



#3 CARLOS SANDOVAL SW SE 1-34S-62W

CORE DESCRIPTION

Core #1:

SCANNED

Cored 2048 ft. -2068 ft. Recovered 20 ft.

2.1 ft of light to dark gray, med. to fine, cross-bedded sandstone.

1.3 ft of black, very coaly shale becoming arenaceous in the lower 0.7 ft.

16.6 ft of light to dark gray, medium to coarse, cross bedded sandstone.

Has thin coal and shale seams throughout. 90% sandstone, 10% clayey coal, traces pyrite.

Core #2:

Cored 2068 ft. to 2088 ft; recovered 20 ft.

9.0 ft. of light to dark gray, coarse to medium, cross bedded sandstone.

Has coal inclusions up to one inch in diameter and distinct cleavage planes made by coal dust. 80% sandstone, 20% coal.

1.5 ft of black, coaly, arenaceous shale with dull luster. 50% coal, 30% shale, 20% sand.

8.9 ft. of light to dark gray, medium, cross-bedded sandstone, containing coal particles throughout. 80% sandstone, 20% coal.

0.6 ft. of brownish black, very hard siltstone. Trace coal.

Core #3:

Cored 2088 ft - 2138 ft. Recovered 50 ft.

6.3 ft. of brownish black, silty shale; with coal particles and seams.

2.0 ft. of light gray, medium sandstone which fractures around the sand grains. Has particles and thin seams of coal.

1.0 ft. of dark gray shale with coal particles.

38.7 ft. of light gray, coarse, cross-bedded sandstone, having inclusions of coal specks throughout and particles of coal along bedding planes. Very porous. Quartz grains are well washed, rounded and even grained. Occasional 1/4 inch seams of coal. Generally massive and quite hard. No odor or fluorescence.

Core #4:

Cored 2138 ft. to 2174.5 ft. Recovered 36.5 ft.

5.3 ft. of light gray, medium, rounded sandstone.

4.0 ft. of black shale with medium coaly, shaley sandstone at top.

2.7 ft. of light gray, medium sandstone with streaks of coal at top.

2.5 ft. of black, coaly shale.

8.5 ft. of dark gray, medium to fine, coal streaked sandstone.

9.5 ft. of black shale.

2.5 ft of dark gray, medium to coarse, rounded sandstone. Frequent 1/8 inch particles of quartz and obsidian. 5% coal.

0.5 ft. of slickensided sandy shale, slightly coaly. Began losing mud in this zone.

1.0 ft. of light gray, medium, fractured sandstone.

Core #5:

Cored 3651 ft. to 3661 ft. Recovered 10 ft.

2.0 ft. of orange-red, argillaceous limestone.

2.0 ft. of medium gray, dense, tight limestone.

6.0 ft. of reddish-brown shale with blue, crypto-crystalline limestone inclusions (nodules).

Core #6:

Cored 3661 ft. to 3697 ft. Recovered 36 ft.

2.0 ft. of purple-red, argillaceous limestone.

34.0 ft. of orange and orange-red siltstone. Lower 6 ft. is limey and argillaceous. 3777 ft. to 3789 ft. looked saturated with water.

Core #7:

Cored 3703 ft. to 3713 ft. Recovered 10 ft.

10.0 ft. of reddish-brown, argillaceous, hard, tight, very limey siltstone. Upper part contained some beds of limestone. 3% limestone.

Core #8:

Cored 3713 ft. to 3734 ft. Recovered 21 ft.

8.5 ft. of purple and purple-red, medium to coarse, arkosic sandstone, relatively friable, angular to sub-angular and calcitic.

8.5 ft. of reddish brown, argillaceous siltstone. Has gray interbedded limestone.

1.0 ft. of gray, hard, crypto-crystalline limestone with thin beds of siltstone.

3.0 ft. of reddish-brown argillaceous siltstone with limestone nodules.

Core #9:

Cored 3734 ft. to 3747 ft. Recovered 13 ft.

12.5 ft. of purple-red, coarse, arkosic sandstone. Bled gas. ✓

0.5 ft. red-brown, dolomitic and gypsiferous shale.

Core #10:

Cored 3747 ft. to 3757 ft. Recovered 10 ft.

6 ft. of reddish brown, very silty, micaceous shale with thin strata

light green, coarse, clean sandstone, sl. dolomitic.

4 ft. of purple, medium to coarse, arkosic sandstone. Bled gas, wet.

Core #11:

Cored 3757 ft. to 3782 ft. Recovered 25 ft.

6 ft. of reddish-purple and purple, coarse, fairly hard, arkosic sandstone. Appeared wet, bled gas.

0.5 ft. of reddish brown shale.

6.0 ft. of reddish brown, hard, tight, argillaceous siltstone; Fractured.

1.0 ft. of dark brown shale with streaks of limestone.

11.5 ft. of reddish brown, hard, tight, quite limey siltstone; layers of argillaceous limestone.

Core #12:

Cored 3782 ft. to 3799 ft. Recovered 17 ft.

6.0 ft. of dark brown, medium to fine, micaceous sandstone.

11.0 ft. of purple arkosic sandstone; bled gas, dry.

Core #13:

Cored 3799 ft. to 3832 ft. Recovered 33 ft.

33.0 ft. of purple, coarse, weathered, arkosic sandstone; somewhat friable, generally cross bedded with paper thin laminae of clay. Bled gas, wet. Interval 3816 - 3820 is quite limey and clayey.

Core #14:

Cored 3832 ft. to 3856 ft. Recovered 24 ft.

3.0 ft. of coarse purple slightly limey, arkosic sandstone; cross bedded, thin laminae of clay.

21.0 ft. of orange-red to reddish-brown, argillaceous siltstone with occasional streaks of gray dolomite.

Core #15:

Cored 3856 ft. to 3882 ft. Recovered 26 ft.

13.5 ft. of reddish-brown, very, very calcareous, massive siltstone with limestone nodules; tight.

4.0 ft. of chocolate brown, silty shale; contains 5% nodular, finely crystalline limestone.

8.5 ft. of reddish-brown, argillaceous siltstone; gray, green and purple in places; hard and very limey; shaley near bottom.

Core #16:

Cored 3882 ft. to 3932 ft. Recovered 50 ft.

- 30 ft. of orange and reddish-brown, argillaceous siltstone.
- 1 ft. gray, hard, dense limestone.
- 16.5 ft. reddish-brown siltstone with nodular limestone; 20% limestone.
- 0.5 ft. of dense, blue-green limestone.
- 2.0 ft. orange-red siltstone.

Core #17:

Cored 3932 ft. to 3971 ft. Recovered 39 ft.

- 2.0 ft. of dark reddish-brown very, very limey shale.
- 1.0 ft. of greenish-gray, slightly sandy, crypto-crystalline limestone.
- 33.0 ft. of orange-red to reddish-brown, crypto-crystalline argillaceous limestone and dolomite; slightly silty, streaks of gray limestone.
- 3.0 ft. of chocolate brown, silty, very argillaceous and very calcareous shale.

Core #18:

Cored 3971 ft. to 4020 ft. Recovered 49 ft.

- 3.0 ft. of chocolate brown shale interstratified with blue-green shale and siltstone.
- 29.0 ft. of reddish-brown and orange-red argillaceous siltstone grading to silty shale in places; generally very, very dolomitic.
- 13.0 ft. of purple-red, traces of green, fine to coarse, angular, very argillaceous; arkosic sandstone. Much of aggregate is mica. Non-calcareous. Bedding not discernable.
- 3.0 ft. of reddish-brown, platy, cross-bedded shale.
- 1.0 ft. of orange dolomite interstratified with brown shale.

Core #19:

Cored 4020 ft. to 4043 ft. Recovered 23 ft.

- 8.0 ft. of interstratified chocolate brown and green shale with 50% orange-red and gray, nodular limestone. Fluorescence at 4020½ due petroleum residue (dead oil stain).
- 11.0 ft. of purple-red and purple-pink, medium to coarse, very micaceous, cross-bedded, arkosic sandstone. Fair porosity. Bled gas.
- 2.0 ft. of reddish-brown shale. 2.0 ft. of reddish-brown and orange-red argillaceous dolomite.

Core #20:

Cored 4043 ft. to 4051 ft. Recovered 8.0 ft.

- 1.0 ft. of greenish-gray, medium grained, nodular limestone interbedded with red sandy shale, 30% shale. Samples of this material is fluorescent (yellow) due to oil residue.

7.0 ft. of alternate clay and limestone (50-50). Brick red clay with grayish brown and orange red, nodular, slightly arenaceous limestone. Yellow fluorescence at 4049 indicated petroleum residue.

Core #21:

Cored 4051 ft. to 4098 ft. Recovered 47 ft.

16.0 ft. of reddish-brown and grayish-green slightly sandy, micaceous limestone. Dull luster, generally opaque; Interbedded with shale.

5.0 ft. of chocolate red shale with thin laminae of green shale and gray green limestone.

16.0 ft. of reddish brown, fine, very calcareous, trashy, dull sandstone, interbedded with gray-green limestone and chocolate brown and green shale.

8.0 ft. of greenish-gray sandy and micaceous dolomite and limestone; interbedded with strata of chocolate brown and blue-green shale. Traces of petroleum residue.

2.0 ft. of purple, fine calcareous, slightly micaceous sandstone.

Core #22:

Cored 4098 ft. to 4148 ft. Recovered 50 ft.

11.0 ft. of purple, medium to coarse, well weathered, arkosic sandstone, micaceous; has streaks of green limestone, some brown and green clay, all very calcareous. Bled gas.

9.0 ft. of reddish brown, silty shale; very calcareous.

12.0 ft. of reddish-purple, medium to very coarse, angular, arkosic sandstone. Slightly to fairly well weathered. Bled gas.

3.0 ft. of reddish-gray, nodular limestone and siderite 30% brown clay. Slight porosity in limestone.

9.0 ft. of rust-red and orange-red, medium to fine, angular, argillaceous sandstone; very calcareous, traces of gray shale. Low porosity but bled gas.

6.0 ft. of reddish-brown, sandy and micaceous shale. 30% limestone nodules.

Core #23:

Cored 4148 ft. to 4168 ft. Recovered 20 ft.

2.0 ft. of reddish-brown, silty shale.

2.0 ft. of gray, blue-green and reddish-brown, coarse, very sandy dolomite.

16.0 ft. of orange, micaceous, fine, dolomitic sandstone. Dolomite content increases downward.

Core #24:

Cored 4168 ft. to 4179 ft. Recovered 11.0 ft.

2.0 ft. of violet-red, fine, dolomitic sandstone; micaceous. Bled gas.

9.0 ft. of orange-red, fine to coarse, sandy, nodular dolomite.
Traces of iron gray dolomite. Interbedded with 30% chocolate brown clay.

Core #25:

Cored 4179 ft. to 4223 ft. Recovered 44.0 ft.

20.0 ft. of orange-red, dolomite and limestone nodules in brown clay (30%).

10.0 ft. of light purple and purple-pink, medium to coarse, fairly clean, calcareous, arkosic sandstone; friable. Faint trace of bedding discernable. Bled gas, wet.

7.0 ft. of reddish-brown clay. Slickensided. Has nodules of limestone (40%).

7.0 ft. of purple-pink coarse, clean, arkosic sandstone; slightly friable. Very slightly calcareous. Bled gas, wet.

Core #26:

Cored 4223 ft. to 4266 ft. Recovered 43 ft.

5.0 ft. of purple-brown, fine, micaceous, dull sandstone.

6.0 ft. of dark lavender, medium to coarse, slightly micaceous, arkosic sandstone; slightly clayey at top. Cross bedding discernable. Bled gas, some porosity.

11.0 ft. of purple-red, medium to fine, argillaceous and slightly micaceous sandstone. Thin strata of clean gray sandstone.

12.0 ft. of orange-red clay containing much nodular limestone and becoming sandy and conglomeritic lower 4 ft. Sub-angular to subrounded pebbles up to 1/2 inch. Considerable slickensiding.

9.0 ft. of orange-red, fine, hard, massive sandstone. Slightly dolomitic.

Core #27:

Cored 4266 ft. to 4306 ft. Recovered 40 ft.

5.0 ft. of orange-red, medium to fine, hard, massive, non-calcareous sandstone.

5.0 ft. of pink and purple conglomerate. Slightly argillaceous and calcareous. Up to 1/4 inch pebbles. Some clay clastics. Bled gas.

14.0 ft. of orange-red medium to fine, argillaceous sandstone. Massive; slightly calcareous.

7.0 ft. of purple, arkosic conglomerate. Some is light green and reddish brown; very calcareous. Bled gas.

1.0 ft. of orange-red silty shale.

Core #28:

Cored 4306 ft. to 4355 ft. Recovered 49 ft.

4.0 ft. of orange-red and salmon pink, medium, slightly argillaceous

sandstone. Slightly to faintly calcareous. Some thin strata of gray sandstone. Bled gas with oil film.

7.0 ft. of light gray, very coarse, arkosic sandstone. The feldspars are only slightly weathered. Grades downward to arkosic conglomerate of light purple color, with 20% shale fragments. Porosity poor to fair. Bled gas with oil film.

8.0 ft. of orange-red, fine, very argillaceous sandstone. Contains nodules of gray limestone. Sandstone becomes medium grained in lower 1 ft.

7.0 ft. of reddish brown, very silty, slightly micaceous, fairly calcareous shale; bled gas.

6.0 ft. of salmon pink, medium to coarse, arkosic sandstone; slightly micaceous; fair porosity, thin oil film; not saturated with water.

Core #29:

Cored 4355 ft. to 4363 ft. Recovered 8 ft.

2.0 ft. of lavender and purple, arkosic sandstone; very micaceous, slightly gypsiferous, distinct bedding, fair to poor porosity; bled gas.

2.5 ft. of reddish-brown, fine, hard, massive sandstone.

2.5 ft. of reddish-brown, sandy and micaceous clay containing 30% limestone in nodular form. Clay shows slickensiding.

Core #30:

Cored 4363 ft. to 4401 ft. Recovered 38 ft.

2.0 ft. of orange-brown, very fine, slightly micaceous, trashy sandstone. Bled gas.

10.0 ft. of grayish-green, salmon pink and purple, coarse to very coarse, quartzitic sandstone; clean, fair porosity, bled gas.

5.0 ft. of purple-red, medium to very coarse conglomerate; bled gas.

20.0 ft. of orange-red, medium to coarsely crystalline limestone.

1.0 ft. of reddish-brown, very calcareous shale.

Core #31:

Cored 4401 ft. to 4451 ft. Recovered 50 ft.

1.0 ft. of dark brown, slightly silty, argillaceous limestone.

26.0 ft. of orange-red and tan, medium grained, nodular limestone; traces and spots of gray, lavender and blu-green; interbedded with 20% arenaceous clay.

18 ft. of orange-red, pink and lavender, fine, argillaceous sandstone.

5.0 ft. of red clay and nodular dolomite; 20% clay, 80% dolomite.

Core #32:

Cored 4451 ft. to 4489 ft. Recovered 38 ft.

2.0 ft. of reddish-brown clay with pea sized, graying brown, angular limestone nodules.

36.0 ft. of orange-red, medium to coarse, arenaceous and slightly micaceous limestone and dolomite; stratification visible in sandy parts. Upper 10 ft. slightly argillaceous.

Core #33:

Cored 5028 ft. to 5030 ft. Recovered 2.0 ft.
2.0 ft. of unweathered, pink granite

WELL DATA SHEET

Colorado
Las Animas County
Sec. 4, T. 34 S R. 62W
680' N of S line and 1980' W of E line.

Edwin W. Pauley - Bruce Sullivan
No. 3 Carlos Sandoval
Garcia area (Wildcat)

Elev. 6247' GL. T. D. 5043' Spd. 4/8/56 Completed 7/3/56

Geological Formations & Electrical Log Tops:

Pierre sh.	surface	San Andres	2954'
Niobrara (Apishipa)	916'	Glorieta ss.	3024'
Timpas lmst.	1636'	Yeso fm.	3328'
Greenhorn lmst.	1804'	Sangre de Cristo	3473'
Graneros sh.	1952'	Madera fm.	
Dakota ss.	2046'	(Upper Clastic)	3584'
Purgatoire fm.	2143'	(Carbonate zone)	4379'
Morrison fm.	2270'	(Lower Clastic)	4593'
Wanakah (Todilto) fm.	2510'	Granite wash	4896'
Entrada ss.	2621'	Weathered granite	4989'
Chinle (Dockum)	2672'	Granite	5026'
Santa Rosa ss.	2852'		

Casing:

Cemented 123' of 10 3/4 inch with 50 sacks.

Drilling Log and Well History:

4/7/56 Moving in and rigging up rotary. Dansforth Drlg. Co. contractor.
4/8/56 Spd. Cmtd. 123' of 10 3/4" csg. with 50 sax.
4/9/56 Began drilling plug at 11:00 P. M.
4/10/56 Drilling at 530' in dark gray shale.
4/11/56 Drlg. at 1020' in shale & lmst.
4/12/56 Drlg. at 1152'. Lost circulation at 1033' and at 1150'
4/13/56 Drlg. ahead slowly and still losing circulation.
4/14/56 Drlg. at 1309' with intermittent circulation.
4/15/56 Drlg. at 1348' with intermittent circulation.
4/16/56 Drlg. at 1437' and still having lost circulation trouble.
4/17/56 Drlg. at 1512' without circulation.
4/18/56 Drlg. at 1594'. Regained circulation at 1514'
4/19/56 Drlg. at 1740 in gray shale and lmst.

RECORD OF DRILL STEM TESTS

No. 3 Sandoval

DST #1 2180 feet to 2231 feet.

Tool open 1 hour 15 minutes. Weak blow of air immediately which slowly decreased. After 40 minutes by-passed tool. Weak blow continued to decrease until end of test. Initial flow pressure, 77 psi. Final flow pressure, 97 psi. 20 minute shut-in pressure 442 psi. Hydrostatic pressure, 968 psi.

DST #2 3641 feet to 3703 feet.

Tool open 2 hours 45 minutes; weak blow first 15 minutes; fair blow next 20 minutes; weak blow thereafter, decreasing to almost nil at the end. Recovered 1200 feet slightly gas cut salt water. Initial flow pressure, 85 psi. Final flow pressure, 813 psi. 20 minute shut-in pressure, 1046 psi. Hydrostatic pressure, 1682 psi. Gas had no odor, may have been CO₂.

DST #3 3508 feet to 3536 feet.

Tool open 2 hours 15 minutes with very weak blow throughout, decreasing to almost nil at end. Recovered 250 feet mud and water. Initial flow pressure, 33 psi; final flow pressure, 135 psi. 20 minute shut-in pressure, 605 psi. Hydrostatic pressure, 1573 psi.

DST #4 3726 feet to 3747 feet.

Tool open 1½ hours. Weak Blow 10 minutes, fair blow thereafter. Recovered 220 feet moderately gas cut salt water. Initial flow pressure 16 psi; final flow pressure, 162 psi; 20 minute shut-in pressure, 1075 psi. Hydrostatic pressure, 1663 psi. Gas had no odor and may have been CO₂.

DST #5 3818 feet to 3832 feet.

Tool open 2 hours 10 minutes. Weak blow and slowly decreasing for the remainder of the test. Recovered 3 feet mud. Initial flow pressure, 2 psi; final flow pressure, 2 psi; 20 minute shut-in pressure, 4 psi; final hydrostatic pressure, 1634 psi.

DST #6 3985 feet to 4043 feet.

Tool open 1 hour 30 minutes. Weak blow and diminishing slowly for the remainder of the test. Recovered 10 feet drilling mud. Initial flow pressure, 26 psi. Final flow pressure, 26 psi. Shut-in pressure, 36 psi. Hydrostatic pressure, 1733 psi.

DST #7 4068 feet to 4168 feet.

Tool open 2 hours 45 minutes. Very, very weak blow throughout duration of test. Recovered 10 feet mud. Initial flow pressure, 50 psi. Final flow pressure, 58 psi. Shut-in pressure, 130 psi. Hydrostatic pressure, 1754 psi.

DST #8 4228 feet to 4363 feet

Tool open $2\frac{1}{2}$ hours. Weak blow diminishing to a very weak blow at end. Recovered 10 feet mud. Initial flow pressure, 62 psi. Final flow pressure, 75 psi. 20 minute shut-in pressure, 95 psi. Hydrostatic pressure, 1892 psi.