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Western Gas Sands Project

Quarterly Basin Activities Report

July 1 - September 30, 1979

Prepared for
U.S. Department of Energy

Bartlesville Energy Technology Center
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Las Vegas, Nevada

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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
Cp	Drilling completed
DIL	Dual Induction Laterlog
D&A	Dry and Abandoned
FDC	Formation Density Log
Fr	First Report
GR	Gamma Ray
PB	Plugged back
SDR	Shut down for repairs
SDW	Shut down for weather
SI	Shut in
Spud	Commencement of drilling
Sp	Spud In
SP	Spontaneous Potential
SN	Sidewall Neutron
Swb(d)(g)	Swabbed, swabbing
TD	Total Depth
Tstg	Testing
WOCT	Waiting on completion tools
WOO	Waiting on orders

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, 1979. 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 the USGS for obtaining core. Operators active in these specific areas are located by monitoring new activity in each area and contacted by CER Corporation 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 section identifies industry activity within the preferred core areas 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 red and blue 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 21, 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*. These reports may be obtained from the Technical Information Center (TIC), Post Office Box 62, Oak Ridge, Tennessee, 37830, except the Core Program document, which is available from CER Corporation, 4220 South 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. These areas include:

- Powder River County — T5S, R52E to T53E.
- Custer and Prairie Counties — T10N to T11N, R48E to R49E.
- Valley County — T29N to T30N, R35E to R37E.
- Phillips County — T29N to T30N, R26E to R27E.

The four areas (see Figure 2-1 for location) were chosen for the following reasons:

- They are removed from productive fields and little data is available in the areas.
- There are two or more potential reservoir intervals and adjacent source beds in the areas.
- The combination of these areas 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 2-2 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.

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

In the Northern Great Plains Province, Chevron declined a coring contract for a well in southeast Montana, but will send any core that is taken to the USGS when their own studies have been completed. Midlands (Kansas-Nebraska) agreed to coring their Phillips County, Montana, well and a stratigraphic study of the area is in progress. B. Pickard, representing Sugar Creek Resources, contacted CER Corporation with a proposed Montana drilling site in response to the WGSP core program publicity in the *Oil and Gas Journal*.

Table 2-1 is a summary of wells located in USGS designated core areas and Figure 2-1 shows the location of these wells.

Table 2-1 Summary of Wells Located in USGS Designated Core Areas — Northern Great Plains Province

DATE	OPERATOR	WELL NAME	MAP INDEX NO.	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
FR: 10-5-78 SP: 11-16-78	J. J. C. Paine & Associates	1-0407 Strommen	1	nesw 4/30N/37E Unnamed Field Valley Cty, MT	Greenhorn (1,375)	1,425		WO...WOCT, located in core area C.	
FR: 10-5-78 SP: 11-13-78	J. J. C. Paine & Associates	1-0507 Strommen	1	sese 5/30N/37E Unnamed Field Valley Cty, MT	Greenhorn (1,375)	1,425		WO...WOCT, located in core area C.	

2.2 DRILLING ACTIVITIES

Production in the third quarter decreased 26 percent from the previous quarter. Although production from the Eagle and Blackleaf Formations increased substantially from last quarter, production from the Shannon and Phillips Formations decreased. The Eagle Formation contributed 56 percent of total production, Bow Island/Muddy contributed 34 percent of production, Blackleaf produced 7 percent, Carlile Formation produced 2 percent and Phillips contributed 1 percent towards total production.

Although the total production was down, the total of 75 completed wells only decreased by one from last quarter. Fifty-five were development wells, with 33 producing and 22 D&A. Only 4 wildcat wells were producing by quarter's end, compared to the 16 wildcats declared D&A. A summary of drilling activities for the Northern Great Plains Province is given in Table 2-2.

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

	NO. OF WELLS				Total	Producing Horizons in MCFD												
	Wildcats		Development			Judith River	Undifferentiated	Eagle		Undifferentiated	Carlile		Green horn	Frontier	Blackfoot	Bow Island - Muddy	Commenced	Total
	D&A	Disc.	D&A	Prod.				Vigilante	Shannon		Niobrara	Bowdoin						
2nd Quarter 1977	24	7	10	34	75	0	5,345 ^{1,2}	0	700	0	0	460	2,699	4,123	5	5,529	2,768 ^{1,3}	21,629 ^{1,4}
3rd Quarter 1977	13	6	13	40	72	0	1,249 ⁵	0	0	0	0	4,924	354	622	630 ⁹	6,280 ¹⁰	23,719 ¹¹	37,778
4th Quarter 1977	13	6	17	50	86	340	7,068 ¹	0	1,348	0	0	1,126	1,911	227	1,417	5,373	12,359 ²	31,169
1st Quarter 1978	13	3	13	26	55	40	6,985	0	0	0	not available	0	50	0	259	2,489	17,943 ³	27,766
2nd Quarter 1978	9	1	4	10	24	0	5,174 ¹	0	0	0	0	0	0	0	645	0	253 ⁴	6,072
3rd Quarter 1978	17	7	38	25	87	0	18,975 ⁵	0	0	0	0	1,406	410 ⁷	0	0	1,406	1,798 ⁶	23,995
4th Quarter 1978	31	5	36	55	127	189	7,406 ^{1,4}	0	0	0	0	5,197	4,301 ¹	610	157	7,560 ^{1,8}	2,386 ^{1,5}	28,183
1st Quarter 1979	12	9	13	67	101	0	4,724 ^{1,7}	0	0	0	0	3,741	0 ^{1,8}	0	0	787	3,834 ^{1,9}	13,086
2nd Quarter 1979	13	6	8	49	76	0	3,528 ¹	0	2,037 ^{2,2}	296	0	3,678	4,290	0	267	5,621 ^{1,0}	1,446 ^{2,1}	21,163
3rd Quarter 1979	16	4	22	33	75	0	8,674 ^{1,7}	0	0	0	260	0	217	0	1,064	5,363 ¹	not ^{2,3} available	15,578

1. IPF not available from one well.
2. Bowdoin/Greenhorn
3. Judith River/Eagle - 60
Bowdoin/Phillips - 15,894
Bowdoin/Greenhorn/Phillips - 844
Greenhorn/Phillips - 1,145
4. Fish Scales/Bow Island
5. Natural production: 13,931
6. Bowdoin/Phillips - 284
Bowdoin/Greenhorn - 368
Blackleaf/Spike (natural) - 699
Bowdoin/Greenhorn/Phillips - 447
7. 158 natural "White Specks"
8. Natural production

9. Natural production
10. 4,245 - natural
11. Bowdoin/Greenhorn/Phillips - 14,878
Bowdoin/Greenhorn - 1,180
Bowdoin/Phillips - 3,446
Prairie/Greenhorn/Phillips - 3,690
Colorado/Blackleaf/Bow Island - 89
Colorado/2nd Bow Island - 436
12. Natural production - 4,560
13. Bowdoin/Phillips - 205
Blackleaf/Bow Island - 2,500
Judith River/Eagle - 63
14. Natural Production - 2,490
15. Bowdoin/Phillips - 1,710
Bowdoin/Greenhorn/Phillips - 676
Blackleaf/Bow Island - not available

16. IPF not available from two wells
17. IPF not available from six wells
18. IPF not available from eleven wells
19. Bowdoin/Phillips - 960
Bowdoin/Greenhorn - 711
Greenhorn/Phillips - 2,078
Eagle/Bowdoin - 85
20. Natural Production - 449
21. Bowdoin/Greenhorn/Phillips - 1,361
Bowdoin/Eagle - 85
22. IPF not available from five wells
23. Blackhead/Bow Island

* Data compiled from P. I. Rocky Mountains Region Report "Completions"

Colorado Interstate Gas Exploration and Chevron Oil are continuing their exploration programs for Niobrara and Morrison objectives, respectively. Both are currently active in Custer and Rosebud Counties with CIGE also active in Garfield, Fallon and Carter Counties. Activity on the Bearpaw Arch and Bowdoin Dome area continues at a rate similar to previous quarters of 1979. Sugar Creek Resources has 3 Eagle tests (2,000 ft) located on the west flank of Cedar Creek Anticline, Fallon County. These tests represent a new attempt to expand the Eagle, and possibly Judith River, production off the anticline. The original discovery well was completed in 1912.

Joseph J. C. Paine has about 30 wells staked or in various stages of completion in the area of Little Missouri Field of Bowman County, North Dakota. The Eagle formation is the objective zone. In South Dakota, Jerry McCutchin, Jr., is continuing Shannon (lower Eagle) exploration in the West Short Pine Hills Field of Harding County, with 1 test currently planned to the deeper Greenhorn formation. This test is located in Cady Creek Field, southeast of West Short Pine Hills Field.

The largest fracture treatment reported this quarter was performed on Joseph J. C. Paine & Associates' No. 1 Chapman, Little Missouri Field, Bowman County, North Dakota. The well produced 368 MCFD of new gas after being fractured with 24,612 gal fluid and 75,000 lb sand.

Summaries of completed wells and active and newly located wells are listed in Tables 2-3 and 2-4, respectively. Figure 2-3 shows the locations of these wells:

Table 2-3 Summary of Wells Completed—Northern Great Plains Province

DATE	OPERATOR	WELL NAME	MAP INDEX NO.	LOCATION Sec/T/R or Producing Interval	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IFF in MCFD
SP: 7-15-78 CP: 7-18-78	Cabot Corp.	1-22 Prince and Sons	1	nesw 22/5N/27E Wildcat Field Stanley Cnty, SD	Niobrara (2,000)	(1,200)		WF, D&A. Operator completed 2 other 2,000 ft wells in this locale, all D&A.	
SP: 11-17-78 CP: 11-21-78	Charles G. Knight	1 IRA	2	sesw 26/7S/52E Wildcat Field Powder River Cnty, MT	Muddy (5,000)	5,050		WF, D&A.	
SP: 6-20-79 CP: 6-22-79	Devon Corp.	1 Mees	3	nwse 1/22N/19E Wildcat Field Fergus Cnty, MT	Eagle (2,000)	1,718		WF, D&A. no cores or tests.	
SP: 6-17-79 CP: 6-19-79	Devon Corp.	2 Gladly Mees	3	nwne 2/22N/19E Wildcat Field Fergus Cnty, MT	Eagle (2,000)	1,940		WO, no cores or tests.	
SP: 6-11-79 CP: 6-13-79	Devon Corp.	1 C Olson et al	4	swse 26/23N/19E Leroy Field Fergus Cnty, MT	Eagle (2,000)	1,554		WO, D&A.	
SP: 6-26-79 CP: 6-28-79	Devon Corp.	1 Osburnsen	5	swsw 31/23N/20E Wildcat Field Fergus Cnty, MT	Eagle (2,000)	1,950		WF, D&A. no cores or tests.	
SP: 7-7-79 CP: 7-8-79	Balcron Oil	2-5 Tweet	6	sese 5/29N/1W Ledger Field Pondera Cnty, MT	Bow Island (593-603) open hole	603		DG, no logs run, no cores or tests, operator has 16 additional Bow Island completions in the area.	130
SP: 6-16-79 CP: 7-17-79	Tricentrol U.S.	16-16 State	7	sese 16/30N/15E Tiger Ridge Hill Cnty, MT	Eagle (1,442-1,460)	1,800	30,000 lb sand	DG, no cores or tests, operator has 5 other Eagle completions in the area.	1,200
SP: 6-18-79 CP: 6-23-79	J. Burns Brown	19-32-19B Mueller	8	swnw 19/32N/19E Black Coulee Blaine Cnty, MT	Eagle (1,500)	1,390		DG, D&A. no cores or tests, operator has 6 other Eagle completions in the area.	
SP: 6-7-79 CP: 8-22-79	Falcon-Colorado Exploration	2-5 Bowman	9	senw 5/32N/35E Swanson Creek Field Phillips Cnty, MT	Phillips (1,225-1,236)	1,430	250 gal acid, 13,000 gal water, 40,000 lb sand	DG, no cores or tests.	233
FR: 6-9-78	J. Burns Brown	3-32-15 State	10	swne 3/32N/15E Unnamed Field Hill Cnty, MT	Eagle (1,600)			D, Abandoned location.	
SP: 6-12-79 CP: 6-17-79	Grace Petroleum	6-9 Van Dressel	11	senw 9/34N/7E Unnamed Field Liberty Cnty, MT	Bow Island (2,140)	2,149		D, D&A.	
SP: 12-19-78 CP: 6-21-79	Odessa Natural Corp.	1 Ivanovitch	12	nesw 14/36N/32E Wildcat Field Phillips Cnty, MT	Phillips (1,600)	1,981		WF, D&A.	
SP: 6-30-79 CP: 7-31-79	J. J. C. Paine and Associates	1 Chapman	13	csw 28/130N/106W Little Missouri Field Bowman Cnty, ND	Eagle (1,215-1,342)	1,560 PB: 1,420	24,612 gal water, 75,000 lb sand	DG, no cores or tests, operator has 4 additional Eagle completions in locale.	368

Table 2-4 Summary of Active Wells and New Locations — Northern Great Plains Province

DATE	OPERATOR	WELL NAME	MAP INDEX NO.	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 9-4-79	Sugar Creek Resources	1-3 BN- Pickard Brothers	1	nesw 3/4N/61E Cedar Creek Field Fallon Cty, MT	Eagle (2,000)	D, operator has 1 other Eagle test in this field.
FR: 9-19-79	Orlyn Terry	28-1 Federal	2	swsw 28/7S/59E Wildcat Field Carter Cty, MT	Muddy (1,700)	WF, operator has 2 additional Muddy tests in the area.
FR: 7-30-79	Jerry McCutchin, Jr.	2-16 Harrison- State	3	cse 16/15N/3E Cady Creek Field Harding Cty, SD	Eagle (2,800)	D, operator has 1 Greenhorn and 5 Shannon tests in this area.
FR: 7-20-79	J. Burns Brown	17-15 Federal	4	sese 17/26N/16E Unnamed Field Chouteau Cty, MT	Eagle (2,500)	D, operator has 3 additional Eagle tests in this locale.
FR: 8-13-79 SP: 8-11-79	Balcron Oil	1-10 Van Dyken	5	sese 10/29N/2W Wildcat Field Pondera Cty, MT	Bow Island (700)	WF, 785 TD. . . WOCT, operator has 4 other Bow Island tests in Ledge Field.
FR: 8-22-79	Stroock et al	Lisco & Stroock	6	nesw 30/30N/3W Wildcat Field Pondera Cty, MT	Bow Island (1,600)	WF, operator has 1 other Bow Island test in this locale.
FR: 6-26-79	Tricentrol U.S.	10-10 Hofeldt	7	nwse 10/30N/18E Tiger Ridge Field Blaine Cty, MT	Eagle (1,350)	D, operator has 6 other Eagle tests in this locale.
FR: 2-19-79 SP: 7-10-79	Montana Dakota Utilities	966 Smith	8	neww 13/31N/43E Bowdoin Field Valley Cty, MT	Bowdoin- Phillips (1,400)	D, 1,200 TD, 1,166 PB . . . WOCT.
FR: 9-4-79	Marquis Petroleum	26-1 McCarter	9	nene 26/32N/2E Wildcat Field Toole Cty, MT	Bow Island (1,200)	WF, operator has 1 additional Bow Island test in the area.
FR: 6-25-79 SP: 6-24-79	J. Burns Brown	25-32-18 Ramberg	10	senw 25/32N/18E Black Coulee Field Blaine Cty, MT	Eagle (1,500)	D, Drilg . . . no depth reported. Operator has 6 other Eagle tests in this locale.
FR: 7-11-79	Falcon- Colorado Exploration	1-27 Bell	11	swsw 27/33N/34E Swanson Creek Field Phillips Cty, MT	Phillips (1,700)	D, operator has 5 additional Phillips tests in the area.
FR: 8-21-79	Texas Oil and Gas	1-S Leonard A. Miller	12	swsw 20/34N/17E Wildcat Field Hill Cty, MT	Eagle (1,700)	WF, operator has 1 other Eagle wild- cat in the area.
FR: 8-30-79	Webb Resources	25-13 State	13	swsw 25/37N/4W Fitzpatrick Lake Field Toole Cty, MT	Bow Island (1,860)	D, operator has 4 other Bow Island tests in the area.
FR: 6-4-79 SP: 8-26-79	J. J. C. Paine & Associates	2-14 BLM	14	cnw 4/129N/106W Little Missouri Field Bowman Cty, ND	Eagle (1,500)	D, 1,410 TD . . . WOCT, operator has 10 additional Eagle tests in this locale.

Figure 2-3 Wells Completed and Staked, USGS Designated Core Areas, Northern Great Plains Province (refer to Tables 2-3 and 2-4)

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3. Greater Green River Basin

3.1 CORE PROGRAM

To assist in assessing the resource potential within the Greater Green River Basin, the USGS recommended core acquisition in the following areas (see Figure 3-1):

Area A

The crest of the Wamsutter Arch in Sweetwater and Carbon Counties, the Northern edge bordering on the Red Desert Basin and the southern edge occupying 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 contribution from the Mesaverde and Fort Union.

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, R112W to R114W and T36N to T39N.

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

The core sites contain thick sections of tight, but generally untested gas sands, in Upper Cretaceous and Tertiary formations.

In the Greater Green River Basin, Colorado Interstate Gas Exploration was contacted, but declined the coring of their Haystack Unit No. 2-27-14-96 well in Sweetwater County, Wyoming. Also in Sweetwater County, Pacific Transmission Supply Company has been contacted in regards to coring their well No. 3-10A Federal in the Red Desert sub-basin and a contract is pending. Cotton Petroleum turned down a coring proposal for wells in Sweetwater County because of possible high pressures, but will be interested in future proposals. Yates Petroleum declined a proposal, but would like to discuss future wells. Texas Oil and Gas is considering a proposal. Table 3-1 is a summary of wells located in the core areas and Figure 3-1 shows the location of these wells.

Table 3-1 Summary of Wells Located in USGS Designated Core Areas — Greater Green River Basin

DATE	OPERATOR	WELL NAME	MAP INDEX NO.	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
FR: 6-25-79	CIG Exploration	2-27-14-96 Haystack Unit	1	sene 17/14N/96W Haystack Field Sweetwater Cnty, WY	Mesaverde (16,500)			WO, operator has 1 additional Mesa-verde test in locale.	
FR: 12-4-78	Davis Oil	1 Coronet Federal	2	cse 8/18N/92W Creston Field Carbon Cnty, WY	Mesaverde (9,800)			WO, SUS, located in Core Area A. Operator has 3 additional wells in locale.	
FR: 6-25-79	Amoco Production	9-7 Tierney II Unit	3	csw 7/19N/93W Wildcat Field Carbon Cnty, WY	Mesaverde (10,155)			WF, located in Core Area A. Operator has 35 additional wells in immediate area.	
FR: 8-29-79	Amoco Production	1 Champlin-201 Amoco-B	4	w/4sw 9/21N/95W Wildcat Field Sweetwater Cnty, WY	Mesaverde (10,500)			WF, located in Core Area A. Operator has 3 additional wildcat wells in area.	
FR: 6-25-79	Pacific Transmission Supply	3-12 Federal	5	nwsW 12/22N/92W Wildcat Field Sweetwater Cnty, WY	Mesaverde (13,550)			WF, located in Core Area A. Operator has 3 additional wildcat wells in area.	
SP: 11-18-78 CP: 7-10-79	Energetics Incorporated	10-29 Federal	6	nwnw 29/27N/111W Bird Canyon Field Sublette Cnty, WY	Bear River (9,693-9,730)	9,756 PB: 9,874	64,700 gal gel 79,000 lb sand	DG, no cores or tests. Located in Core Area B2. Operator has 5 additional wells in immediate locale.	4,400

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

	NO. OF WELLS					Producing Horizons in MCFD												
	Wildcats		Development		Total	Fort Union	Lance	Lewis	Undifferentiated	Mesaverde				Frontier	Arapahoe	Bear River	Commenced	Total
	D&A	Disc.	D&A	Prod.						Almond	Edison	Blair						
2nd Quarter 1977	13	21	6	10	50	4,640	0	11,633	3,651	5,444	500	0	32,924	0	0	0	58,792	
3rd Quarter 1977	18	13	6	19	56	4,813	0	19,695	16,929+ 25 BC	2,871	0	0	9,016	0	0	0	53,824+ 25 BC	
4th Quarter 1977	20	13	10	31	74	450	1,026	9,218	19,156	17,001	3,982	1,298	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	8,603	400	0	1,500 ¹	18,190	
2nd Quarter 1978	7	6	3	27	43	0	0	11,020	14,304	6,994	0	0	5,179	0	0	4,239 ²	45,595	
3rd Quarter 1978	18	15	3	27	63	449	53	5,504+ 37 BC	16,999+ 69 BC	11,432	536	0	21,268+ 26 BC	0	0	10,048 ²	66,289+ 132 BC	
4th Quarter 1978	18	12	13	26	69	1,925	0	20,388	5,070	8,690	1,199	0	20,969	0	0	789 ⁴	57,831	
1st Quarter 1979	10	12	6	30	58	994	0	9,378 ⁵	6,269 ⁷	2,029	1,320	0	21,234 ⁸	0	0	2,137 ⁵	43,371	
2nd Quarter 1979	5	9	6	28	48	0	0	13,445 ³	12,012 ⁵	5,630	0	0	14,871	0	0	0	45,958	
3rd Quarter 1979	8	4	5	33	50	0	0	10,745	10,874	10,040	1,643	0	14,182	0	5,896	0	53,380	

1. Lewis/Almond

2. Frontier/Bear River

3. IPF not available for one well

4. Lance/Lewis

5. Lewis/Lance - 789

Mesaverde/Edison - 821

Lance/Fort Union - 499

Lewis/Hilliard - 28

6. IPF not available for two wells

7. IPF not available for three wells

8. IPF not available for four wells

* Data compiled from P.I. Rocky Mountain Region Report "Completions"

3.2 DRILLING ACTIVITIES

In this quarter, new gas production from Upper Cretaceous and Tertiary horizons totalled 53,380 MCFD, up 14 percent from last quarter. The Frontier Formation contributed 27 percent of the new gas for the quarter, the Lewis Formation and undifferentiated Mesaverde Group contributed 20 percent each, the Almond produced 19 percent of the total, the Bear River produced 11 percent and the Ericson contributed 3 percent.

Fifty wells were completed this quarter. Thirty-three new development wells were producing by the quarter's end, with 5 wells D&A. Four wildcat wells were producers and 8 were D&A. The producing horizons and a summary of drilling activities are listed in Table 3-2. Summaries of Greater Green River completed wells, active and newly located wells appear in Tables 3-3 and 3-4, respectively. Figure 3-2 shows the locations of these wells.

Table 3-3 Summary of Wells Completed—Greater Green River Basin

DATE	OPERATOR	WELL NAME	MAP INDEX NO.	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
SP: 6-1-79 CP: 7-28-79	Sun Gas	29-1 Federal-Fox	1	nwnw 29/8N/90W Craig North Field Moffat Cnty, CO	Lewis (2,918-3,277)	3,630	37,100 gal emul 64,000 lb sand	DG	312
SP: 8-4-78 CP: 8-20-78	CIG Exploration	1-2-8-91 Visintainer Sheep	2	nesw 2/8N/91W Blue Gravel Field Moffat Cnty, CO	5,200 test	4,807		WO, D&A, no cores.	
SP: 7-9-79 CP: 7-21-79	Anadarko Production	1 Cottonwood Gulch-Federal-B	2	nene 26/8N/91W North Craig Field Moffat Cnty, CO	Lewis (3,900)	4,017		D, D&A, operator has 7 additional wells in locale.	
FR: 7-11-79	Cotton Petroleum	18-1 Hammond Federal	3	e/snw 18/21N/94W Siberia Ridge Field Sweetwater Cnty, WY	Mesaverde (10,600)			D, abn location.	
SP: 2-13-77 CP: 5-17-79	Amoco Production	1 Champlin 336 Amoco-A	4	nesw 21/17N/94W Wildcat Field Sweetwater Cnty, WY	Mesaverde (12,800)	11,556	Acidized 3 times- total 227,925 gal, fract twice, total 464,205 gal emul 1,034,334 lb sand	WF, D&A, operator has 10 additional wells in immediate locale. Largest fracture reported in quarter.	
SP: 1-17-79 CP: 4-22-79	C&K Petroleum	1 Flying W	5	nwne 26/21N/ 113W Wildcat Field Lincoln Cnty, WY	Frontier test (11,350)	11,593		WF, D&A.	
SP: 2-28-79 CP: 7-31-79	Davis Oil	3 Picket Lake Unit	6	nesw 18/26N/96W Picket Lake Field Sweetwater Cnty, WY	Lewis (13,716- 13,736)	14,000	178,650 gal emul 191,250 lb sand	WOE, Lewis Extension-Picket Lake. Operator has 7 additional wells in immediate locale.	3,174
SP: 5-15-78 CP: 12-18-78	Belco Petroleum	26-9 Unit	7	nws 9/27N/113W North Labarge Field Sublette Cnty, WY	Frontier (6,078-6,717)	6,784	Acidized w/2,500 gal	DG, no cores or tests. Operator has 13 additional drillings in locale.	244

Figure 3-2 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 Active Wells and New Locations—Greater Green River Basin

DATE	OPERATOR	WELL NAME	MAP INDEX NO.	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 9-17-79	Conoco Inc.	1 Government	1	sww 21/9N/89W Wildcat Field Moffat Cnty, CO	Lewis (4,165)	WF, operator has 1 additional wildcat well in area, completed D&A.
FR: 9-4-79	Sinclair Oil	12 Blue Gap II Unit	2	nesw 17/15N/93W Wildcat Field Carbon Cnty, WY	Mesaverde (11,500)	WF, operator has 4 additional development wells in locale.
FR: 5-29-79 SP: 8-11-79	Amoco Production	1 USA- Amoco-U	3	swne 18/17N/95W Wildcat Field Sweetwater Cnty, WY	Mesaverde (12,700)	WF, TD 11,800, fishing. Operator has 9 additional tests in the area.
FR: 5-8-79 SP: 9-3-79	Pacific Transmission Supply	3-10 Federal	4	sesw 10/19N/93W Echo Springs Field Carbon Cnty, WY	Mesaverde (9,725)	D, drlg @ 7,428 ft. Operator has 5 additional Mesaverde tests in this locale.
FR: 5-11-79 SP: 7-3-79	Marathon Oil	15 Unit	5	nesw 32/20N/112W Wilson Ranch Field Lincoln Cnty, WY	Frontier (11,350)	D, TD 11,490, WOCT. Operator has 2 additional Frontier tests in locale.
FR: 9-17-79	Rainbow Resources	1-10 Federal	6	nesw 10/23N/114W Wildcat Field Lincoln Cnty, WY	Hilliard (6,500)	WF, operator has one additional Hilliard well in locale.
FR: 9-18-79	Woods Petroleum	3 Lost Valley Unit	7	nesw 20/25N/99W Wildcat Field Sweetwater Cnty, WY	Mesaverde (13,000)	WF, operator has 3 additional wells in immediate locale.

The largest amount of drilling activity in the Greater Green River Basin is located east of the Rock Springs Uplift in and on the flanks of the Washakie and Red Desert sub-basins. Although the Mesaverde Group continues to command the most WGSP interest, younger units are the objectives in the deeper parts of the sub-basins, including sands in the Lewis and some Tertiary sections. The Wamsutter Arch, separating the Washakie and Red Desert sub-basins, and the Cherokee Ridge, separating the Washakie and Sand Wash sub-basins, are still active areas for exploration. The Mesaverde is the primary producer in the Wamsutter Arch, and the Tertiary, Wasatch and Ft. Union are the primary producers for the Cherokee Arch. Amoco Production, Kemmerer Coal, Pacific Transmission Supply Company, Getty Oil and Davis Oil are some of the most active companies with drilling objectives of interest to the WGSP. In Colorado's Sand Wash sub-basin, which is of interest to the WGSP, Tenneco Oil, Davis Oil, Northwest Exploration and Champlin Petroleum are seeking Lewis and Mesaverde production. The Green River Basin Proper has not been particularly active for the WGSP. Most activity has been out of the basin with Frontier as the objective section.

Rainbow Resources is active on the north end of the Rock Springs Uplift, which separates the Red Desert from the Green River sub-basin. This is also an area of interest to the WGSP for Tertiary and Mesaverde section. Figure 3-3 is a stratigraphic correlation chart of the Greater Green River, Piceance and Uinta Basins.

The largest fracture job reported for the quarter was performed on Amoco Production's 1 Champlin 336 Amoco-A well, Sec. 21, T17N, R94W, Wildcat Field, Sweetwater County. The well was completed D&A after being acidized three times with a total of 227,925 gal and fractured twice with a total of 464,205 gal of emulsion and 1,034,334 lb of sand.

Figure 3-3. Stratigraphic Correlation Chart of Greater Green River, Piceance and Uinta Basins

Modified from Symposium
on Deep Drilling Frontiers
in the Central Rocky Mountains,
R.M.A.G., 1975, Edited by
Dudley W. Bolyard

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4. Uinta Basin

4.1 CORE PROGRAM

The Uinta Basin is located in northeastern Utah 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, R7E to R9E; in Carbon County, T11S and T12S, R7E to R13E.

Area B

Duchesne and Uintah Counties — T3S to T4S, R2E to R2W and parts of T8S, R16N to R18W.

Area C

Uintah County — T8S and T9S and R23E to R25E.

Area D

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

Within the core areas, newly staked locations are monitored so that operators can be contacted concerning participation in the WGSP core program. Burton-Hawks and Chandler Resources declined core proposals for the Uinta Basin. Mapco, Inc. was contacted and discussions continued concerning the coring of a Wasatch-Mesaverde interval from Mapco RBU No. 11-17F well, Sec. 17, T10S, R20E, Uinta County, Utah. Spud in is expected around mid-October, with coring planned around the first of November.

To supplement outcrop studies, a 6-1/2 in. diameter core hole (DOE/WGS-GC-1) is being drilled by C K GeoEnergy through about 1,200 ft of the non-marine Mesaverde Group in the Westwater Canyon area of the Book Cliffs in eastern Utah (Sec. 16, T17S, R24E, Grand County). The core hole is located on a ridge and the section being cored (lower Tuscher, Farrer, Upper Neslen), is exposed along the adjacent valley walls. There was excellent core recovery and 4,400 lbs of 3 in. diameter core was shipped to the USGS in Denver for description. An additional 600 ft of core will be cut and the hole logged. This work is being done under contract to DOE for characterization of lenticular sands.

Table 4-1 is a summary of Uinta Basin core area wells and Figure 4-1 shows their locations.

4.2 DRILLING ACTIVITIES

Twelve development wells were reported completed during the third quarter of 1979 in Upper Cretaceous and Tertiary horizons of interest to the WGSP. There was no wildcat activity. All twelve development wells were producers. (Abandoned locations are not listed in this report).

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

Table 4-1 Summary of Wells Located in USGS Designated Core Areas — Uinta Basin

DATE	OPERATOR	WELL NAME	MAP INDEX NO.	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
FR: 9-24-79	Pacific Transmission Supply Company	23-17 Federal	1	nsw 17/8S/23E Wildcat Field Uintah Cnty, UT	Mesaverde 8,800			W, located in Core Area C. Operator has one additional Mesaverde test in this immediate area.	
FR: 9-19-79	Belco Petroleum	47-30 Chapita Wells Unit	2	nene 30/9S/23E Natural Buttes Field Uintah Cnty, UT	Wasatch 7,386			D, located in Core Area C. Operator has 2 additional Wasatch tests in this core area.	
FR: 4-26-78	Mapco Incorporated	15-17E RBU	3	swse 17/10S/19E Island Field Uintah Cnty, UT	Mesaverde 8,430			D, Sus, located in Core Area D. Operator has 7 additional Mesaverde tests in this immediate locale.	
FR: 7-20-79	Chancellor & Ridgeway	4 Rat Hole Unit	4	sesw 13/14S/25E Wildcat Field Uintah Cnty, UT	Mancos 5,620			W, located in Core Area D. Operator has one additional Mancos test in this core area.	
FR: 9-24-79	Coseka Resources	3-11-15-21 Wolf Unit-Federal	5	sesw 11/15S/21E Wildcat Field Uintah Cnty, UT	Morrison 10,425			W, located in Core Area D. Operator has 10 additional tests in this core area.	

New gas production totalled 22,621 MCFD for the third quarter, 1979, with all of the production from the Wasatch horizon. New gas production was down 28 percent from the second quarter, 1979. A summary of drilling activities is shown in Table 4-2.

Principal development activity was in the Natural Buttes-Chapita Wells area with Colorado Interstate Gas Exploration and Belco Petroleum being the most active operators.

The largest fracture treatment reported during the third quarter was performed on Wexpro's No. 9 Island Unit well, Sec. 11, T10S, R19E, Uintah County. It was treated with 3,000 gal acid, 76,000 gal gel and 186,000 lb sand and produced 5,247 MCFD.

Summaries of completed wells, and active and newly located wells appear in Tables 4-3 and 4-4, respectively. Figure 4-2 shows the location of these wells.

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

	NO. OF WELLS					Producing Horizons in MCFD						
	Wildcats		Development		Total	Green River	Wasatch	Mesaverde	Mancos	Mancos B	Commingled	Total
	D&A	Disc	D&A	Prod.								
2nd Quarter 1977	7	2	0	6	15	93	3,553	1,743	0	0	0	5,389
3rd Quarter 1977	5	2	1	8	16	not available	12,611	0	0	0	0	12,611
4th Quarter 1977	4	0	2	14	20	0	21,901	1,850	0	0	1,400 ¹	25,151
1st Quarter 1978	5	1	0	6	12	0	8,182	0	0	0	0	8,182
2nd Quarter 1978	1	1	1	15	18	0	19,411	329	314	0	750	20,804
3rd Quarter 1978	3	1	0	8	12	1,800	4,214 ²	2,918	0	288	15,742	24,962
4th Quarter 1978	1	4	1	22	28	1,692	2,084 ³	3,679	0	0	0	7,455
1st Quarter 1979	3	4	1	40	48	3,431 ¹	35,011 ⁴	662 ²	0	204	3,960 ⁴	43,268
2nd Quarter 1979	0	8	2	17	27	0	31,033 ²	500 ²	0	0	0 ²	31,533
3rd Quarter 1979	3	1	0	12	16	0	22,571 ²	0	0	0	0	22,571

1. Wasatch/Mesaverde
2. IPF not available for one well
3. IPF not available for eight wells
4. Mesaverde/Castlegate - 410
Mesaverde/Wasatch - 3,500
5. IPF not available for four wells

*Data compiled from P.I. Rocky Mountain Region Report "Completions"

Table 4-3 Summary of Wells Completed—Uinta Basin

DATE	OPERATOR	WELL NAME	MAP INDEX NO.	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
SP: 5-4-79 CP: 8-13-79	Continental Oil	35-5 Conoco- Federal	1	nwnw 35/8S/21E Natural Buttes Field Uintah Cnty, UT	Wasatch (5,911-6,483)	7,558 PB: 6,700	Acidized Fractured	DG, no cores or tests. Opera- tor has 2 addi- tional wells in this area.	1,250
SP: 11-26-78 CP: 6-6-79	Belco Petroleum	51-31-B Natural Buttes Unit	2	swse 31/9S/21E Natural Buttes Field Uintah Cnty, UT	Wasatch (5,068-6,838)	6,956 PB: 6,873		DG, no cores or tests. Opera- tor has 25 addi- tional tests in this area.	734
FR: 4-26-78	Mapco Incorporated	5-11D RBU	3	swnw 11/10S/18E Uteland Butte Field Uintah Cnty, UT	Mesaverde 8,455			D, Sus. Operator has 10 additional tests in this area.	
SP: 12-3-78 CP: 8-6-79	Wexpro	9 Island Unit	4	nwnw 11/10S/19E Island Field Uintah Cnty, UT	Wasatch (6,088-6,151)	6,800 PB: 6,730	Acidized w/3,000 gal. Fract w/76,000 gal gel, 186,000 lb sand	DG, no cores or tests. Largest fract reported this quarter.	5,247
SP: 4-14-79 CP: 6-3-79	CIG Exploration	34-13-10-20 Natural Buttes Unit	5	swne 13/10S/20E Natural Buttes Field Uintah Cnty, UT	Wasatch (5,230-6,576)	6,700 PB: 6,670	Acidized w/3,000 gal. Fract w/76,342 gal water, 150,000 lb sand	DG, no cores or tests. Opera- tor has 25 addi- tional wells in this area.	3,000

Table 4-4 Summary of Active Wells and New Locations—Uinta Basin

DATE	OPERATOR	WELL NAME	MAP INDEX NO.	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 6-29-79	Belco Petroleum	14-34 Stage- coach	1	nenw 34/8S/21E Stagecoach Field Uintah Cnty, UT	Wasatch 7,525	D. Operator has 3 additional Wasatch tests in this locale.
FR: 9-4-79	Pacific Transmission Supply Company	24-22 Federal	2	sesw 22/8S/22E Chapita Wells Field Uintah Cnty, UT	Mesaverde 8,400	WO. Operator has 1 additional Mesa- verde test in this immediate locale.
FR: 9-24-79	Mapco Production	7-25A Federal	3	swne 25/9S/18S Wildcat Field Uintah Cnty, UT	Wasatch 9,300	WF.
FR: 4-26-78 SP: 7-22-79	Mapco Production	7-25B Federal	4	swne 25/9S/19E Natural Buttes Field Uintah Cnty, UT	Mesaverde 8,730	D. TD 9,232 Rng logs. Well name chgd from RBU.
FR: 5-1-79 SP: 7-5-79	Continental Oil	2-6 Ankerpont et al	5	nenw 2/9S/21E Natural Buttes Field Uintah Cnty, UT	Wasatch 7,250	D. TD 7,261, acidized, sdwtrfract, swbg.

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

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5. Piceance Basin

5.1 CORE PROGRAM

The Piceance Basin of northwestern Colorado 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 Fort 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 the 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 (see Figure 5-1):

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 and R97W (below the Wasatch

Area C

Garfield and Mesa Counties, T5S to T8S, R95W in the north tapering down to R98W 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).

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 1979, David M. Munson was contacted, but declined coring a well near Cathedral Bluffs, Rio Blanco County, Colorado. Also in Rio Blanco County, a contract was obtained with Pacific Transmission Supply Company to core and log portions of Mesaverde/ Williams Fork and Mancos "B" in their well No. 22-12 Federal "Barcus Creek", Sec. 12, T1N, R99W. Coring operations began in August with the recovery of 285 ft of Mesaverde core. Seven cores were cut with 98 percent recovery. Gas was not detected from this Mesaverde section. Selected core samples were sealed and sent to Bartlesville Energy Technology Center, Los Alamos Scientific Laboratory and Lawrence Livermore Laboratory for analyses. Coring of the Mancos "B", scheduled for mid-September, was delayed due to encountering an unexpectedly thick Mesaverde interval. Core depth was originally projected to be about 10,500 ft, but was later revised to 11,500 ft.

Core Laboratories, Inc. performed various routine and special analyses on core from the Twin Arrow C&K No. 4-14 well, Rio Blanco County. Special tests included acoustic velocity measurements, capillary pressure tests, formation resistivity factor measurements at various overburden pressures, and formation resistivity index measurements.

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

Table 5-1 Summary of Wells Located in USGS Designated Core Areas — Piceance Basin

DATE	OPERATOR	WELL NAME	MAP INDEX NO.	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
FR: 8-21-79	Teton Energy	23-1 Federal	1	sew 23/1S/98W Wildcat Field Rio Blanco Cnty, CO	Mancos (12,500)			WF, located in Core Area A. Operator has 3 additional wells in the core area.	
FR: 7-26-79	David M. Munson	11-2-99 Federal	2	swnw 11/2S/99W Wildcat Field Rio Blanco Cnty, CO	Mancos (11,000)			WF, located in Core Area A. Operator has 1 additional well in core area.	
FR: 9-11-79	Adolph Coors	1-36 USA-DF	3	swne 36/7S/99W Wildcat Field Garfield Cnty, CO	Mancos (4,000)			WF, located in Core Area C. Operator has 1 additional well in immediate area.	
SP: 5-24-79 CP: 6-19-79	Chandler & Associates	15-29 Pruett	4	swse 29/9S/95W Wildcat Field Mesa Cnty, CO	Corcoran (4,995)	4,995		WF, D&A. Located in Core Area D. Operator has 6 additional wells in locale.	
FR: 7-26-79	Exxon Corporation	1 Federal	5	sese 33/10S/94W Wildcat Field Mesa Cnty, CO	Corcoran (8,500)			WF, located in Core Area D. Operator has 2 additional wells in locale.	
FR: 6-1-79 SP: 7-10-79	Pacific Transmission Supply Company	22-12 Federal	6	senw 12/1N/99W Wildcat Field Rio Blanco Cnty, CO	Dakota (14,500)			WF, Drig 10,142. Located in Core Area A. (See text for more information).	

A summary of core area wells is listed in Table 5-1 and the locations are shown in Figure 5-1.

5.2 DRILLING ACTIVITIES

Third quarter activity was up substantially in the Piceance Basin. Thirty-one wells were reported completed in the Upper Cretaceous and lower Tertiary horizons. Twenty-seven were development wells, with 25 producing and 2 D&A. Of 4 wildcat wells, 1 was a producer and 3 were D&A.

New production for the quarter totalled 22,866 MCFD. A substantial increase in Mesaverde production accounted for the 348 percent increase over the previous quarter. The Mesaverde group provided 39 percent of total production, the Mancos "B" contributed 30 percent, commingled horizons (including Cozzette, Corcoran, Rollins, Mancos B, Mesaverde and Dakota) produced 20 percent and the undifferentiated Mancos provided 5 percent of total production. The quarterly tabulation of production is summarized in Table 5-2.

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

	NO. OF WELLS					Producing Horizons in MCFD										
	Wildcats		Development		Total	Douglas Creek	Wasatch	Fort Union	Undifferentiated	Corcoran	Undifferentiated	Mesaverde		Mancos		Total
	D&A	Disc.	D&A	Prod.										Cozzette/Rollins	Mancos B	Commingled
2nd Quarter 1977	0	0	4	13	17	0	0	0	0	0	1,232	0	555	5,391 ⁵		7,178
3rd Quarter 1977	2	0	5	9	16	0	2	0	0	0	2,585	0	157	183 ⁴		2,927
4th Quarter 1977	1	3	8	41	53	2,000	3,816 ¹	0	1,000	0	4,627	0	4,753 ²	6,657 ^{3a}		22,853
1st Quarter 1978	2	1	0	27	30	0	0	9	3,132	140	3,311	0	2,239 ¹	0		8,831
2nd Quarter 1978	2	1	2	12	17	0	0	0	0	0	0	0	4,491	0		4,491
3rd Quarter 1978	2	4	3	17	26	0	2,151	0	0	0	1,949 ¹	335	3,866	1,774 ⁴		10,075
4th Quarter 1978	12	0	6	22	40	0 ¹	11,891	0	0	0	1,271	1,491	992	3,017 ⁵		18,663
1st Quarter 1979	0	2	5	42	49	0	6,730	0	0	0	5,171 ⁶	0	8,307 ¹	4,004 ^{3b}		24,212
2nd Quarter 1979	1	6	0	15	22	0	0	0	440 ⁷	0	439	0	5,683 ⁷⁻⁸	0		6,562
3rd Quarter 1979	3	1	2	25	31	0	0	0	8,947	0	1,050	0	6,803 ¹	6,066 ⁹		22,866

1. IPF not available for one well.

2. IPF not available for two wells.

3a. Rollins/Cozzette/Corcoran - 4,422
Cozzette/Corcoran - 2,235

3b. Rollins/Corcoran/Cozzette - 1,284
Corcoran/Cozzette - 2,720

4. Cameo/Cozzette/Corcoran - 460
Morapos/Mancos - 481
Rollins/Cozzette/Corcoran - 833

5. Rollins/Cozzette/Corcoran - 183

6. IPF not available for five wells.

7. IPF not available for three wells.

8. Natural Production 2,675

9. Cozzette/Corcoran - 2,537
Rollins/Cozzette/Corcoran - 1,087
Mancos B/Dakota - 2,428
Mancos/Mesaverde - 14

* Data compiled from P.I. Rocky Mountain Region Report "Completions."

The Mesaverde production was mainly from the Plateau and DeBeque Fields in Mesa County. In Rio Blanco County, the Douglas Creek Arch, including the Cathedral Field, was an active area, with the main objective being the Mancos B (Emery).

The largest fracture treatment reported for the quarter was performed on the Fuel Resources Development J-36-2-101-S Federal well, Sec. 36, T2S, R101W, Cathedral Field, Rio Blanco County. The well produced 1,729 MCFD from the Emery after being fractured with 100,800-gal fluid, 400,000 lb sand and 1,080,000 scf nitrogen.

Summaries of completed wells and active and newly located wells are in Tables 5-3 and 5-4, respectively. Figure 5-3 shows the location of these wells.

Table 5-3 Summary of Wells Completed—Piceance Basin

DATE	OPERATOR	WELL NAME	MAP INDEX NO.	LOCATION Sec/T/R	HORIZON (Projected Depth or Producing Interval)	FINAL TD	FRACTURE TREATMENT	COMMENTS	IPF in MCFD
SP: 12-21-78 CP: 7-27-79	Fuel Resources Development	J-36-2-101-S Federal	1	nwse 36/2S/101W Cathedral Field Rio Blanco Cnty, CO	Emery (2,632-2,870)	3,042 PB: 2,979	100,800 gal water 400,000 lb sand 1,080,000 scf nitrogen	DG, no cores or tests. Largest fract reported in quarter. Opera- tor has 11 addi- tional wells in area.	1,729
SP: 6-24-79 CP: 8-13-79	Chandler & Associates	15-33 Stites	2	swse 33/9S/95W Plateau Field Mesa Cnty, CO	Cozzette (4,644-4,673) Corcoran (4,779-4,863)	5,100	Acidized w/750 gal, fract w/41,625 gal water	WOE, comming- led production. Cozzette Exten- sion-Plateau Field. Operator has 3 additional wells in locale.	490
SP: 4-20-79 CP: 7-11-79	Chandler & Associates	2-4 Gunderson	3	nwne 4/10S/96W Plateau Field Mesa Cnty, CO	Corcoran (4,365)	4,500		WO, D&A. No cores or tests. Operator has one additional well in locale.	
SP: 12-7-77 CP: 10-17-78	Adolph Coors	1-32 Acco-Wood	3	sese 32/10S/96W Plateau Field Mesa Cnty, CO	Cozzette (3,402-3,440) Corcoran (3,535-3,588)	4,242	289,125 gal water 522,000 lb sand	DG, no cores or tests. Operator has 5 additional wells in locale.	474
SP: 9-18-78 CP: 4-23-79	Fuel Resources Development	6M Federal	4	nesw 20/2N/96W White River Field Rio Blanco Cnty, CO	Mesaverde (6,170-6,852)	7,548 PB: 7,040	Acidized w/1,596 gal, fract w/6,720 gal water, 25,000 lb sand	DG, no cores or tests.	3,691
CP: 7-4-79	Teton Energy	25-2 Indian Valley-Federal	5	senw 25/3N/97W Wildcat Field Rio Blanco Cnty, CO	Morapos (8,000)	8,000		WF, D&A.	

Table 5-4 Summary of Active Wells and New Locations—Piceance Basin

DATE	OPERATOR	WELL NAME	MAP INDEX NO.	LOCATION Sec/T/R	PROJECTED HORIZON (Depth in ft)	COMMENTS
FR: 9-13-79	Adolph Coors	1-20 USA- Philadelphia Creek	1	swnw 20/1S/100W Wildcat Field Rio Blanco Cnty, CO	Mancos 5,500	WF.
FR: 5-18-79 SP: 7-23-79	Fuel Resources Development	P 23-3-101S Federal	2	sese 23/3S/101W Cathedral Field Rio Blanco Cnty, CO	Emery 3,892	D. TD 3,815, ran prod csg, fract, F tstg. Operator has 12 additional wells in immediate locale.
FR: 7-9-79	Northwest Exploration	7 Texas Creek	3	swne 15/3S/103W Wildcat Field Rio Blanco Cnty, CO	3,500 test	WF. Operator has 6 additional tests in immediate locale.
FR: 10-26-78 SP: 2-24-79	Northwest Exploration	2 Clough	4	sesw 21/6S/94W Rulison Field Garfield Cnty, CO	Mancos 8,700	WOE, TD 8,600, ran prod csg, perf, acidized. Mesaverde prod zone, holding for data.
FR: 7-11-79	Norris Oil	9-1 Federal	5	nenw 9/10S/97W Roberts Canyon Mesa Cnty, CO	Corcoran 2,890	WS. Operator has 3 additional Corcoran tests in immediate area.

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