During July, 26 new locations were staked which were of interest to the WGSP although most objectives were not deep enough to be of interest to the Core Program. In August, 39 new locations were staked while in September an additional 57 were added. By the end of the quarter drilling was proceeding at 12 of the locations, 9 holes had reached total depth and were shut in, waiting, testing or completed D&A. One additional location had been abandoned without being drilled (Table 3-4, Figure 3-3).

Table 3-1 Summary of Wells Located in USGS Designated Core Areas—Greater Green River Basin¹ (Data as of September 30, 1978)

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 4-22-78 Comp: 6-3-78	Amoco Production	1 Fillmore Creek WI Unit	1	nsw 1/19N/92W Wildcat Field Carbon Cty, WY	Mesaverde	11,655	Acidized - 2,944 gal, 164,660 gal emulsion, 314,200 lb sand	WF, D&A, cored 10,071-10,132	
Spud: 10-22-77 Comp: 7-12-78	Marathon Oil	1-23 Tierney II Unit	2	csw 23/19N/94W Tierney Field Sweetwater Cty, WY	Mesaverde (9,455-9,668)	11,250 PB: 9,721	250,000 gal emul 411,100 lb sand	DG, no tests. Cored 9,473-9,479, 9,479-9,527, 9,846-9,874, 9,874-9,892, 10,848-10,908	970
Spud: 6-10-77 Comp: 7-19-77	Amoco Production	2 Buck Draw	3	csw 17/20N/19W Wildcat Field Sweetwater Cty, WY	Mesaverde	11,140		WF, D&A, cored 10,170-10,230, no tests	
FR: 7-6-78	Amoco Production	1 USA-Amoco T	4	csw 4/20N/93W Five Mile Gulch Field Sweetwater Cty, WY	Mesaverde (10,960)			WO	
Spud: 5-9-78 FR: 4-10-78	Marathon Oil	1-14 Latham*	4	sene 14/20N/93W Wildcat Field Sweetwater Cty, WY	Almond	10,817	150,000 gal emul, 293,000 lb sand	WF, cored 7 intervals in the Ft. Union - Upper Almond	
Spud: 9-30-77 Comp: 7-5-78	Amoco Production	1 Champlin 536 Amoco-A*	5	csw 1/21N/92W Unnamed Field Sweetwater Cty, WY	Ericson (12,530-12,544)	12,640 PB: 12,596	Acidized 1,638 gal 65,000 gal oil, 100,000 lb sand	WFD, no tests, cored 12,050-12,071, 12,071-12,125	536
FR: 7-31-78	Davis Oil	1 Eva-Federal	5	csw 2/21N/92W Wildcat Field Sweetwater Cty, WY	Ericson (12,500)			WF	
FR: 4-6-78	Forest Oil	25-1 Blue Gap II Unit	6	swse 25/22N/107W Wildcat Field Sweetwater Cty, WY	Frontier (16,200)			WF	
Spud: 9-26-78 FR: 8-30-78	Davis Oil	1 Sandy Unit	7	nwse 25/25N/108W Wildcat Field Sweetwater Cty, WY	? (10,800)			WF, drilling 3,385	
Spud: 4-25-76 Comp: 2-23-77	Davis Oil	1 Stanley-Federal*	8	sww 30/25N/109W Unnamed Field Sweetwater Cty, WY	2nd Frontier (10,750-10,764)	11,887 PB: 11,802	Acidized - 5,000 gal-311,300 gal emul; 626,000 lb sand	WFD, 2nd Frontier Discovery—New Field, no cores	93
Spud: 7-20-77 Comp: 6-27-78	Energetics Inc.	32-27 Federal	8	swne 27/25N/110W Swan Field Sweetwater Cty, WY	2nd Frontier (10,398-10,474)	11,511 PB: 10,540	Natural	WOE, cored 10,486-10,535, 11,232-11,272	644
Spud: 3-9-78 Comp: 7-16-78	Energetics Inc.	32-33 Ferguson* Federal	9	swne 33/26N/110W Unnamed Field Sweetwater Cty, WY	Frontier (10,461-10,481)	11,555 PB: 10,675	Acidized - 1,000 gal-75,000 gal emul; 135,000 lb sand	WFD, Frontier Discovery, cored 10,469-10,528	344
Spud: 2-6-78 Comp: 6-21-78	Energetics Inc.	10-19 Federal	10	cnw 19/27N/111W Bird Canyon Field Sublette Cty, WY	Frontier (9,046-9,070) Bear River (9,621-9,644)	9,831 PB: 9,783	Acidized - 2,500 gal, 130,500 gal emul, 166,250 lb sand Acidized - 2,500 gal, 40,000 gal emul, 63,750 lb sand	DG, commingled	348

Table 3-1 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO.²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
FR: 8-11-78	Belco Petroleum	S 29-27 Johnson Ridge	11	swsw 27/30N/113W Big Piney Field Sublette Cty, WY	Mesaverde (3,600)			D	
FR: 9-20-78	Pacific Transmission Supply	24-19 Federal	12	sew 19/33N/114 W Wildcat Field Sublette Cty, WY	Frontier (11,650)			WF	

¹ From Petroleum Information

² Refer to Figure 3-1

* Listed in Table 3-3

Table 3-2 Summary of Drilling Activities, Greater Green River Basin*

	NO. OF WELLS				Total	Producing Horizons in MCFD														Total
	Wildcats		Development			Ft. Union	Lance	Lewis	Undifferentiated	Mesaverde					Frontier	Aspen-Money	Bear River	Commingled		
	D&A	Disc	D&A	Prod.						Almond	Ericson	Rock Springs	Blair	Hillhead						
3rd Quarter 1977	18	13	6	19	56	4,813	0	19,695	18,929+ 25 BC	2,871	0	0	0	0	9,016	0	0	0	53,324+ 25 BC	
4th Quarter 1977	20	13	10	31	74	450	1,026	9,218	19,156	17,001	3,982	0	1,298	0	21,189	0	760	362 ¹	74,442	
1st Quarter 1978	7	5	6	12	30	0	0	1,852	5,385 ⁷	450	0	0	0	0	8,603	400	0	1,500 ²	18,190	
2nd Quarter 1978	7	6	3	27	43	0	0	11,020	14,304	6,994	0	0	0	0	5,179	0	0	4,239 ³	45,595	
3rd Quarter 1978	18	15	3	27	63	449	53	5,504+ 37 BC	16,999+ 69 BC	11,432	536	0	0	0	21,268+ 26 BC	0	0	10,048 ⁵	66,289+ 132 BC	

1. Commingled production - Lewis/Almond - 362 MCFD
2. Commingled production - Lewis/Almond - 1,500 MCFD
3. Commingled production - Frontier/Bear River - 4,239 MCFD
4. IPF not available for 1 producing well
5. Commingled production - Frontier/Bear River - 10,048 MCFD

*Data compiled from P.I. Rocky Mountain Region Report "Completions," October 6, 1977—October 4, 1978.

The principal objectives of the new wells were the Almond and Ericson Formations. The Lewis zone was the target in Hay Reservoir Field, Sweetwater County and in the Great Divide Field, Moffat County, Colorado. In the southern part of the basin, Wexpro Inc. staked a well in Hiawatha Field, Sweetwater County, to test the Ft. Union.

The Hay Reservoir Field, mentioned above, was discovered by Davis Oil two years ago in conjunction with Panhandle Eastern. The field was placed on production for the first time in September with the completion of the gas gathering system. Eleven wells were placed on line at rates between two and three MCFD. Another seven wells were shut in awaiting connection to the gathering system. An additional 22 wells can be drilled in the unit on a 640 acre spacing.

The Lewis pay forms a stratigraphic trap averaging about 40 ft of net pay sand over the unit. Formation porosity is about 10 percent, but permeability is low, about 0.10 millidarcies. All wells are massively fractured using sand with a condensate gel to minimize damage to the water-sensitive Lewis.

Table 3-3 Summary of Wells Completed—Greater Green River Basin¹
(Data as of September 30, 1978)

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 8-29-78 FR: 4-12-78	Northwest Exploration	1 Bruder	1	nene 4/9N/93W Unnamed Field Moffat Cty, CO	Lewis	7,800		WO, perf, prep to frac. Operator has 5 Lewis tests in this locale	
Spud: 11-15-77 Comp: 6-16-78	Energy Reserves Group	3 Klanehammer	2	nene 20/11N/97W Powder Wash Field Moffat Cty, CO	Fort Union (6,740-6,756)	7,400	Fract—no size reported	D, no cores or tests	449
FR: 4-21-78 Spud: 8-14-78	Gary Operating	2-4 Chambers Federal	3	nwnw 2/12N/93W Wildcat Field Carbon Cty, WY	Wasatch	1,788		WF, testing. Operator has 4 Wasatch tests in this locale	
Spud: 6-10-78 FR: 4-20-78	Gary Operating	10-4 Jerry Chambers	3	nwnw 10/12N/93W Smith Ranch Field Carbon Cty, WY	Fort Union	2,277	Acidized 1,000 gal. nitrogen fract	D, SI	
Spud: 6-30-77 Comp: 7-20-77	Martin Oil Services	1-18 Federal	3	nene 18/12N94W Stateline Field Sweetwater Cty, WY	Tertiary (5,792-5,797)	9,875 PB: 9,123		DG	960
Spud: 5-31-78 FR: 6-6-78	Anadarko Production	1 Fireplace Rock Unit	4	sese 16/12N/95W Wildcat Field Sweetwater Ct, WY	Mesaverde Almond Mbr	9,773		WF, testing	
Spud: 7-31-78 FR: 5-3-78	Sinclair Oil	2-1 Grynberg-Federal	5	cne 2/14N/92W Blue Gap Field Carbon Cty, WY	Mesaverde	8,150		D, WOCT	
Spud: 3-19-78 Comp: 7-22-78	Sinclair Oil	3-1 Fair-Federal	5	swne 3/14N/92W Blue Gap Field Carbon Cty, WY	Mesaverde (7,715-9,269)	10,000	84,000 gal gel, 162,000 lb sand	DG, no cores or tests	755 43 BC
Spud: 3-4-75 Comp: 3-8-76	CIG Exploration	6-14-92 Blue Gap II	5	nesw 6/14N/92W Blue Gap Field Carbon Cty, WY	Mesaverde (9,208-9,730)	11,898 PB: 11,846	108,000 gal water 200,000 lb sand	DG	332 4 BC
Spud: 11-4-77 Comp: 5-1-78	Getty Oil	1 SW Robbers Gulch	5	cne 27/14N/92W Unnamed Field Carbon Cty, WY	Mesaverde (8,310-9,047)	9,500 PB: 9,268	112,000 gal gel water, 157,250 lb sand	WFD, Mesaverde Discovery - New Field	1,782
Spud: 1-19-75	CIG Exploration	8-15-92 CIGE	5	nesw 18/15N/92W Unnamed Field Carbon Cty, WY	Mesaverde (8,877-9,408)	11,020 PB: 10,897	323,500 gal water 539,000 lb sand	WFD, no cores, Mesaverde Discovery	994 40 BO
Spud: 1-5-78 Comp: 6-22-78	Sinclair Oil	23-1 Hamilton Federal	5	sese 23/15N/92W Blue Gap Field Carbon Cty, WY	Mesaverde (8,801-7,624)	9,450 PB: 8,650	192,000 gal emul 437,000 lb sand	DG, no cores or tests	5,100
Spud: 9-1-77 Comp: 9-5-78	Texas O&G	1 Windmill Draw	7	nwse 14/15N/94W Unnamed Field Sweetwater Cty, WY	Almond (11,566-11,606)	12,576	Acidized - 1,500 gal, 169,932 gal emul, 310,000 lb sand	WFD, Almond Discovery	877

Table 3-3 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 6-23-78 Comp: 7-16-78	Jerry Chambers	1-20 Scheggs Draw Federal	6	sese 20/15N/101W Wildcat Field Sweetwater Cty, WY	Blair	6,000		WF, D&A	
Spud: 6-19-77 Comp: 7-31-78	Amoco Production	2 Salazar Unit	7	senw 11/16N/95W Salazar Field Sweetwater Cty, WY	Almond (12,150-12,320)	12,700 PB: 12,506	Acidized - 5,166 gal-124,656 gal gel, 228,114 lb sand	WOE, no cores or tests, Almond extension	431
Spud: 6-1-78 FR: 5-5-78	Smokey Oil	2-12 King Resources Federal	8	csw 12/16N/98W Wildcat Field Sweetwater Cty, WY	Mesaverde	13,800		WF, WOCT	
Spud: 3-31-76 Comp: 4-3-78	Davis Oil	1 North Fork-Federal	8	csw 14/17N/97W Unnamed Field Sweetwater Cty, WY	Lance (9,204-9,216)	13,560 PB:	Acidized - 15,800 gal, 127,000 lb sand, 49,700 gal gel	WFD, Lance Discovery - no cores or tests	53
Spud: 12-3-77 Comp: 7-28-78	Mountain Fuel Supply	26 Unit	9	nwnw 35/17N/12W Church Buttes Field Sweetwater Cty, WY	Frontier (12,069-12,093)	12,830 PB: 12,538	Acidized - 10,000 gal, 208,000 gal gel, 390,000 lb sand	DG	2,375
Spud: 11-16-77 Comp: 6-30-78	Marathon Oil	1-2 Standard Draw-Federal	10	nesw 2/18N/93W Standard Draw Field Carbon Cty, WY	Almond (8,671-9,108)	9,644	188,000 gal gel, 256,000 lb sand	WFD, Almond Discovery	5,800
Spud: 1-29-78 FR: 10-28-77	William Moss Properties	20-18-93 Federal	10	csw 20/18N/93W Unnamed Field Carbon Cty, WY	Mesaverde (8,983-9,445)	9,939 PB: 9,445	Acidized - 15,000 gal, 52,500 gal water, 97,170 lb sand	WFD, Mesaverde Discovery, no cores	668 12 BC
Spud: 1-30-78 Comp: 5-9-78	Mountain Fuel Supply	8 Unit	9	senw 8/18N/112W Bruff Field Uinta Cty, WY	Frontier (11,492-11,522)	11,700 PB: 11,622	208,000 gal emul 354,000 lb sand	DG, no cores	1,605
Spud: 10-22-77 Comp: 7-12-78	Marathon Oil	1-23 Tierney II Unit	11	csw 23/19N/94W Tierney Field Sweetwater, Cty, WY	Mesaverde (9,455-9,668)	11,250 PB: 9,721	250,500 gal emul 411,100 lb sand	DG, no tests, cored 9,473-10,808	970
Spud: 3-30-78 Comp: 5-10-78	Mountain Fuel Supply	9 Unit	9	senw 22/18N/112W Bruff Field Uinta Cty, WY	Frontier (11,744-11,792)	11,900 PB: 11,804	220,000 gal emul 365,000 lb sand	DG, no cores	3,676
Spud: 3-14-78 Comp: 5-11-78	Mountain Fuel Supply	10 Unit	9	nene 23/19N/112W Bruff Field Sweetwater Cty, WY	Frontier (11,481-11,513)	11,670 PB: 11,575	136,500 gal emul 239,000 lb sand	DG	1,049
Spud: 5-9-78 FR: 4-10-78	Marathon Oil	1-14 Latham*	11	sese 14/20N/93W Wildcat Field Sweetwater Cty, MT	Almond	10,817	150,000 gal emul 293,000 lb sand	WF, cored 7 intervals in the Ft. Union-Upper Almond	
Spud: 5-29-78 Comp: 8-28-78	Amoco Production	1 Champlin 441 Amoco-A	12	cse 21/20N/95W Wamsutter Field Sweetwater Cty, WY	Almond (9,216-9,229)	9,741 PB: 9,290	Acidized - 1,680 gal-105,000 gal water, 160,520 lb sand	WOE, Almond Extension - Wamsutter Field, cored 9,085-9,127, no tests	674 3 BO

Table 3-3 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 9-30-77 Comp: 7-5-78	Amoco Production	1 Champlin 536 Amoco-A*	13	csw 1/24N/92W Unnamed Field Sweetwater Cty, WY	Ericson (12,530-12,544)	12,640 PB: 12,596	Acidized - 1,638 gal-65,000 gal oil, 100,000 lb sand	WFD, no tests, cored 1,2050- 12,125	536
Spud: 1-14-78 Comp: 5-26-78	Marathon Oil	1-36 West Wamsutter	12	nwse 36/21N/95W Wamsutter Field Sweetwater Cty, WY	Lewis (8,304-8,326)	8,420 PB:	73,000 gal water 135,000 lb sand	DG, within core site	2,244 18 BC
Reentered: 8-18-77 Comp: 3-28-78	Texas O&G	1 Federal-H	14	cne 18/22N/95W Wildcat Field Sweetwater Cty, WY	Lewis (9,903-9,921)	12,068 PB: 10,200	Acidized - 2,750 gal-76,762 gal gel, 100,786 lb sand	WFD, no cores or tests. Lewis Discovery, old info: Spud:6-6-76 Comp: D&A 8-10-76, WF, perfed, testing	175 19 BC
Spud: 6-27-78 FR: 4-13-78	Woods Petroleum	1 Steamboat Mtn. Unit	15	senw 3/23N/102W Wildcat Field Sweetwater Cty, WY	? (12,500)	13,044			
Spud: 4-21-77 Comp: 10-10-77	Davis Oil	9 Unit	16	nwse 17/23N/111W Storm Shelter Field Sweetwater Cty, WY	2nd Frontier (10,324-10,352)	10,650 PB: 10,552	210,020 gal emul 430,000 lb sand	DG, cored 10,323-10,383	1,810 26 BC
Spud: 5-23-78 Comp: 7-29-78	Davis Oil	1 Five Fingers Unit	17	swne 14/25N/98W Wildcat Field Sweetwater Cty, WY	Mesaverde	13,005		WF, D&A	
Spud: 4-25-76 Comp: 2-23-77	Davis Oil	1 Stanley- Federal*	18	sww 30/25N/109W Unnamed Field Sweetwater Cty, WY	2nd Frontier (10,750-10,764)	11,887 PB: 11,802	Acidized - 5,000 gal-311,300 gal emul, 626,000 lb sand	WFD, 2nd Frontier Dis- covery, no cores, large frac	93
Spud: 3-9-78 Comp: 7-16-78	Energetics Inc.	32-33 Ferguson Federal*	18	swne 33/26N/110W Unnamed Field Sweetwater Cty, WY	Frontier (10,461-10,481)	11,555 PB: 10,675	Acidized - 1,000 gal-75,000 gal emul, 135,000 lb sand	WFD, Frontier Discovery, cored 10,469-10,528	344
Spud: 2-6-78 Comp: 6-18-78	Belco Petroleum	5-14 Unit	19	nene 14/26N/112W Stead Canyon Field Lincoln Cty, WY	2nd Frontier (7,903-8,064)	8,166 PB: 8,100	52,250 gal emul 123,000 lb sand	DG, no cores or tests	175
Spud: 2-6-78 Comp: 6-21-78	Energetics Inc.	10-19 Federal	19	cnw 19/27N/111W Bird Canyon Field Sublette Cty, WY	Frontier (9,046-9,070)	9,831 PB: 9,783	Acidized - 2,500 gal-130,500 gal emul, 166,250 lb sand.	DG, commingled	348
					Bear River (9,621-9,644)		Acidized - 2,500 gal-40,000 gal emul, 63,750 lb sand		
Spud: 4-20-78 Comp: 8-3-78	Belco Petroleum	25-5 Unit	20	nwse 5/27N/113W North LaBarge Sublette Cty, WY	Frontier (6,263-6,972)	7,086 PB: 7,048	Acidized - 2,000 gal-98,000 gal emul, 210,000 lb sand	DG, no cores or tests	1,195
Spud: 12-18-77 Comp: 4-10-78	Chevron Oil	98 Unit	20	nenw 25/27N/113W Birch Creek Field Sublette Cty, WY	Frontier (6,670-6,856) Bear River (7,506-7,582)	7,675 PB: 7,619	299,100 gal water 673,000 lb sand	DG, no cores or tests, commingled	1,700

Table 3-3 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 1-19-78 Comp: 4-19-78	Chevron Oil	99 Unit	20	swne 26/27N/113W Birch Creek Field Sublette Cty, WY	Frontier (6,670-6,782) Bear River (7,480-7,513)	7,650 PB: 7,594	755,000 gal water 755,000 lb sand	DG, no cores or tests	8,000
Spud: 3-20-78 Comp: 6-15-78	Mobil Oil	F44-7G Unit TR 14	20	ene 7/28N/113W Tip Top Field Sublette Cty, WY	Frontier (6,372-7,464)	7,550 PB: 7,512	Acidized - 1,000 gal- 136,720 gal water, 300,000 lb sand	DG	4,660

¹ From Petroleum Information

² Refer to Figure 3-2

*Listed in Table 3-1

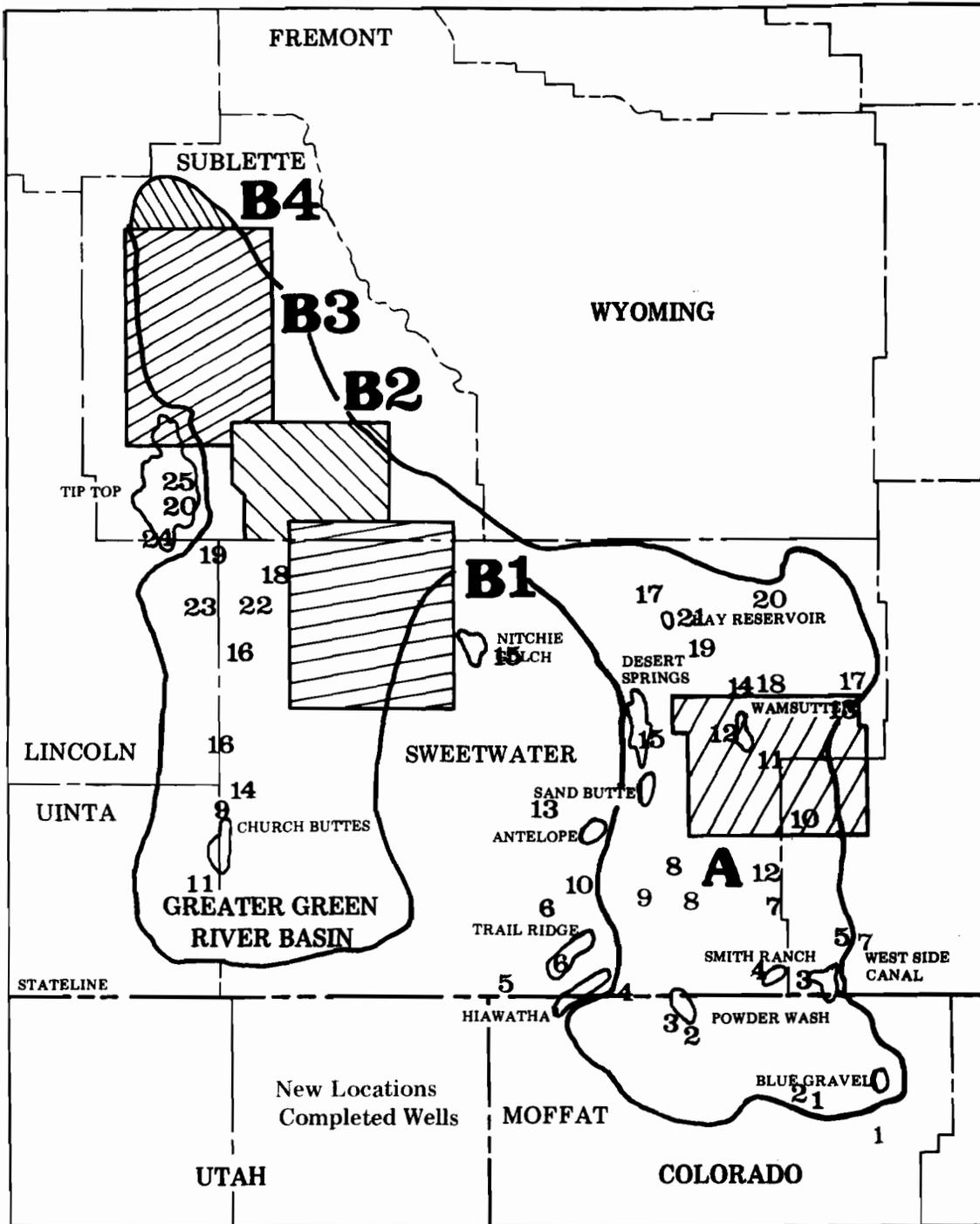


Figure 3-3 Wells Completed and Staked, USGS Designated Core Areas, Greater Green River Basin (refer to Tables 3-3 and 3-4)

Table 3-4 Summary of New Wells—Greater Green River Basin¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO ²	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 9-5-78	Energy Reserves Group	1 Van Dorn	1	swsw 29/7N/90W Wildcat Field Moffat Cty, CO	Mesaverde (4,800)	WF
FR: 6-23-78	Sun Gas	29-1 Federal-Fox	1	nwnw 29/8N/90W North Craig Field Moffat Cty, CO	Lance (3,800)	D
FR: 7-5-78	CIG Exploration	1-2-8-91 Vintainer Sheep	1	nesw 2/8N/91W Blue Gravel Field Moffat Cty, CO	? (5,200)	WO, @ 4,775, running logs
FR: 9-20-78	Northwest Exploration	1 Wilson	2	nene 3/9N/93W Great Divide Field Moffat Cty, CO	Lewis (8,150)	D, Operator has 7 new Lewis tests in this locale
FR: 9-12-78	Sun Gas	1-16 State	2	cne 16/9N/93W Great Divide Field Moffat Cty, CO	Lewis (8,000)	WO
FR: 8-4-78	Northwest Exploration	1 Natural Resources	2	nesw 28/10N/93W Great Divide Field Moffat Cty, CO	Mesaverde (8,350)	WO
FR: 8-21-78	Sun Oil	1-34 Mar-Win Little	2	nene 34/10N/93W Great Divide Field Moffat Cty, CO	? (9,150)	WO, drilling, no depth reported, Operator has 2 new Mesaverde tests in this locale
FR: 7-17-78 Spud: 9-16-78	Energy Reserves Group	3 Federal	3	nenw 18/11N/97W Powder Wash Field Moffat Cty, CO	? (7,600)	D, drilling 6,115, Operator has 3 new 7,600 ft tests in this locale
FR: 9-11-78	Wexpro	17-2 MFS-Federal	4	sese 17/12N/99W Hiawatha Field Sweetwater Cty, WY	Ft. Union (5,425)	D
FR: 8-28-78	Energy Reserves Group	1 Federal-2	5	sww 2/12N/103W Middle Mtn Field Sweetwater Cty, WY	Wasatch (5,550)	WS, Operator has 2 new Wasatch tests in this locale
FR: 6-20-78	Oil Development of Texas	16-34 Unit	6	sww 34/13N/101W Canyon Creek Field Sweetwater Cty, WY	Lewis (4,420)	D, Operator has 4 new Lewis tests in this locale
FR: 9-14-78	Trigg Drilling	1-18 State of Wyoming	7	swse 18/14N/91W Robbers Gulch Field Carbon Cty, WY	Mesaverde (9,300)	D
FR: 8-9-78	Getty Oil	11-23 Robbers Gulch	7	nesw 23/14N/92W Robbers Gulch Field Carbon Cty, WY	Mesaverde (9,775)	D
FR: 8-8-78	Sinclair Oil	34-1 Hamilton-Federal	7	nese 34/15N/92W Blue Gap Field Carbon Cty, WY	Mesaverde (8,900)	D, Operator has 2 new Mesaverde tests in this locale
FR: 6-12-78 Spud: 8-14-78	Koch Exploration	1 Adobe Town Unit	8	swse 20/15N/97W Wildcat Field Sweetwater Cty, WY	Mesaverde (17,500)	WF, drilling 12,519, close to core area A

Table 3-4 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO ²	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 9-21-78	Smokey Oil	3-18 Bluewater Federal	9	cne 18/15N/99W Wildcat Field Sweetwater Cty, WY	Mesaverde (13,500)	WF
Spud: 6-23-78	Jerry Chambers	1-20 Scheggs Draw	10	sese 20/15N/101W Wildcat Field Sweetwater Cty, WY	Mesaverde	WF, drilling 1,524 ft
FR: 9-21-78	Diamond Shamrock	1 Hank Unit	11	swne 20/15N/118W Wildcat Field Uinta Cty, WY	Dakota (13,400)	WF
Spud: 5-12-78	CIG Exploration	1-23-16-94 Federal	12	s1/2se 23/16N/94W Wildcat Field Sweetwater Cty, WY	Mesaverde (11,400)	WF, drilling 10,100 ft, Operator has 2 Mesaverde tests in this locale
FR: 7-18-78 Spud: 9-27-78	Amoco Production	2 Unit	9	csw 23/16N/99W Bitter Creek Field Sweetwater Cty, WY	Mesaverde (12,100)	D, drilling 813 ft
FR: 7-25-78 Spud: 9-17-78	Sinclair Oil	1-6 Federal	12	csw 6/17N/93W Wild Rose Field Carbon Cty, WY	Mesaverde (10,100)	D, drilling 5,400 ft, Operator has 2 new Mesaverde tests in this locale
FR: 8-1-78	St. Michael Exploration	1-36 State	13	sene 36/18N/100W Wildcat Field Sweetwater Cty, WY	Almond (4,200)	WF, Operator has 2 Ericson tests (4,850) in this locale
FR: 9-14-78	Amoco Production	1 Champlin 149 Amoco H	14	nwnw 3/18N/112W Bruff Field Uinta Cty, WY	Frontier (11,600)	D, Operator has 4 new Frontier tests in this locale
FR: 4-25-78 Spud: 9-2-78	Amoco Production	1 Champlin 285 Amoco B	14	sesw 3/19N/112W Wildcat Field Lincoln Cty, WY	Frontier (11,486)	WF, @ 11,295 ft, prep to core, Operator has 9 Frontier tests in this locale
FR: 8-29-78	Mobil Oil	T66-16-S A Gilbert	15	nese 16/20N/98W Desert Springs Sweetwater Cty, WY	Mesaverde (6,100)	D
FR: 8-1-78 Spud: 9-7-78	Marathon Oil	1-34 Fabian Ditch	16	csw 34/20N/112W Fabian Ditch Field Lincoln Cty, WY	Frontier (11,570)	D, drilling 8,803 ft
FR: 7-11-78	Cotten Petroleum	18-1 Hammond-Federal	15	e1/2sw 18/21N/94W Siberia Ridge Field Sweetwater Cty, WY	Mesaverde (10,600)	D
FR: 3-31-78	Amoco Production	21 Unit	16	nesw 9/21N/112W Whiskey Buttes Field Lincoln Cty, WY	Frontier (11,216)	D, Operator has 12 Frontier tests in this locale
FR: 9-14-78	Amoco Production	1 Champlin 536 Amoco C	17	csw 31/22N/91W Unnamed Field Sweetwater Cty, WY	Mesaverde (13,100)	WO, Operator has 2 Mesaverde tests in this locale
FR: 9-26-78	Pacific Transmission Supply	3-26 Federal	18	e1/2sw 26/22N/94W Siberia Ridge Field Sweetwater Cty, WY	Mesaverde (11,400)	D

Table 3-4 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO ²	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 9-1-78	Davis Oil	37 Hay Reservoir	19	senw 6/23N/96W Hay Reservoir Field Sweetwater Cty, WY	Lewis	D, Operator has 4 new Lewis tests in this locale
FR: 9-28-78	Michigan Wisconsin Pipeline	1-27 McKnight	20	nwse 27/24N/93W Wildcat Field Sweetwater Cty, WY	Mesaverde (14,550)	WF
FR: 9-21-78	Davis Oil	2 Bush Lake Unit	21	senw 16/24N/96W Bush Lake Field Sweetwater Cty, WY	Mesaverde (13,500)	D, Operator has 2 new Mesaverde tests in this locale
FR: 8-14-78 Spud: 9-15-78	Davis Oil	1 Rigby Road Unit	21	nwnw 14/24N/98W Wildcat Field Sweetwater Cty, WY	Almond (10,500)	WF, drilling 8,802 ft
FR: 7-6-78	Davis Oil	3 Horn Canyon Unit	22	swnw 9/24N/110W Unnamed Field Sweetwater Cty, WY	Dakota (11,500)	WO, @ 11,760 ft, prep to run production casing
FR: 8-7-78	Northwest Exploration	1 Fontenelle	23	cse 12/24N/112W Wildcat Field Lincoln Cty, WY	10,600 test	WF
FR: 9-15-78	Texas Oil & Gas	1 Federal 477	21	csw 21/25N/96W Unnamed Field Sweetwater Cty, WY	Rock Springs (14,300)	WO
Spud: 5-23-78	Davis Oil	1 Five Fingers Unit	21	swne 14/25N/98W Wildcat Field Sweetwater Cty, WY	Mesaverde (13,000)	WF, drilling 10,636 ft, Operator has 3 deep Mesaverde tests in this locale
FR: 8-3-78 Spud: 8-25-78	Woods Petroleum	1 Lost Valley Unit	21	senw 17/25N/98W Wildcat Field Sweetwater Cty, WY	Baxter (14,186)	WF, drilling 3,385 ft
FR: 8-11-78	Pacific Transmission Supply	23-1 Federal	23	nesw 1/25N/112W Fontenelle Field Lincoln Cty, WY	Frontier (8,770)	D, Operator has 3 new Frontier tests in this locale
FR: 9-27-78	John J. Christmann	3-28 Red Gap	24	nenw 28/26N/113W South Hogsback Field Lincoln Cty, WY	Frontier (8,600)	D
FR: 9-27-78	J. B. Roden	5-4 Tartar's Island Unit	24	nenw 4/27N/112W Tartar's Island Field Sublette Cty, WY	Mesaverde (3,500)	D
FR: 9-11-78	Western Oil Refining	14-9 Federal	24	sww 9/27N/113W North LaBarge Field Sublette Cty, WY	Mesaverde (2,300)	D
FR: 6-2-78	Belco Petroleum	20-34 Chimney Buttes Unit	25	nenw 34/28N/113W Big Piney Field Sublette Cty, WY	Frontier (7,800)	D, Operator has 6 Frontier tests in this locale

¹ From Petroleum Information
² Refer to Figure 3-2

4. Uinta Basin

4.1 CORE PROGRAM

The Uinta Basin is located in northeastern Utah (Figure 4-1) and has potential production from "tight gas sands" in a thick section of Upper Cretaceous through Tertiary sediments. Cretaceous tight horizons include the Castlegate and Sego sandstones and the Blackhawk, Price River, Neslen and Farrer Formations. In the Tertiary, tight gas sands are found in the Tuscher, North Horn, Wasatch and Green River Formations.

Areas recommended by the USGS for the acquisition of core for the WGSP Core Program are listed below (see Figure 4-1).

Area A

Wasatch and Duchesne Counties—T4S to T7S, R5W to R11W; in Wasatch County, T9S to T11S, R7, 8, and 9E; in Carbon County, T11S to T12S, R7E to R13E.

Area B

Duchesne and Uintah Counties—T3S to T4S, R2E to R2W and parts of T8S, R16E to R18E.

Area C

Uintah County—T8S and T9S and R23, 24, and 25E.

Area D

Uintah and Grand Counties—T10S, R18E, T11S to T16S, R18E to R25E; and in T17S, T18S, and T19S, R21E and R22E.

These areas were selected due to their lack of core and well data and location outside the main productive fields of the Uinta Basin. Activity is concentrated in and around the Natural Buttes and Red Wash Fields, where production is primarily from the Green River and Wasatch Formations and Mesaverde Group.

New locations staked within the core areas are closely monitored so that the operators can be contacted concerning possible participation in the Core Program.

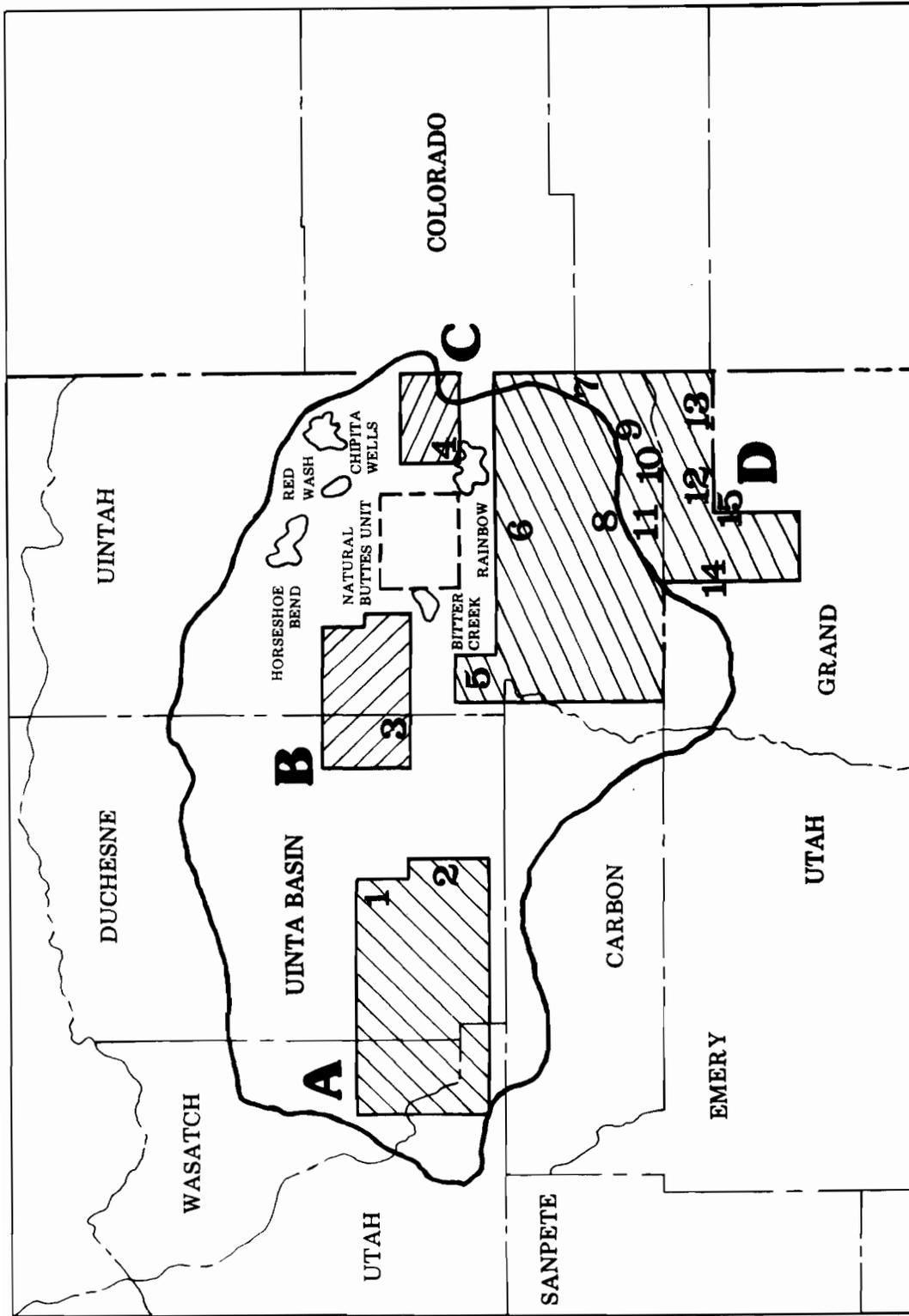


Figure 4-1 USGS Designated Core Areas and Wells of Interest, Uinta Basin (refer to Table 4-1)

Between July and September, 1978, the operators listed below were contacted:

Anschutz Corporation, Denver, Colorado
Chorney Oil, Denver, Colorado
Continental Oil, Denver, Colorado
CSV Exploration, Salt Lake City, Utah
Exxon - Western Division, Denver, Colorado
Gulf Oil, Casper, Wyoming
Mapco, Billings, Montana
Moncrief Oil, Casper, Wyoming
Natural Gas Corporation of California, San Francisco, California
Odessa Natural Corporation, Odessa, Texas
Pacific Transmission Supply, Casper, Wyoming
Palmer Oil and Gas, Billings, Montana
Phoenix Resources, Denver, Colorado
Taiga Energy, Denver, Colorado

No coring agreements were reached during this quarter.

Gulf Oil and Moncrief were the most active operators within the core areas. Between them, 18 tests were staked south of the Altamont Field area; the Wasatch was the known primary objective in 14 of the wells. The most important new location was Odessa Natural's 18-1 Sowers Canyon Unit in Section 18, T6S, R5W (USM). The well is a deep test scheduled to penetrate the entire Mesaverde section in a little-drilled area of Duchesne County.

Table 4-1 is summary of wells located within the core areas. These wells are located on Figure 4-1.

4.2 DRILLING ACTIVITY

Twelve wells were completed during the third quarter of 1978 in the Upper Cretaceous and Tertiary horizons of concern to the WGSP. Four of the 12 wells were wildcats, a 100 percent increase over the second quarter, but only one of the wildcats was a discovery, finding a new Mancos B field in Uintah County. All eight of the development wells completed proved productive.

Although the number of wells completed during the third quarter was down six from the second quarter, new production was nearly 20 percent greater, totalling 24,962 MCFD. Commingled production from the Wasatch and Mesaverde accounted for 15,742 MCFD of the third quarter's total, well above the 750 MCFD tallied during the second quarter. There was a corresponding fall off in single completions of the Wasatch, from 19,411 MCFD in the second quarter to 4,214+ in the third quarter. The above figures would seem to indicate that although Mesaverde production is not economic by itself, it can be a significant factor increasing the productivity over that of a normal Wasatch completion. These results are summarized in Table 4-2.

Table 4-1 Summary of Wells Located in USGS Designated Core Areas—Uinta Basin¹
(Data as of September 30, 1978)

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IFF in MCFD
Spud: 3-11-78 FR: 7-6-77	W. A. Moncrief	15-1 Gulf Tribal	1	nene 15/4S/6W (USM) Wildcat Field Duchesne Cty, UT	Confidential test	13,062 PB: 8,150		WF, perf, testing. Operator has 1 additional un- named test in this locale drilling	
Spud: 6-15-78 FR: 5-15-78	Gulf Oil	1-22 B 1 Ute Tribal	1	nwne 22/4S/6W (USM) Wildcat Field Duchesne Cty, UT	Wasatch	7,470	Acidized - 3,000 gal	WF, swbg, Operator has 15 additional Was- atch tests and a Green River test in this locale	
Spud: 5-18-78 Comp: 7-18-78	Gulf Oil	1-11 Neilsen-Ute*	1	nwse 11/5S/6W (USM) Indian Canyon Field Duchesne Cty, UT	Green River (3,217-3,778)	4,050 PB: 3,810	Acidized - 6,200 gal-fract	DG, no cores or tests	452
FR: 9-8-78	Odessa Natural	18-1 Sowers Canyon Unit	1	senw 18/6S/5W (USM) Wildcat Field Duchesne Cty, UT	Mesaverde (15,400)			WF	
Spud: 10-10-77 FR: 6-9-77	Phoenix Resources	22-1 Wolf Hollow	2	sww 22/6S/5W (USM) Wildcat Field Duchesne Cty, UT	Wasatch	5,183	81,300 gal foam, 48,000 lb sand, Acidized	WF, SI	
Spud: 3-1-78 FR: 12-28-78	Pacific Transmission Supply	32-29 PTS Federal	3	swne 29/8S/17E (SLM) Wildcat Field Duchesne Cty, UT	Castlegate	14,245 PB: 6,600		WF, perf, prep to frac	
Spud: 2-23-78 FR: 1-11-78	Pacific Transmission Supply	23-11 Sand Ridge Unit	4	nesw 11/9S/23E (SLM) Natural Buttes Field Uintah Cty, UT	Mesaverde	7,400		D, MICT	
FR: 1-9-78	Continental Oil	13 Chapita Federal	4	sese 13/9S/23E (SLM) Natural Buttes Field Uintah Cty, UT	Mesaverde (8,749)			D, Operator has additional Mesa- verde tests in this locale	
Spud: 1-19-78 FR: 12-23-78	Pacific Transmission Supply	41-9 Devil's Playground	4	nene 9/9S/24E (SLM) Natural Buttes Field Uintah Cty, UT	Castlegate	6,470	Acidized - 3,500 gal	WO, F 24 MCFD, SI	
FR: 4-26-78	Mapco, Inc.	4-11 DRBU [†]	5	swnw 11/10S/18E (SLM) Uteland Butte Field Uintah Cty, UT	Mesaverde (8,455)			D, Operator has 12 additional Mesaverde tests in this locale	
Spud: 3-8-78 FR: 1-20-78	Amoco Production	1 Buck Camp	6	nene 22/12S/22E (SLM) Wildcat Field Uintah Cty, UT	Mississippian (15,000)			WF, cored 13,659- 13,718, no tests, D&A	
FR: 4-6-78	Exxon	2 Crooked Canyon	6	nwne 34/13S/23E (SLM) Wildcat Field Uintah Cty, UT	Morrison (9,150)			WF	

Table 4-1 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 1-3-77 FR: 11-9-78	Taiga Energy	1 Dry Burn Unit	7	nwse 29/13S/25E (SLM) Wildcat Field Uintah Cty, UT	Mancos	5,796		WF, perf, WOE. Operator has an additional Mancos test in this locale	
Spud: 10-9-77 Comp: 1-21-78	Exxon USA	1 Pine Spring Unit	8	nesw 15/14S/22E (SLM) Wildcat Field Uintah Cty, UT	Dakota (9,126-9,192)	9,700	63,000 gal emul, 150,750 lb sand, 39,350 gal gel - Acidized - 3,000 gal	WFD, Dakota Discovery - New Field, no cores	495
FR: 7-25-78	Taiga Energy	1 Sweetwater Canyon	9	swnw 14/14S/24E (SLM) Unnamed Field Uintah Cty, UT	Dakota (5,920)			WD	
Spud: 11-23-77 Comp: 4-14-78	Taiga Energy	1-L-23 Federal*	9	swne 23/14S/24E (SLM) Unnamed Field Uintah Cty, UT	Mancos B (5,416-5,804)	5,903 PB: 5,855	Acidized - 2,000 gal-61,970 gal emul, 216,000 lb sand	WFD, Mancos B Discovery - New Field	288
FR: 6-21-78	Taiga Energy	3 Rat Hole Canyon	7	senw 9/14S/25E (SLM) Unnamed Field Uintah Cty, UT	Mancos (4,950)			WO, Operator has 2 additional Mancos tests in this locale	
Spud: 7-15-78 FR: 4-17-78	Taiga Energy	14-16 Main Canyon Unit	10	nenw 16/15S/23E (SLM) Wildcat Field Uintah Cty, UT	Navajo (9,320)			WF, @4,564, reaming	
FR: 6-21-78	Taiga Energy	3 Black Horse Canyon	10	nesw 9/15S/24E (SLM) Wildcat Field Uintah Cty, UT	Mancos (6,100)			WF	
Spud: 5-28-78 Comp: 7-30-78	Exxon, USA	1 Wolf Point Unit	11	sese 2/15S/21E (SLM) Wildcat Field Uintah Cty, UT	Wasatch (10,308)			WF, D&A	
FR: 6-13-78	Anschutz Corp.	1 State-920	11	nws 28/16S/21E (SLM) Segundo Canyon Grand Cty, UT	Morrison (9,930)			D	
Spud: 2-28-78 FR: 1-11-78	Anschutz Corp.	921-1 Ten Mile-State	11	nenw 34/16S/21E (SLM) Segundo Canyon Grand Cty, UT	Mancos (8,850)			WS, SDW @ 300	
FR: 6-13-78	Anschutz Corp.	1 State-915	12	nwnw 17/16S/22E (SLM) Unnamed Field Grand Cty, UT	Entrada (10,500)			WD, Operator has 1 additional Entrada test in this locale	
FR: 9-1-78	Natural Gas Corp. of California	1-20 Federal	13	nws 20/16S/25E (SLM) San Arroyo Field Grand Cty, UT	Morrison (6,500)			D, Mesaverde on surface	
FR: 9-11-78	Palmer O&G	6-14 Federal	13	swse 6/16S/26E (SLM) San Arroyo Field Grand Cty, UT	Morrison (5,200)			WO, Mesaverde on surface	

Table 4-1 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
FR: 4-17-78	Palmer O&G	16-4 State	13	nene 16/16S/26E (SLM) San Arroyo Field Grand Cty, UT	Salt Wash (4,970)			D, Mesaverde on surface	
FR: 9-30-77	Anschutz Corp.	1 State-402	14	swne 36/17S/20E (SLM) Wildcat Field Grand Cty, UT	Dakota (9,400)			WF	
FR: 6-13-77	Anschutz Corp.	1 State-404	15	nenw 23/17S/21E (SLM) Segundo Canyon Grand Cty, UT	Morrison (8,900)			WO	
FR: 10-1-76	Anschutz Corp.	1-414 State	15	seaw 32/18S/21E (SLM) Wildcat Field Grand Cty, UT	Entrada (8,000)			WF, Operator has an additional Entrada test in this locale	

¹ From Petroleum Information

² Refer to Figure 4-1

* Listed in Table 4-3

† Listed in Table 4-4

Table 4-2 Summary of Drilling Activities, Uinta Basin *

	NO. OF WELLS				Total	Producing Horizons in MCFD											Total
	Wildcats		Development			Utaha	Green River	Wasatch	Mesaverde					Mancos B	Commingled		
	D&A	Disc	D&A	Prod.					Undifferentiated	Pice River	Black Hawk	Star Point	Mancos				
3rd Quarter 1977	5	2	1	8	16	0	not available	12,611	0	0	0	0	0	0	0	0	12,611
4th Quarter 1977	4	0	2	14	20	0	0	21,901	1,850	0	0	0	0	0	0	1,400 ¹	25,151
1st Quarter 1978	5	1	0	6	12	0	0	8,182	0	0	0	0	0	0	0	0	8,182
2nd Quarter 1978	1	1	1	15	18	0	0	19,411	329	0	0	0	314	0	750 ²	20,804	
3rd Quarter 1978	3	1	0	8	12	0	1,800	4,214 ⁴	2,918	0	0	0	0	288	15,742 ³	24,962	

1. Commingled production - Wasatch/Mesaverde - 1,400 MCFD

2. Commingled production - Wasatch/Mesaverde - 750 MCFD

3. Commingled production - Wasatch/Mesaverde - 15,742 MCFD

4. IPF not available for one producing well

*Data compiled from P.I. Rocky Mountain Region Report "Completions," October 6, 1977—October 4, 1978.

A majority of the quarter's exploratory and development activities was located near the Altamont Field in Duchesne County and in the Natural Buttes area of Uintah County. Moncrief and Gulf had staked and were drilling a number of Wasatch tests near Altamont while Belco, Mapco, CIGE, GPE and Enserch carried out Wasatch and Mesaverde tests in the Natural Buttes Unit.

Drilling and leasing activity expanded during the quarter in the Natural Buttes area of Uintah County. Active firms drilled tests ranging from 5,000 to 10,000 ft. The gas production in the area is primarily from the Green River, Wasatch, Mesaverde and Mancos. Belco Petroleum was one of the most active companies in the area.

Low deliverability wells is a problem operators encounter in the Natural Buttes area. A test may demonstrate an initial potential of two to three MMCFD, but after producing for a short time, it generally drops to a fairly steady production of a few hundred MCFD.

Summaries of completed wells and new wells appear in Tables 4-3 and 4-4 respectively. Figure 4-3 shows the location of completed wells with green numbers and gives new locations during this quarter with orange numbers.

Table 4-3 Summary of Wells Completed—Uinta Basin¹
(Data as of October 4, 1978)

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 6-15-78 FR: 5-15-78	Gulf Oil	1-22 B 1 Ute Tribal*	1	nwne 22/4S/6W (USM) Wildcat Field Duchesne Cty, UT	Wasatch	7,470	Acidized - 3,000 gal	WF, Swbg	
Spud: 5-18-78 Comp: 7-18-78	Gulf Oil	1-11 Neilsen-Ute*	1	nwse 11/6S/6W (USM) Indian Canyon Field Duchesne Cty, UT	Green River (3,217-3,778)	4,050 PB:	Acidized - 6,200 gal fract	WD, no cores or tests	452
FR: 5-5-78	Jerry Chambers	1-4 Horseshoe Bend Field Federal	2	4/7S/21E (USM) Horseshoe Bend Field Uintah Cty, UT	Uinta (3,600)			D, abandoned location	
Spud: 2-7-78 Comp: 6-4-78	Chevron Oil	USA 243 (42-18C) Red Wash Unit	3	sene 18/7S/24E (SLM) Red Wash Field Uintah Cty, UT	Green River (5,212-5,298)	5,800 PB: 5,400	Acidized - 3,700 gal-30,000 gal water, 30,000 lb sand	DG, no cores or tests	913
Spud: 7-18-78 FR: 7-25-78	Pacific Transmission Supply	44-36 State	4	sese 36/8S/5E (SLM) Wildcat Field Duchesne Cty, UT	Wasatch	7,120		WF, perfed, prep to frac	
Spud: 4-13-78 FR: 3-7-78	Gulf Oil	2 Uinta Test	5	nwsW 16/8S/21E (SLM) Red Wash Field Uintah Cty, UT	Uinta	1,700		WS, SI, Operator has 2 additional Uinta tests in this locale	
Spud: 6-13-78 FR: 4-18-78	Continental Oil	34-2 Conoco Mtn. Lion	5	nese 34/3S/21E (SLM) Wildcat Field Uintah Cty, UT	Mancos	10,250 PB: 10,210		WF, WOCT	
Spud: 6-30-78 Comp: 7-29-78	Pacific Transmission Supply	21-29 Amoco-Federal	4	nenw 29/9S/16E Castle Peak Field Duchesne Cty, UT	Wasatch	8,006		WO, D&A, DST-5,448-5,497	
Spud: 7-26-78 FR: 5-9-78	Gas Producing Enterprises	11-14-9-20 NBU CIGE	6	swse 14/9S/20E (SLM) Natural Buttes Field Uintah Cty, UT	Wasatch	6,500		D, WOCT	
Spud: 6-1-78 Comp: 7-8-78	Belco Petroleum	36-7B Natural Buttes Unit	6	nesw 7/9S/21E (SLM) Natural Buttes Field Uintah Cty, UT	Wasatch (5,926-6,970)	7,228 PB:	95,500 gal emul 200,000 lb sand	DG, no cores or tests	440
Spud: 4-26-78 Comp: 8-3-78	Belco Petroleum	30-18B Natural Buttes Unit	6	nese 18/9S/21E (SLM) Natural Buttes Field Uintah Cty, UT	Wasatch (5,680-7,192)	7,270 PB:	184,750 gal emul 426,000 lb sand	DG, no cores or tests	802
Spud: 1-10-78 Comp: 3-18-78	Belco Petroleum	1-32G Natural Buttes State	6	nese 32/9S/21E (SLM) Natural Buttes Field Uintah Cty, UT	Wasatch (7,318-7,756)	7,845 PB: 7,804	85,000 gal emul 165,000 lb sand	DG, no cores or tests	Not Available

Table 4-3 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 12-7-77 Comp: 7-6-78	Gas Producing Enterprises	27 Natural Buttes Unit	6	nesw 33/9S/21E (SLM) Natural Buttes Field Uintah Cty, UT	Wasatch (5,329-6,848)	8,991 PB: 6,920	141,000 gal gel 283,000 lb sand	DG, no cores or tests	775
Spud: 4-5-78 Comp: 5-22-78	Belco Petroleum	44-10 Chapita Wells Unit	6	sww 10/9S/22E (SLM) Natural Buttes Field Uintah Cty, UT	Wasatch (5,696-6,370)	6,500 PB:	134,750 gal emul 280,800 lb sand	DG, no cores or tests	2,030
Spud: 5-5-78 Comp: 8-8-78	Belco Petroleum	27-1B Natural Buttes Unit	6	sese 1/10S/20E (SLM) Natural Buttes Field Uintah Cty, UT	Wasatch (5,662-7,033)	7,842 PB: 7,061	93,400 gal emul 209,000 lb sand	DG, no cores or tests	480
Spud: 4-13-78 Comp: 7-25-78	Belco Petroleum	29-5B Natural Buttes Unit	6	sww 5/10S/21E (SLM) Natural Buttes Field Uintah Cty, UT	Wasatch (7,222-7,840)	7,902 PB: 7,870	173,750 gal gel 408,000 lb sand	DG, no cores or tests	4,070
Spud: 3-3-78 Comp: 5-29-78	Belco Petroleum	22-27B Natural Buttes Unit	6	swne 27/10S/21E (SLM) Natural Buttes Field Uintah Cty, UT	Wasatch (4,218-5,434)	5,505 PB: 5,460	100,000 gal emul 264,000 lb sand	DG, no cores or tests	1,450
Spud: 9-10-78 FR: 8-14-78	Colorado Interstate Gas Exploration	89-28-10-21 CIGE	6	nwse 28/10S/21E (SLM) Natural Buttes Field Uintah Cty, UT	Wasatch	5,800		D, WOCT	
Spud: 5-14-78 Comp: 7-25-78	Enserch Exploration	1-8 Sage Brush-Federal	7	swne 8/10S/23E (SLM) Natural Buttes Field Uintah Cty, UT	Mesaverde (6,390-7,496)	7,525	Acidized - 9,000 gal-262,164 gal gel, 409,000 lb sand	DG, no cores or tests	1,519
Spud: 4-21-78 Comp: 6-23-78	Enserch Exploration	1-18 Canyon View Federal	7	swnw 18/10S/23E (SLM) Natural Buttes Field Uintah Cty, UT	Mesaverde (6,104-6,874)	7,001	Acidized - 4,500 gal	DG, no cores or tests	1,399
Spud: 10-29-76 Comp: 6-15-77	Reserve O&G	13 Peter's Point Unit	8	nesw 12/13S/16E (SLM) Peter's Point Field Carbon Cty, UT	Green River (1,538-1,546)	3,750 PB: 1,693	Acidized - 4,000 gal-18,000 gal emul, 30,000 lb sand	DG	435
FR: 6-12-78 No Spud date rptd	Taiga Energy	2 Dry Burn Unit	9	nwne 35/13S/25E (SLM) Wildcat Field Uintah Cty, UT	Mancos	6,130		WF, WOCT, Operator has 4 additional Mancos tests in this locale	
Spud: 11-23-77 Comp: 4-14-78	Taiga Energy	1-1-23 Federal*	10	swne 23/14S/24E (SLM) Unnamed Field Uintah Cty, UT	Mancos B (5,416-5,804)	5,903 PB: 5,855	Acidized - 2,000 gal-61,970 gal emul, 216,000 lb sand	WFD, Mancos B Discovery - New Field	288
Spud: 5-28-78 Comp: 7-30-78	Exxon USA	1 Wolf Point Unit	11	sese 2/15S/21E (SLM) Wildcat Field Uintah Cty, UT	Wasatch	10,308		WF, D&A	

¹ From Petroleum Information

² Refer to Figure 2-3 and 2-4

* Listed in Table 2-1

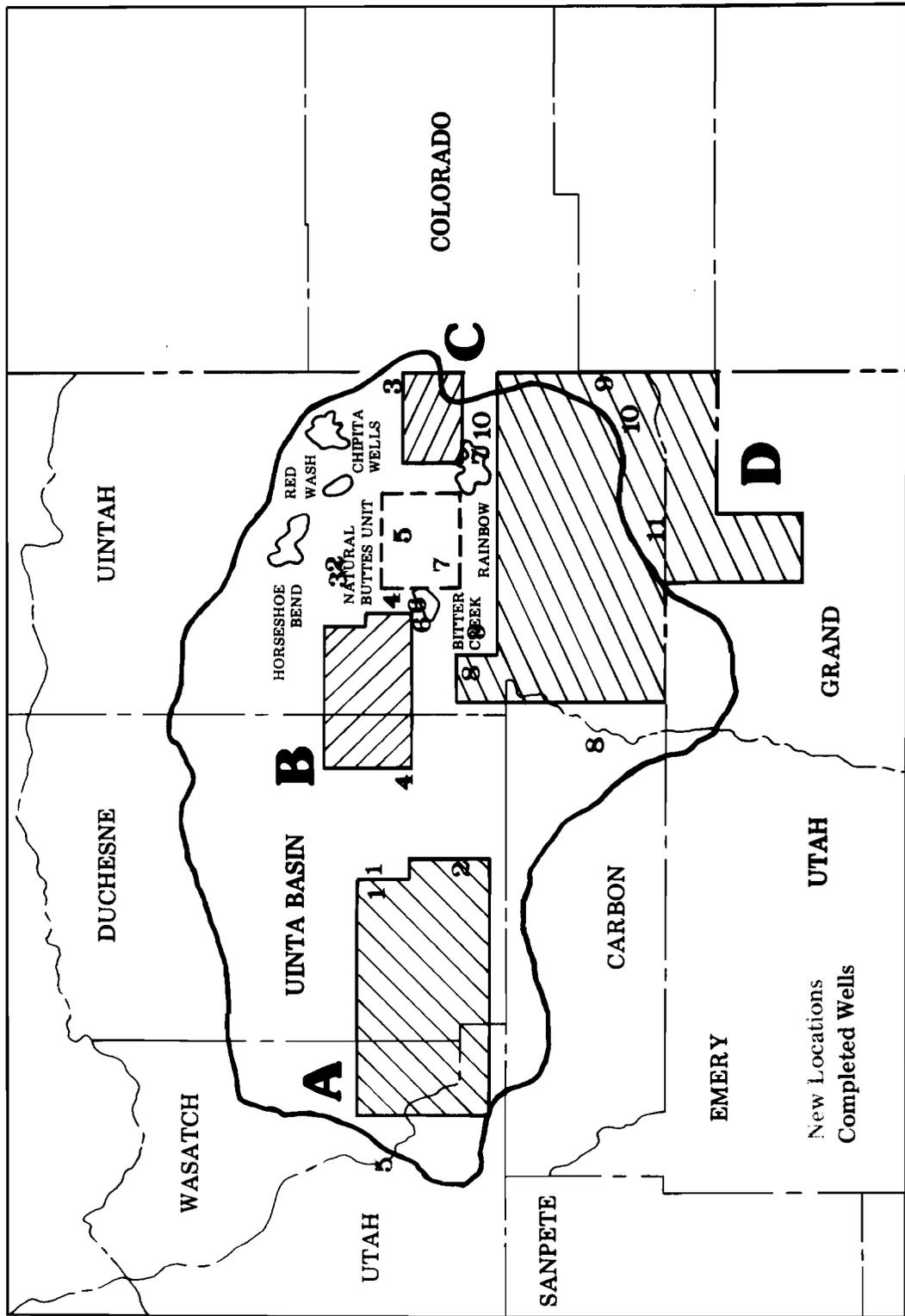


Figure 4-2 Wells Completed and Staked, USGS Designated Core Areas, Uinta Basin (Refer to Table 4-3 and 4-4)

Table 4-4 Summary of New Wells—Uinta Basin¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO ²	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 8-21-78 Spud: 9-4-78	W. A. Moncrief	10-1 Reiman	1	nsw 10/4S/6W (USM) Wildcat Field, Duchesne Cty, UT	?	WF, drilling 6,133 ft. Operator has 3 new unnamed tests in this locale
FR: 8-11-78	Gulf Oil	1-19 Ute Tribal	1	nsw 19/4S/6W (USM) Wildcat Field Duchesne Cty, UT	Wasatch (8,000)	WF, Operator has 13 Wasatch tests in this locale
FR: 9-8-78	Odessa Natural	18-1 Sowers Canyon Unit	2	senw 18/6S/5W (USM) Wildcat Field Duchesne Cty, UT	Mesaverde (15,400)	WF
FR: 7-17-78	Energy Reserves Group	1 State of Utah	3	nsw 29/7S/21E (SLM) Brennan Bottom Field Uintah Cty, UT	Wasatch (7,000)	D
FR: 6-13-78	Continental Oil	35-8 Conoco-Ute Tribal	4	nse 35/8S/20E (SLM) Natural Buttes Field Uinta Cty, UT	Mesaverde (11,743)	D, Operator has 3 Mesaverde tests in this locale
FR: 7-24-78	Amoco Production	1 Cottonwood Canyon USA	5	swnw 7/9S/6E (SLM) Wildcat Field Utah Cty, UT	Cretaceous (13,000)	WF
FR: 4-26-78	Mapco Inc.	7-25 B R BU	6	sene 25/9S/19E (SLM) Natural Buttes Field Uintah Cty, UT	Mesaverde (8,730)	D
FR: 7-31-78	Belco Petroleum	49-12B Natural Buttes	6	swse 12/9S/20E (SLM) Natural Buttes Field Uintah Cty, UT	Wasatch (8,700)	D, Operator has 18 new Wasatch tests in this locale
FR: 9-27-78	CIG Exploration	22-15-9-20 CIGE	6	senw 15/9S/20E (SLM) Natural Buttes Field Uintah Cty, UT	Wasatch (7,200)	D, Operator has 19 new Wasatch tests in this locale
FR: 5-9-78 Spud: 3-29-78	CIG Exploration	6-19-9-21 Natural Buttes Unit	7	nese 19/9S/91E (SLM) Bitter Creek Field Uintah Cty, UT	Not reported	D, @ 6,794 ft, running logs, Operator has 4 Wasatch tests in this locale
FR: 4-26-78	Mapco Inc.	5-11 D RBU*	8	swnw 11/10S/18E Uteland Butte Field Uintah Cty, UT	Mesaverde (8,455)	D, Operator has 8 Mesaverde tests in this locale
FR: 9-8-78	Wexpro	9 Island Unit	9	nsw 11/10S/19E Island Field Uintah Cty, UT	Wasatch (6,800)	D
FR: 8-14-78	Enserch Exploration	1-14 White River-Federal	10	nenw 14/10S/23E Natural Buttes Field Uintah Cty, UT	Wasatch (7,000)	D

Table 4-4 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO ²	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 3-27-78	Enserch Exploration	1-6 Sage HEN Federal	10	nese 6/10S/23E Natural Buttes Field Uintah Cty, UT	Mesaverde (7,000)	D, Operator has 6 Mesaverde tests in this locale
FR: 5-9-78 Spud: 7-8-78	Enserch Exploration	11-1 Jack Rabbit Federal	10	swne 11/10S/23E Southman Canyon Field Uintah Cty, UT	Mesaverde (7,500)	D, drilling, no depth reported
FR: 7-25-78	Enserch Exploration	1-15 Cliff Edge- Federal	10	nwse 15/10S/23E Natural Buttes Field Uintah Cty, UT	Mesaverde (7,000)	D

¹ From Petroleum Information

² Refer to Figure 4-2

*Listed in Table 4-1

5. Piceance Basin

5.1 CORE PROGRAM

The Piceance Basin of northwestern Colorado (Figure 5-1) has numerous tight Upper Cretaceous and Tertiary gas sands. Within the Mancos Formation the Castlegate (Rollins) and the Mancos "B" sands are the principal objectives. The Iles Formation of the Mesaverde Group contains the Corcoran, Cozzette, Sego and Trout Creek sand units which all have gas potential. Within the continental portion of the Mesaverde Group (Williams Fork Formation) and the continental Ft. Union and Wasatch Formations potential is present in both lenticular and blanket sand deposits. Most of these units are productive somewhere within the Piceance Basin. Actively producing gas fields include Cathedral, Piceance Creek, Trail Canyon, Thunder, Dragon Trail and Texas Mountain. However, in areas removed from productive fields, or in horizons below known producing zones, very little information is available. For example, in the Piceance Creek Field, very few wells have penetrated below the commercial Wasatch and therefore data is limited.

In an effort to better understand areas or horizons with minimal control, the USGS has recommended several key areas from which cores should be obtained. Within the Piceance Basin these areas are:

Area A

East of Rangely Field in Rio Blanco County, T1S to T2N, R98W to R99W.

Area B

Piceance Creek Field area, Rio Blanco County, T2S, R96W to R97W (below the Wasatch).

Area C

Garfield and Mesa Counties, T5S to T8S, R95W to R99W in the north tapering down to T98W to R99W on the southern part of the area.

Area D

Garfield and Mesa Counties, T8S to T10S, R92W to R94W (this area is flanked on the northwest and southeast by the Grand Mesa National Forest, see Figure 5-1).

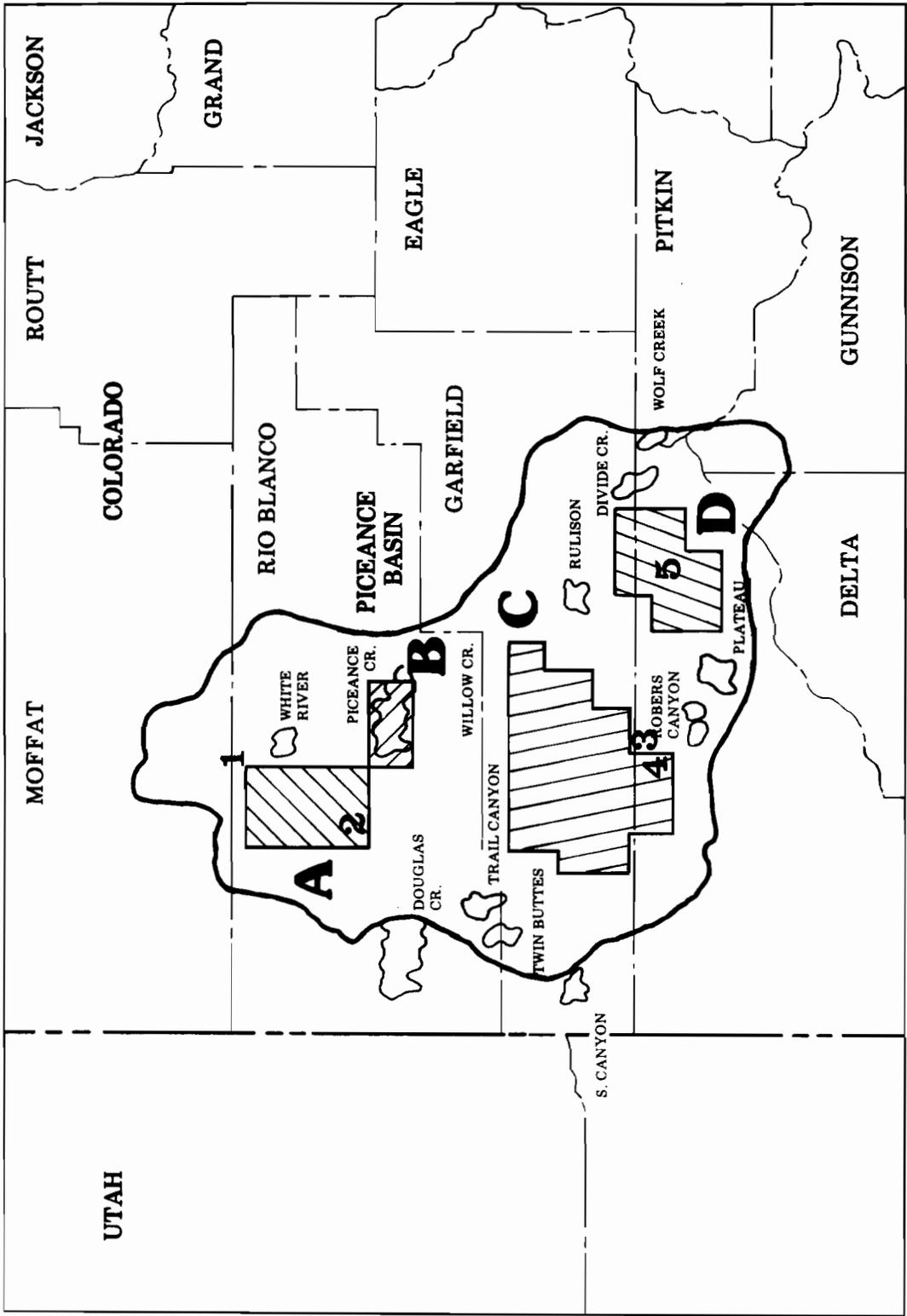


Figure 5-1 USGS Designated Core Areas and Wells of Interest, Piceance Basin (refer to Table 5-1)

Operators are contacted to discuss WGSP Core Program participation whenever a new well is staked in a designated core area and the well is scheduled to penetrate program objectives. During the third quarter of 1978, the following Piceance Basin operators were contacted:

Adolph Coors Company, Golden, Colorado
Exxon-Western Division, Denver, Colorado
General Crude, Denver, Colorado
Houston Oil & Minerals, Denver, Colorado
Teton Energy, Denver, Colorado
Twin Arrow, Rangely, Colorado

Teton Energy staked most of the third quarter new locations in the Piceance Basin of interest to the core program. These were all shallow Mesaverde development wells in the southern portion of the Basin (see Table 5-1). Nearby, Adolph Coors staked a location in Section 6, T8S, R97W to test the Dakota.

Several wells staked during previous quarters were completed by various operators including Mobil, David M. Munson, Indian Wells Oil, General Crude and Houston Oil and Minerals (Table 5-1 and 5-3).

In the Douglas Creek Arch area a well to be drilled by Twin Arrow, Inc., was under consideration for possible coring. The well, C&K 4-14, Section 14, T3S, R101W (Table 5-4), although located about 10 miles southwest of the nearest designated core area would still provide useful information, according to the USGS, on lithologic and diagenetic changes the Mesaverde sands undergo as the depth of burial is increased basinward.

5.2 DRILLING ACTIVITIES

Major objectives in the Piceance Basin are the Mancos ("B" sand) and Wasatch Formations in Rio Blanco County, the Cozzette and Corcoran Members of the Mesaverde Group in Mesa County, and the Dakota and Morrison Formations in the Douglas Creek Arch area of Garfield County. Dakota and Morrison wells are not tabulated or closely monitored for the Western Gas Sands Project.

Within the Piceance Basin, 26 wells were completed in Upper Cretaceous and Tertiary horizons during the third quarter of 1978. Twenty of the wells completed were classed as development, an increase of 6 over the previous quarter. Six wildcat wells were also drilled during the quarter, which is twice the number drilled in the second quarter. The success ratio for the third quarter rose slightly, from 76 percent (13 of 17 wells) to 81 percent (21 of 26 wells). Wildcats were particularly successful, with 4 of 6 wells being new discoveries. New production for the quarter totaled 10,075 MCFD, more than double the total of the second quarter. The Mancos "B" accounted for about 37 percent of the new gas production, but for the first time in a year the Wasatch Formation also added a significant amount to the total; about 21 percent of the new production. Some of the Wasatch wells were drilled during the previous quarter but they were not placed onstream until this quarter. The quarterly tabulation of production is summarized in Table 5-2.

**Table 5-1 Summary of Wells Located in USGS Designated Core Areas—Piceance Basin¹
(Data as of September 30, 1978)**

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IFF in MCFD
Spud: 6-18-78 FR: 3-14-78	General Crude Oil	15-29 Colorow Gulf Federal	1	sww 29/3N/97W Wildcat Field Rio Blanco Cty, CO	Weber (12,400)			WF, @ 11,840 RDRT	
Spud: 6-29-78 Comp: 9-2-78	Houston Oil & Minerals	24X-21 Federal	1	sew 21/3N/98W Wildcat Field Rio Blanco Cty, CO	Weber	9,610		WF, no cores, D&A	
Spud: 2-5-78 Comp: 6-5-78	David M. Munson	30-1-99 Cities Service [†]	2	nsw 30/1S/99W Wildcat Field Rio Blanco Cty, CO	Mancos (9,007-9,311)	9,610		WFD, Mancos B Discovery	2,091
FR: 6-12-78	David M. Munson	5-2-99 Federal*	2	swnw 5/2S/99W Wildcat Field Rio Blanco Cty, CO	Mancos (9,300)			WF	
FR: 7-25-78	Teton Energy	1 Getty et al*	3	nsw 21/8S/97W Debeque Field Mesa Cty, CO	Mesaverde (1,600)			D, Operator has 3 additional Mesa-verde tests in this locale	
FR: 7-28-78	Adolph Coors Company	1-6 Federal	3	sene 6/8S/97W Wildcat Field Garfield Cty, CO	Dakota (8,600)			WF	
FR: 1-23-78	Teton Energy	1-34 Federal	4	sene 34/8S/98W Coon Hollow Field Mesa Cty, CO	Morrison (7,500)			D, tight hole	
FR: 4-5-78	Exxon	2 Vega Unit	5	nsw 34/9S/93W Unnamed Field Mesa Cty, CO	Corcoran (8,630)			WO, drilling, no depth reported	

¹ From Petroleum Information

² Refer to Figure 2-3 and 2-4

*Listed in Table 2-1

Table 5-2 Summary of Drilling Activities, Piceance Basin *

	NO. OF WELLS				Producing Horizons in MCFD														Total
	Wildcats		Development		Green River				Mesaverde				Mancos						
	D&A	Disc	D&A	Prod.	Undifferentiated	Douglas Creek	Wasatch	Ft. Union	Undifferentiated	Cozette	Corcoran	Sego	Undifferentiated	Carlsberg/Rollins	Mancos B	Morapos	Commingled		
3rd Quarter 1977	2	0	5	9	16	0	0	2	0	0	0	0	0	2,585	0	157	0	183 ²	2,927
4th Quarter 1977	1	3	8	41	53	0	2,000	3,816 ¹	0	1,000	0	0	0	4,627	0	4,753 ²	0	6,657 ²	22,853
1st Quarter 1978	2	1	0	27	30	0	0	0	9	3,132	0	140	0	3,311	0	2,239 ¹	0	0	8,831
2nd Quarter 1978	2	1	2	12	17	0	0	0	0	0	0	0	0	0	0	4,491	0	0	4,491
3rd Quarter 1978	2	4	3	17	26	0	0	2,151	0	0	0	0	0	1,949 ¹	335	3,866	0	1,774 ⁴	10,075

1. IPF not available for one producing well
2. IPF not available for two producing wells
3. Commingled production - Rollins/Cozette/Corcoran - 4,422 MCFD
Cozette/Corcoran - 2,235 MCFD
4. Commingled production - Cameo/Cozette/Corcoran - 460 MCFD
Morapos/Mancos - 481 MCFD
Rollins/Cozette/Corcoran - 833 MCFD
5. Commingled production - Rollins/Cozette/Corcoran - 183 MCFD

*Data compiled from P.I. Rocky Mountain Region Report "Completions," October 6, 1977—October 4, 1978.

Most new activity during the quarter was in Rio Blanco County in the Douglas Creek Arch area. Wexpro and Donald C. Slawson were particularly active staking new locations for Mancos "B" tests in the Cathedral Field area. Other operators active in this area included Chandler and Associates, Northwest Exploration, Twin Arrow, Fuel Resources Development, American Resources Management, and Taiga Energy (Coseka).

To the south, there is also much activity planned in the Plateau-Debeque area of Mesa County. Teton Energy and Adolph Coors have scheduled a number of development wells to the Mesaverde-Corcoran and Cozette sands. With one exception the Coors sites were staked during the second quarter while the Teton wells were staked at the end of the third quarter.

In the Piceance Creek Field area, Rio Blanco County, a new Wasatch test was staked by William Moss Properties. Indian Wells Oil Company completed two Wasatch wells in the area, one a D&A wildcat, the second a producing extension well.

Several Wasatch tests staked last quarter by Indian Wells Oil Company have not yet been spudded. Refer to Table 5-3 and 5-4 for summaries of wells completed and newly staked, and to Figure 5-2 for their respective locations.

Since the areas of interest to the WGSP in the Piceance Basin are "tight" and generally have low deliverability, operators are making considerable investments in well completion and stimulation technology. A variety of techniques have been utilized with no consensus to date as to the one which is most successful. It does seem, though, that a complete cleanup is essential after treatment. Many operators in the basin are utilizing carbon dioxide or nitrogen to speed clean up time.

Table 5-3 Summary of Wells Completed—Piceance Basin¹
(Data as of September 30, 1978)

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 6-29-78 Comp: 9-2-78	Houston Oil & Minerals	24X-21 Federal	1	sesw 21/3N/98W Wildcat Field Rio Blanco Cty, CO	?	9,610		WF, D&A, no cores, within core area A	
Spud: 4-24-78 Comp: 6-22-78	Indian Wells Oil	33-1-97 Indian Wells Federal	2	nese 33/1S/97W Piceance Creek Field Rio Blanco Cty, CO	Wasatch (2,544-5,823)	6,168 PB: 5,789	Acidized - 3,500 gal-20,000 gal water, 30,000 lb	WOE, Wasatch Extension - Piceance Creek	250
Spud: 2-5-78 Comp: 6-5-78	David M. Munson	30-1-99 Cities Service*	3	nesw 30/1S/99W Unnamed Field Rio Blanco Cty, CO	Mancos B (9,007-9,311)	9,610		WFD, Mancos B Discovery	2,091
Spud: 8-2-78 Comp: 8-6-78	Chandler & Associates	10-11-1-2 Fork Unit	4	nwse 11/1S/102W Dragon Trail Field Rio Blanco Cty, CO	Mancos	623		D, J&A, no cores or tests, projected to 2,600 ft	
Spud: 6-26-78 Comp: 7-28-78	Chandler & Associates	6-11-1-2 Fork Unit	4	senw 11/1S/102W Dragon Trail Field Rio Blanco Cty, CO	Mancos (2,428-2,498)	2,692	92,000 gal water, 215,000 lb sand	DG, no cores or tests	472
Spud: 7-1-78 Comp: 8-7-78	Chandler & Associates	14-11-1-2 Fork Unit	4	sesw 11/1S/102W Dragon Trail Field Rio Blanco Cty, CO	Mancos (2,302-2,387)	2,540	81,000 gal water, 215,000 lb sand	DG, no cores or tests	510
Spud: 4-23-78 Comp: 7-10-78	Mobil Oil	T81-18G USA	5	nene 18/2S/96W Piceance Creek Field Rio Blanco Cty, CO	Wasatch (2,660-3,465)	3,600 PB:	Acidized - 3,500 gal-28,000 gal emul, 120,000 lb sand	DG, no cores or tests	1,901
Spud: 5-23-78 FR: 1-13-78	Mobil Oil	T73-30G USA	6	swne 30/2S/95W Piceance Creek Field Rio Blanco Cty, CO	Wasatch	6,915	Acidized - 2,000 gal-38,000 gal gel, 78,000 lb sand	D, testing, Operator has 6 Wasatch tests in this locale	
Spud: 5-13-78 FR: 1-13-78	Mobil Oil	T87-3G USA	5	sese 3/2S/97W Piceance Creek Field Rio Blanco Cty, CO	Wasatch	3,300		D, SI	
Spud: 5-3-78 FR: 1-13-78	Mobil Oil	T73-11G-USA	5	sene 11/2S/97W Piceance Creek Field Rio Blanco Cty, CO	Wasatch	3,400		D, SI	
Spud: 9-10-76 Comp: 2-26-77	Northwest Exploration	2 Philadelphia Creek	7	swse 4/2S/101W Unnamed Field Rio Blanco Cty, CO	Mancos B (2,305-2,528)	2,947 PB: 2,937	Acidized - 1,000 gal-50,000 gal water, 50,000 lb sand	DG, no cores or tests	196
Spud: 6-17-78 Comp: 8-12-78	Donald C. Slawson	9-1 Federal	7	senw 9/2S/101W Cathedral Field Rio Blanco Cty, CO	Mancos (2,235-2,574)	2,850	Acidized - 3,500 gal-1,470 gal water, 158,850 lb sand	DG, no cores or tests	464
Spud: 11-26-77 Comp: 7-4-78	Fuel Resources Development	20-2 Chancellor Federal	7	nene 20/2S/101W Cathedral Field Rio Blanco Cty, CO	Emery (2,186-2,458)	2,605 PB: 2,537	Sdwtr frac	DG	314

Table 5-3 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 11-20-77 Comp: 7-1-78	Fuel Resources Development	20-3 Chancellor Federal	7	nwse 20/2S/101W Cathedral Field Rio Blanco Cty, CO	Emery (2,401-2,599)	2,737 PB: 2,674	25,000 gal water, 100,000 lb sand	DG, no cores or tests	332
Spud: 8-30-78 Comp: 9-14-78	Chancellor and Ridgeway	33-2 Federal	7	swse 33/2S/101W Cathedral Field Rio Blanco Cty, CO	Mancos B (1,757-1,945)	2,156 PB: 2,091	Acidized - 2,100 gal-80,000 gal water, 200,000 lb sand	DG, no cores or tests	442
Spud: 1-31-78 Comp: 5-11-78	Twin Arrow	5-34 Mountain Fuel	7	nese 34/2S/101W Cathedral Field Rio Blanco Cty, CO	Mancos B (1,959-2,220)	2,491	Acidized - 1,000 gal-212,000 lb sand, 100 tons CO ₂	DG, no cores or tests	261
Spud: 12-30-77 Comp: 6-9-78	Continental Oil	13 West Douglas Creek	8	nwne 25/2S/103W West Douglas Creek Field Rio Blanco Cty, CO	Mancos B (2,392-2,736)	2,809	Acidized, fract	DG, no cores or tests	403
Spud: 10-28-77 Comp: 4-11-77	Twin Arrow	3-17 Continental	9	sesw 17/3S/100W Cathedral Field Rio Blanco Cty, CO	Mancos (1,992-3,190)	3,586	Acidized - 3,000 gal, 15,000 gal foam, 151,000 lb sand	DG, no cores or tests	85
Spud: 11-16-77 Comp: 2-9-78	Twin Arrow	1-17 Continental	9	nene 17/3S/100W Cathedral Field Rio Blanco Cty, CO	Morapos (3,864-3,872) Mancos (3,906-4,090)	4,500	Acid frac, 1,800 gal	DG, commingled	481
Spud: 11-10-77 Comp: 7-4-78	Fuel Resources Development	3-2 Federal	9	sese 3/3S/101W Cathedral Field Rio Blanco Cty, CO	Emery (2,224-2,437)	2,671 PB: 2,608	1,500 BW 130,000 lb sand	DG, no cores or tests	88
Spud: 3-17-78 Comp: 4-18-78	Lawrence J. Barker	18 Superior Fee	10	sesw 1/4S/102W South Douglas Creek Rio Blanco Cty, CO	Castlegate (1,252-1,309)	1,309	Natural	DG	335
Spud: 3-23-78 Comp: 5-27-78	Taiga Energy	4RX Taiga-Federal	10	swse 16/4S/102W Thunder Field Rio Blanco Cty, CO	Mancos (3,080-3,134)	4,037 PB: 3,680	18,500 gal gel, 55,000 lb sand	DG, no cores or tests	139
FR: 5-15-78	Union Oil of California	1 Gunderson*	11	nwne 20/9S/93W Buzzard Creek Field Mesa Cty, CO	?	8,200		D, testing, old info: Comp 11-8-57, IPF = 385 MCFD, Prod zone - Mesaverde. WOE, commingled, no cores	
Spud: 8-9-77 Comp: 2-26-78	Teton Energy	1-15 Kathlyn Yang	12	n4sw 15/10S/95W Plateau Field Mesa Cty, CO	Cameo (4,248-4,260) Cozzette (4,832-4,880) Corcoran (4,970-4,997)	9,410 PB: 5,210	38,000 gal water, 41,258 lb sand, 60,500 gal water, 115,000 lb sand		460
Spud: 12-20-77 Comp: 2-18-78	Norris Oil	21-3 Nichols	12	nwne 21/10S/96W Plateau Field Mesa Cty, CO	Rollins (2,731-2,817) Cozzette (3,045-3,056) Corcoran (3,178-3,246)	3,419 PB: 3,357	47,562 gal water, 374,000 lb sand	DG, no cores or tests, commingled	833

Table 5-3 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO. ²	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
Spud: 7-15-78 Comp: 7-24-78	Amoco Production	1 Hotchkiss Ranchers	13	nwse 20/12S/89W Wildcat Field Gunnison Cty, CO	Mancos Rollins Member	2,635 PB: 2,300		WF, D&A	

¹ From Petroleum Information

² Refer to Figure 5-2

*Listed in Table 5-1

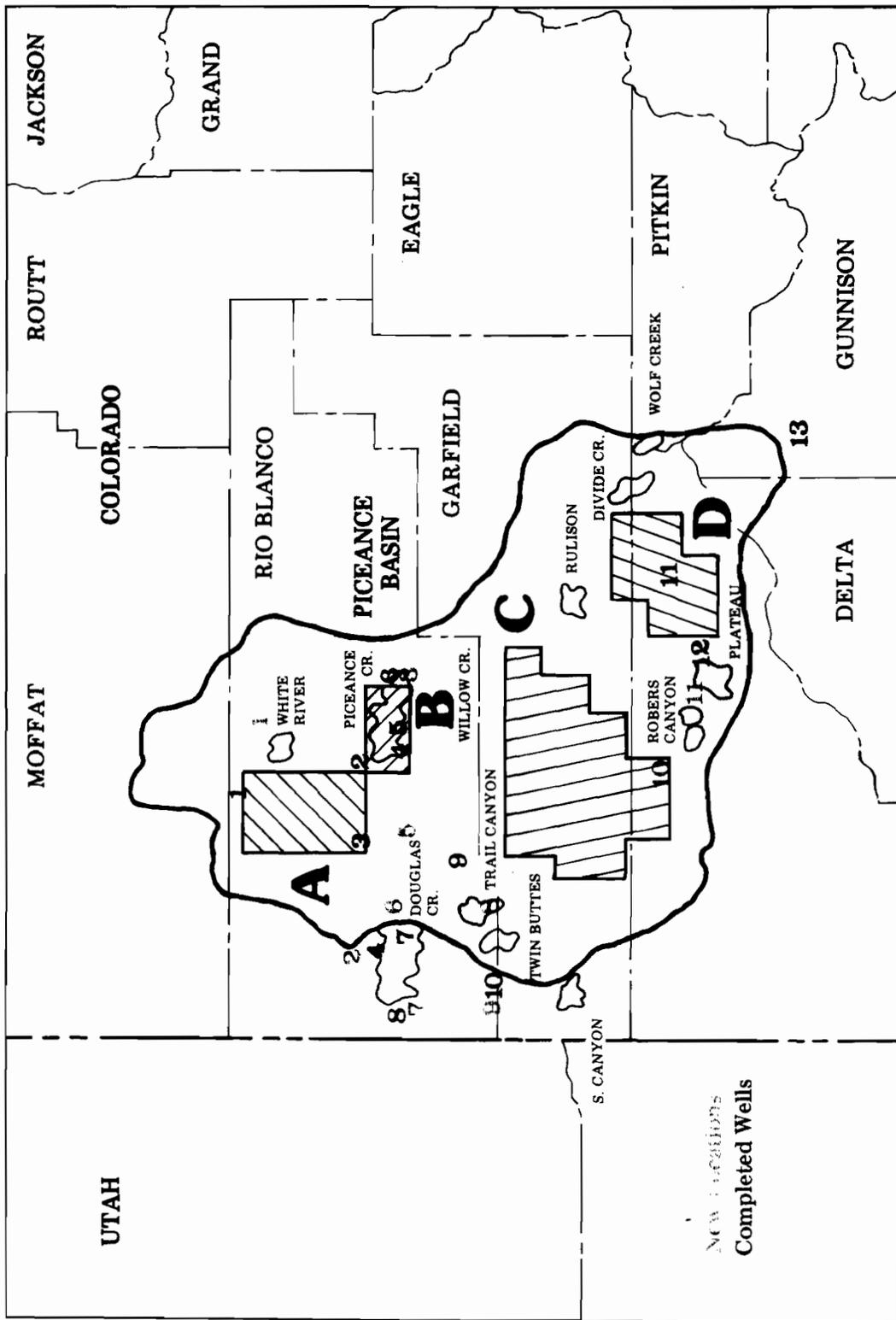


Figure 5-2 Wells Completed and Staked, USGS Designated Core Areas, Piceance Basin (Refer to Tables 5-3 and 5-4)

Table 5-4 Summary of New Wells—Piceance Basin¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO ²	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 7-28-78	Fuel Resources Development	6M Federal	1	sew 20/2N/96W White River Field Rio Blanco Cty, CO	? (7,700)	D
FR: 8-11-78	Chandler & Associates	10-11-1-2X Fork Unit	2	nws 11/1S/102W Douglas Creek North Field Rio Blanco Cty, CO	? (2,600)	D, Operator has 2 Mancos tests in this locale
FR: 8-29-78	Northwest Exploration	3 Cottonwood Creek-Federal	2	nese 34/1S/103W Lower Horse Draw Field Rio Blanco Cty, CO	Mancos (2,100)	D, Operator has 4 new Mancos tests in this locale
FR: 4-24-78	Indian Wells Oil Company	9-2-95 Indian Wells Federal	3	senw 9/2S/95W Piceance Creek Field Rio Blanco Cty, CO	Wasatch (6,600)	WO, Operator has 5 Wasatch tests in this locale
FR: 7-25-78	William Moss Properties	16-9-2-97 Federal	4	nene 9/2S/97W Piceance Creek Field Rio Blanco Cty, CO	Wasatch (6,200)	D, Operator has 2 Wasatch tests in this locale
FR: 6-12-78	David M. Munson	5-2-09 Federal*	5	swnw 5/2S/99W Wildcat Field Rio Blanco Cty, CO	Mancos (9,300)	WF
FR: 8-18-78	Donald C. Slawson	9-2 Federal	6	nese 9/2S/101W Cathedral Field Rio Blanco Cty, CO	Mancos (2,850)	D, Operator has 3 new Mancos tests in this locale
FR: 7-14-78	Wexpro	23-2 Federal	6	nws 23/2S/101W Cathedral Field Rio Blanco Cty, CO	Mancos (2,560)	D, Operator has 5 new Mancos tests in this locale
FR: 7-5-78	Wexpro	10-1 MF-Federal-C	7	nws 10/2S/103W Lower Horse Draw Field Rio Blanco Cty, CO	Mancos (3,225)	D, Operator has 3 new Mancos tests in this locale
FR: 9-30-78	Twin Arrow	4-14 C&K	6	nese 14/3S/101W Cathedral Field Rio Blanco Cty, CO	Mancos (4,000)	WF, Operator has 3 Mancos tests in this locale
FR: 8-25-78 Spud: 8-31-78	Fuel Resources Development	0-27-3-101-S Federal	6	swse 27/3S/101W Cathedral Field Rio Blanco Cty, CO	? (4,740)	D, @ 4,711, WOCT, Operator has 2 unnamed tests in this locale
FR: 8-11-78	Northwest Exploration	4 Texas Creek	7	swsw 10/3S/103W Wildcat Field Rio Blanco Cty, CO	? (6,025)	WF
FR: 9-20-78	Adolph Coors	1-19 USAC 7867	7	nene 19/3S/103W Wildcat Field Rio Blanco Cty, CO	Mancos (4,000)	WF
FR: 4-28-78	Tipperary Oil & Gas Company	6-30-D Soldier Canyon Unit	8	nws 30/4S/100W Trail Canyon Field Rio Blanco Cty, CO	? (9,400)	DG, Operator has 3 unnamed new tests in this locale
FR: 8-16-78	American Resources Management	14-3 Federal	8	sene 14/4S/101W Trail Canyon Field Rio Blanco Cty, CO	? (6,900)	D, Operator has 2 6,900 ft tests in this locale

Table 5-4 Continued¹

DATE	OPERATOR	WELL NAME	MAP INDEX NO ²	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 4-24-78	Taiga Energy	10-N-21 Taiga Fee	9	nesw 21/4S/102W Thunder Field Rio Blanco Cty, CO	Mancos (3,836)	D, Operator has 10 Mancos tests in this locale
FR: 8-3-78	Provident Resources	10-31 Federal C-561	9	swne 31/4S/102W Evacuation Creek Field Rio Blanco Cty, CO	Mancos B (5,500)	D
FR: 7-25-78	Teton Energy	1 Getty et al*	10	nsw 21/8S/97W Debeque Field Mesa Cty, CO	Mesaverde (1,600)	D, Operator has 4 new Mesaverde tests in this locale
FR: 9-27-78	Chandler & Associates	13-31 Grumhaus-Federal	11	sww 31/9S/96W Shire Gulch Field Mesa Cty, CO	Corcoran (3,500)	D, close to core areas A and B
FR: 7-6-78	Norris Oil	13-3 Friends	11	swne 13/10S/96W Plateau Field Mesa Cty, CO	Corcoran (4,150)	D
FR:	Adolph Coors	1-19 Fetters	11	senw 19/10S/96W	? (3,200)	D, Operator has 4 Mesaverde tests in this locale

¹ From Petroleum Information
² Refer to Figure 5-2
 *Listed in Table 5-1