APPENDIX G:

REGIONAL STRATIGAPHIC CROSS SECTIONS,

PARADOX BASIN, UTAH

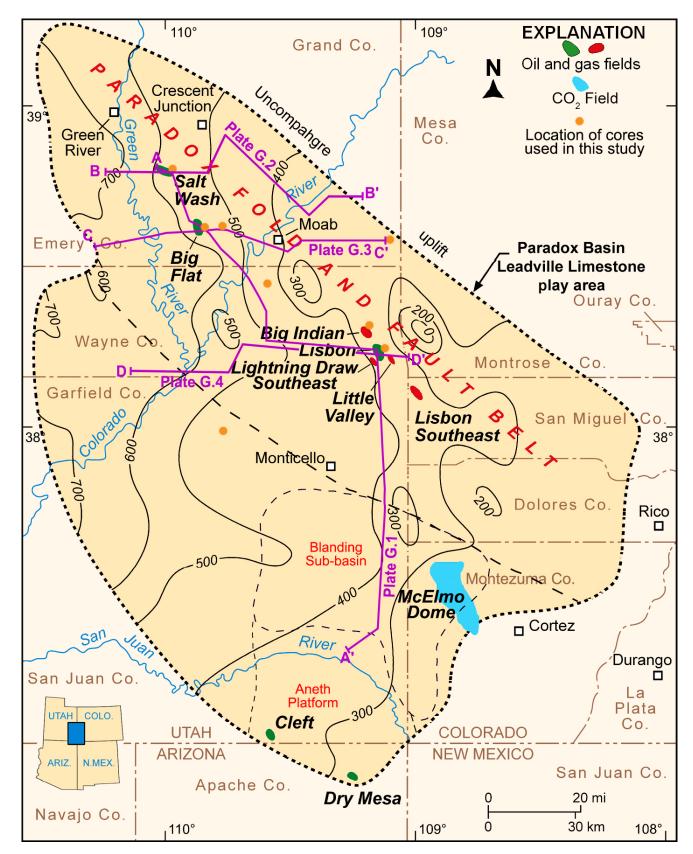


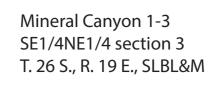
Figure G.1. Thickness of the Mississippian Leadville Limestone, Utah and Colorado; contour interval is 100 feet. Modified from Parker and Roberts (1963). Thicknesses are generalized, and many areas of local fault-related thinning are not displayed. Also shown are oil (green) and gas (red) fields that produce from the Leadville and location of cores from regional exploration wells and Leadville fields used in the study. Locations of stratigraphic cross sections (plates G.1 through G.4) in purple.

Salt Wash 1 NE1/4NE1/4 section 18 NW1/4SW1/4 section 15 T. 23 S., R. 17 E., SLBL&M T. 23 S., R. 17 E., SLBL&M

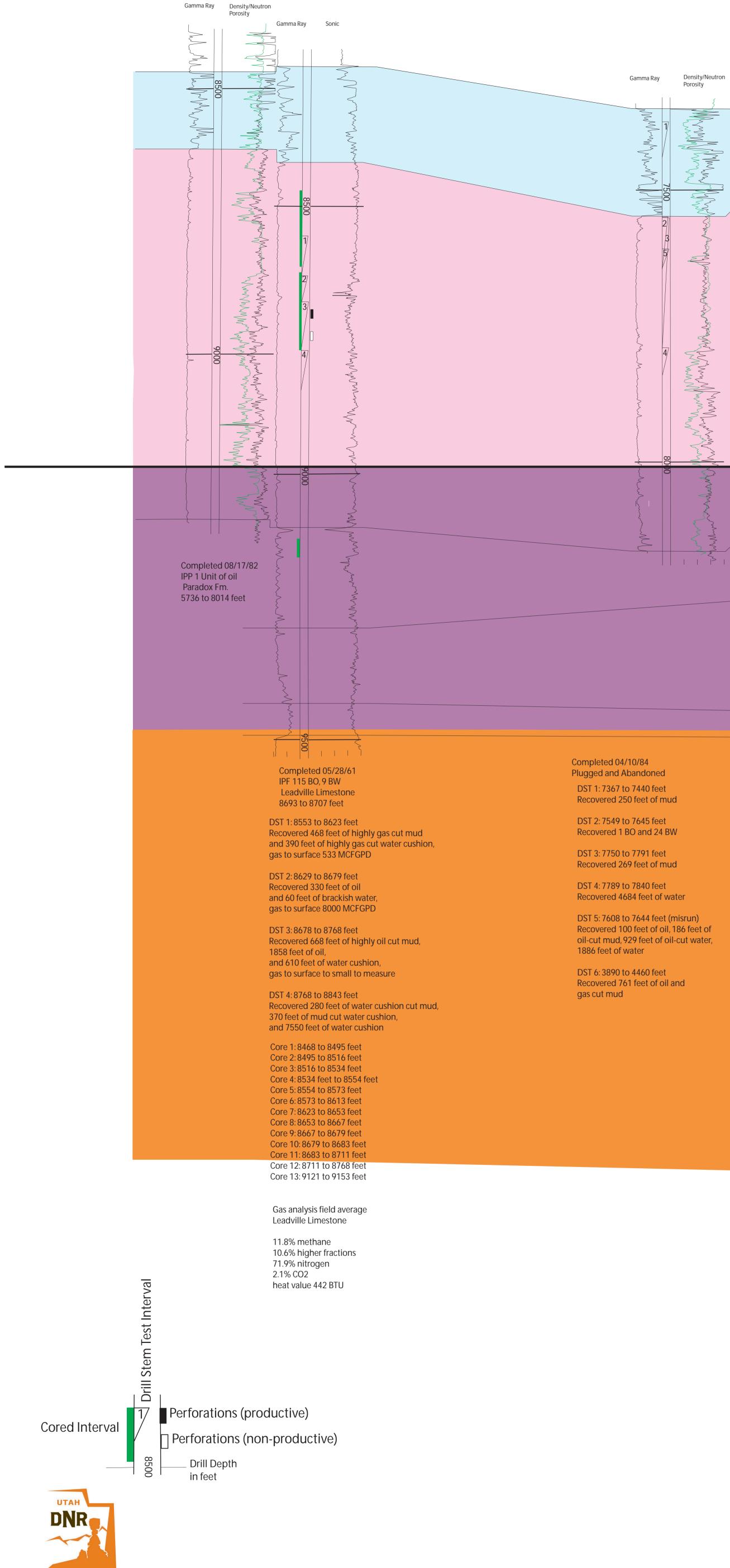
KB 4219 feet

Government 18-2

KB 4383 feet API: 43-019-30679 API: 43-019-10831



KB 5875 feet API: 43-019-31119



GEOLOGICAL SURVEY

Tie with Plate G.3 (C–C') Big Flat Field Big Flat 3 NE1/4NE1/4 section 23 T. 26 S., R. 19 E., SLBL&M

KB 6018 feet API: 43-013-15778 Charles 1 SE1/4NW1/4 section 31 T. 28 S., R. 21 E., SLBL&M KB 4,354 feet

API: 43-037-10860

Hatch Point Field Hatch Point 1 NE1/4SE1/4 section 14 T. 29 S., R. 21 E., SLBL&M KB 4391 feet

API: 43-037-31658

KB 6640 feet

Gamma Ray Density/Neutron Porosity Gamma Ray Neutron Sonic Gamma Ray Gamma Ray Sonic ____ 4500 Completed 1960 Perforated 7714 to 7726 feet Initial Potential 98 BOPD, 81 MCFGPD, 96 BWPD Core 1:6137 to 6187 feet Core 2:7615 to 7674 feet Core 3: 7674 to 7676 feet Core 4: 7676 to 7688 feet Core 5: 7688 to 7726 feet Core 6: 7726 to 7775 feet Core 7: 7775 to 7797 feet Core 8:8432 to 8485 feet DST 1: 4432 to 4445 feet Recovered 110 feet of saltwater DST 2: 4882 to 4950 feet Recovered 5 feet of oil and 90 feet of slightly oil and gas cut saltwater DST 3:5601 to 5701 feet Recovered 70 feet of oil and 20 feet of oil and gas cut mud DST 4:6301 to 6373 feet Recovered 35 feet of mud DST 5:6119 to 6373 feet Gas to surface on 30 minutes, mud to surface in 40 minutes, oil and gas cut mud to surface in 50 minutes, oil and gas cut muddy saltwater to surface in 120 minutes, and saltwater to surface Completed 09/10/92 DST 6: 5470 to 5770 feet - misrun IPF 10 BOPD, 200 MCFGPD, and 1 BWPD Completed 08/25/60 DST 1: 4078 to 4150 feet Molas Fm. and Leadville Limestone IPP 308 BOPD, 149 MCFGPD, Recovered 15 feet of oil, DST 7: 5350 to 5800 feet - misrun Completed 09/03/64 7461 to 7738 feet and no water 231 feet of highly oil and gas cut mud, Plugged and Abandoned McCracken Sandstone 60 feet slightly oil cut mud DST 1: 7231 to 7430 feet DST 8: 6470 to 6606 feet 8254 to 8330 feet

Recovered 86 feet of mud

DST 9: 7404 to 7424 feet Recovered 5 feet of very slightly gas cut mud

DST 10: 7547 to 7610 feet - misrun DST 11: 7547 to 7615 feet Recovered 130 feet of slightly oil cut,

DST 12: 7615 to 7688 feet Recovered 160 feet of highly gas cut mud

DST 13: 7674 to 7726 feet Recovered 600 feet of oil DST 14: 7733 to 7774 feet

highly gas cut, mud

Recovered 5500 feet of gas cut saltwater DST 15:8511 to 8600 feet Recovered 30 feet of mud

Gas analysis field average Leadville Limestone

11.4% methane 16.6% higher fractions 66.4% nitrogen 3.5% CO2 heat value 616 BTU

DST 1: 3535 to 3589 feet

Recovered 345 feet of water cut mud DST 2: 3589 to 3714 feet Recovered 450 feet of mud cut water and 1300 feet of water

DST 3: 4150 to 4193 feet Recovered 70 feet of mud cut water and 3500 feet of water

DST 4: 4243 to 4331 feet Recovered 200 feet mud cut water and 3400 feet of water

DST 5: 5130 to 5204 feet Recovered 15 feet of mud Core 1: 4289 to 4331 feet

Recovered 200 feet of gas cut mud and 1000 feet of gas and oil cut mud

DST 2: 7834 to 7969 feet Recovered 400 feet of water and 542 feet of mud

DST 3: 7393 to 7492 feet Recovered 2079 feet of gas cut mud DST 4: 7582 to 7900 feet Recovered 933 feet of gas cut mud

Recompleted 04/29/61 IPF 40 BOPD, 1500 MCFGPD, and no water 7686 to 7980 feet

Core 1:8275 to 8325 feet Core 2:8327 to 8363 feet Core 3:8363 to 8417 feet Core 4:8452 to 8492 feet Core 5:8492 to 8544 feet Core 6:8544 to 8547 feet Core 7:8547 to 8599 feet Core 8: 8723 to 8774 feet Core 9:8838 to 8891 feet Core 10: 9390 to 9310 feet

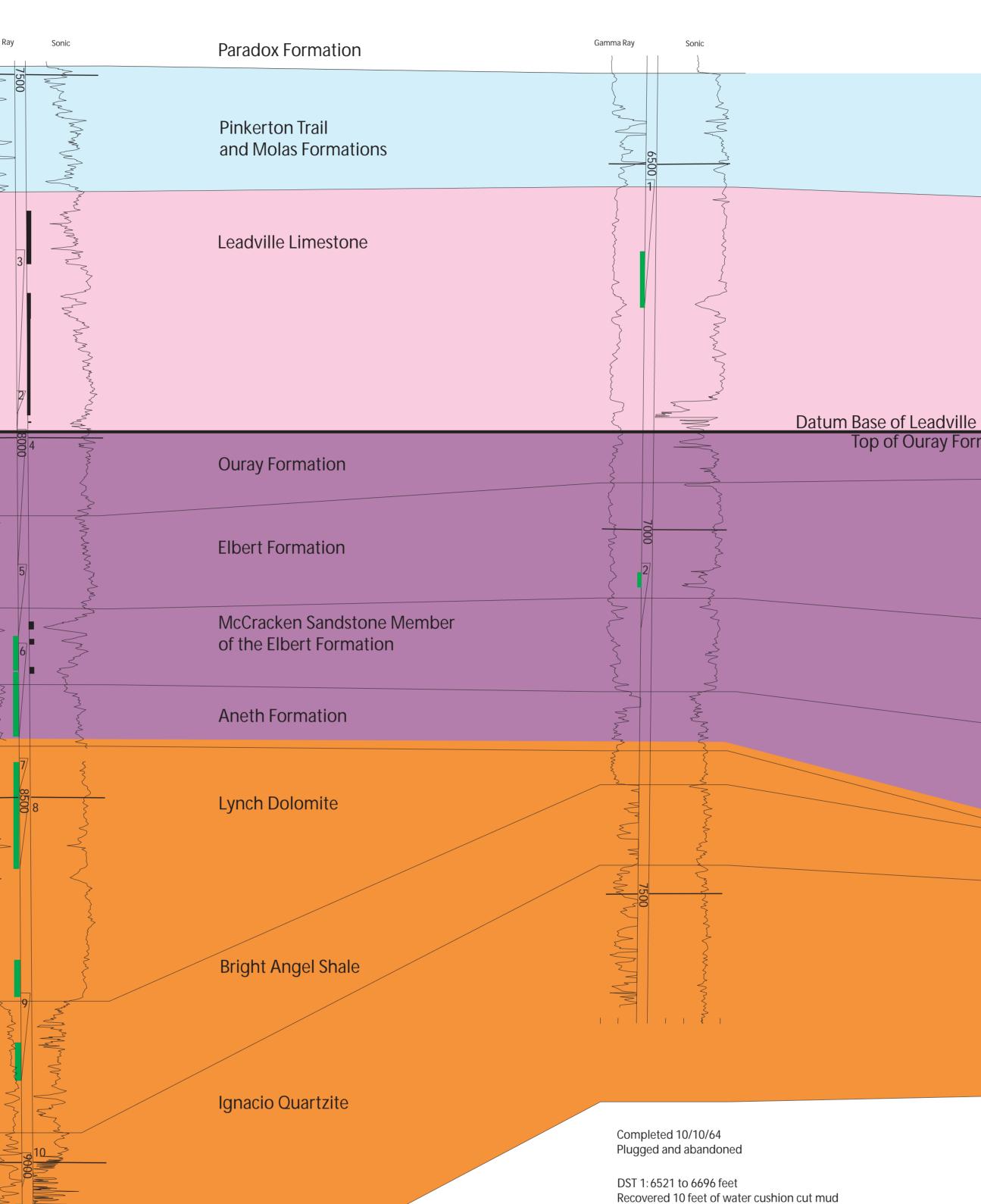
Gas analysis field averages:

Leadville 48% methane 13% higher fractions 24% nitrogen 14% CO2 Heat value 685 BTU

McCracken 61.3% methane 28.9% higher fractions 7.3% Nitrogen 2.1% CO2 heat value 1328 BTU

Tie with Plate G.4 (D–D') Lisbon Field NW Lisbon USA D-810 (A-2) NE1/4SE1/4 section 10 T. 30 S., R. 24 E., SLBL&M

API: 43-037-16471



DST 2: 7045 to 7135 Recovered 175 feet of highly gas cut mud, 40 of gas cut mud

Core 1:6618 to 6641 feet, Leadville Limestone Core 2:6641 to 6696 feet, Leadville Limestone Core 3: 7058 to 7079 feet, McCracken Sandstone

DST 3: 7740 to 7990 feet Water cushion and gas to surface in 5 minutes at 750 MCFGPD, flowed 12 barrels of condensate

DST 2: 7936 to 7968 feet - misrun

DST 4: 7989 to 8177 feet Recovered 1000 feet of gas cut water cushion, 60 feet of gas cut mud gas to surface in 13 minutes at 20 MCFGPD

DST 5:8175 to 8274 feet Recovered 7500 feet of oil, gas to surface in 7 minutes at 15 MCFGPD

DST 6: 8284 to 8417 feet Recovered 7500 feet of oil, 75 feet of oil and gas cut mud gas to surface in 12 minutes

DST 7:8446 to 8492 feet Recovered 190 feet of mud, 20 feet of salty mud

at 10 MCFGPD

DST 8:8499 to 8598 feet Recovered 45 feet of mud DST 9:8770 to 8891 feet

Recovered 350 feet of mud DST 10:8989 to 9035 feet Recovered 90 of mud

DST 11:9070 to 9310 feet Recovered 90 feet of salty mud, 800 of saltwater

Black Steer Canyon Field Black Steer Canyon 12-11 NW1/4NW1/4 section 12 T. 39 S., R. 25 E., SLBL&M

> KB 5245 feet API: 43-037-30678



KB 4530 feet API: 43-037-11256

	Gamma Ray Neutron		AN	
Gamma Ray Sonic	6500 NMM	Pinkerton Trail and Molas Formations	PENNSYLVANIAN	
e Limestone	A A A A A A A A A A A A A A A A A A A	Leadville Limestone	MISSISSIPPIAN	
rmation	7000	Ouray Formation		
	MM MM MM	Elbert Formation	IIAN	
	- Munumun Minumun	McCracken Sandstone Member of the Elbert Formation	DEVONIAN	
	7500	Aneth Formation		
	7	Bright Angel Shale		
	Mr. Marine Marine Marine	Ignacio Quartzite	CAMBRIAN	
Completed 01/09/82			AN	
Plugged and abandoned Perforated 7650 to 7754 feet	Completed 05/28/62 Plugged and abandoned		AMBRI	
tested a show of gas	Open hole production tests, no show of oil or gas 7480 to 7520 feet and 6687 to 6720 feet		PRECAMBRIAN	
DST 1: 6450 to 6650 feet Recovered 10 feet of mud				
DST 2: 6650 to 6840 feet, misrun DST 3: 6666 to 6840 feet				
Recovered 860 feet of highly gas cut mud, gas to surface to small to measure DST 4: 6850 to 7020 feet				
Recovered 1800 feet of gas cut mud and water cushion, gas to surface to small to measure				
DST 5: 7204 to 7425 feet, misrun DST 6: 7204 to 7425 feet				
Recovered 490 feet of mud, 400 feet water cushion cut mud DST 7: 7610 to 7682 feet				
	Recovered 132 feet of mud DST 8: 7700 to 7884 feet			
Recovered 5266 feet of water cushion				

Core 13:9121 to 9153 feet

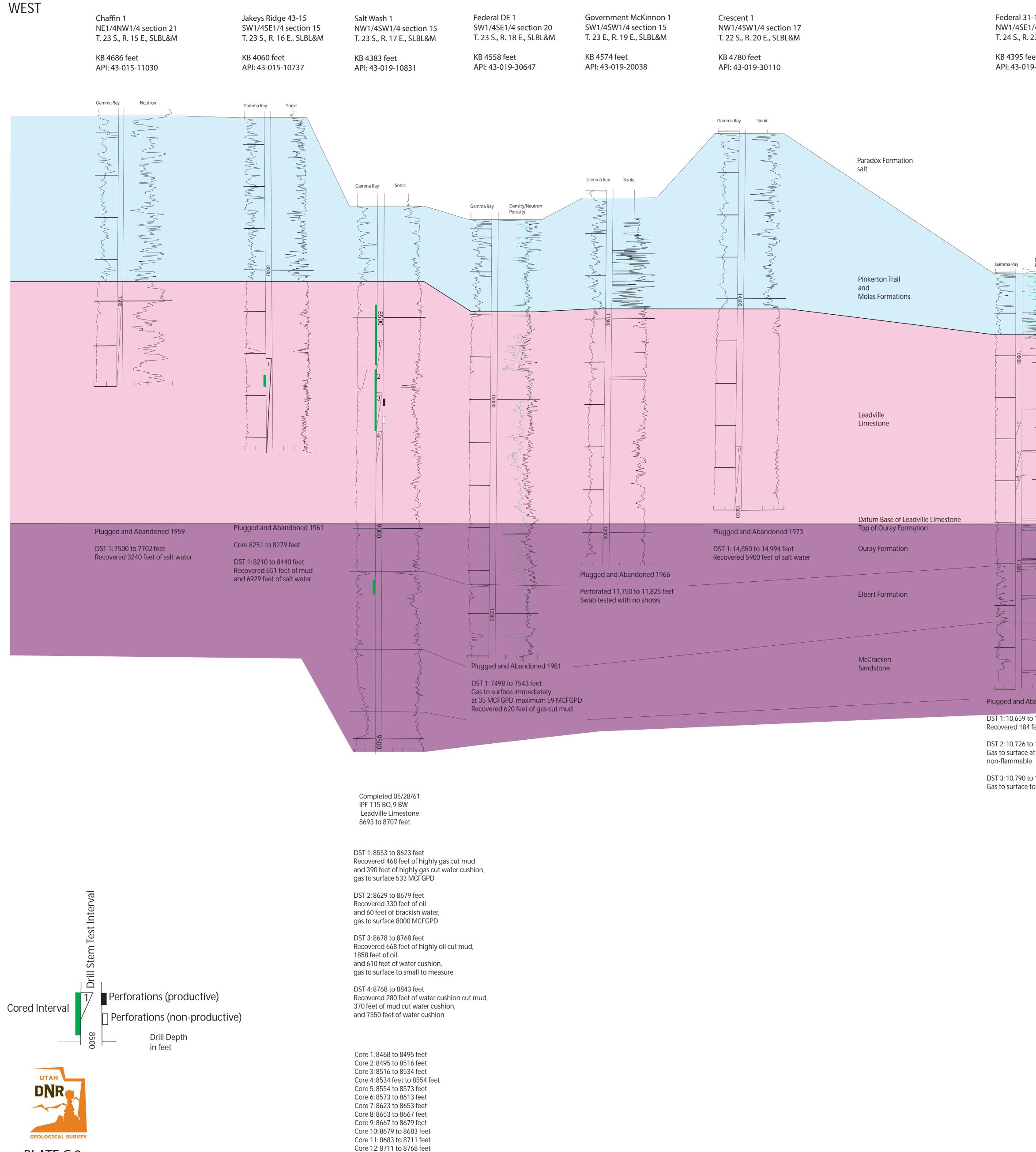


PLATE G.2 STRATIGRAPHIC CROSS SECTION B-B'

Federal 31-1 NW1/4SE1/4 section 31 T. 24 S., R. 23 E., SLBL&M

KB 4395 feet API: 43-019-31180

Onion Creek 2 SW1/4NE1/4 section 13 T. 24 S., R. 23 E., SLBL&M

KB 4569 feet API: 43-019-10905

Onion Creek 1 SW1/4NW1/4 section 18 T. 24 S., R. 25 E., SLBL&M

KB 6652 feet API: 43-019-30937

Sonic Gamma Rav PENNSYLVANIAN Gamma Ray Sonic Density/Neutron Porosity MISSISSIPPIAN N. W. W. W. W. W. 33 Plugged and Abandoned 1983 DST 1: 18,031 to 18,642 feet misrun DST 2 and 3: 18,050 to 18,883 DEVONIAN both misrun DST 4 12,208 to 12,220 feet Recovered 1344 feet of gas cut mud McCracken Sandstone Aneth Formation Plugged and Abandoned 1985 DST 1: 10,659 to 10,693 feet Recovered 184 feet of mud DST 2: 10,726 to 10,781 feet Lynch Dolomite Gas to surface at 1,850 MCFGPD DST 3: 10,790 to 10,825 feet Gas to surface to small to measure CAMBRIAN Bright Angel Shale Ignacio Quartzite \rightarrow

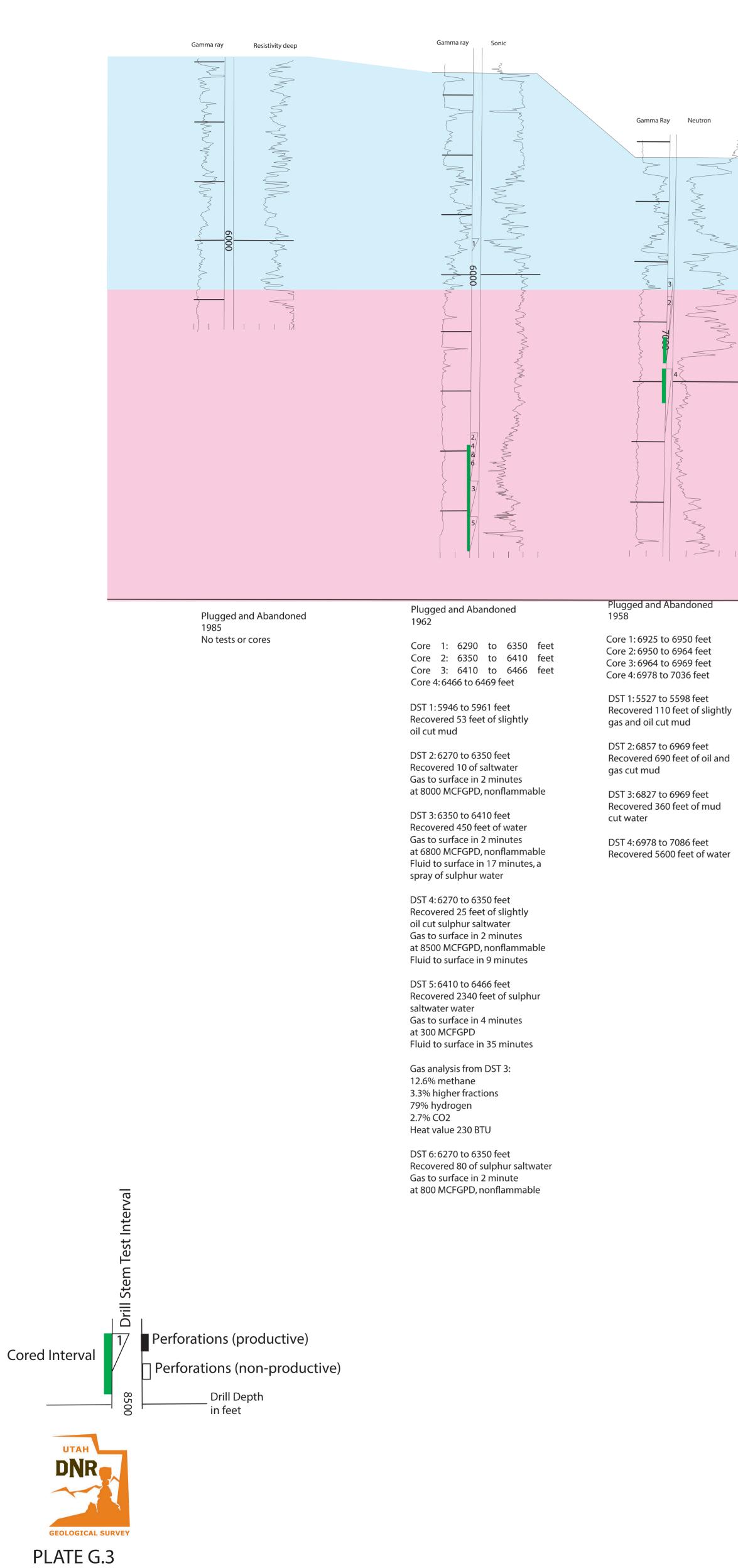
> Plugged and Abandoned 1963 Core 13,355 to 13,365 feet DST 1: 12,949 to 13,150 feet Recovered 20 feet of mud



North Spring Creek 1 NW1/4NE1/4 section 21 T. 26 S., R. 15 E., SLBL&M KB 5083 feet API: 43-015-30205

Bowknot 14-5 SW1/4SW1/4 section 5 T. 26 S., R. 17 E., SLBL&M KB 5051 feet API: 43-015-11181

NE1/4SE1/4 section 7 T. 26 S., R. 18 E., SLBL&M KB 5074 feet API: 43-019-11335



STRATIGRAPHIC CROSS SECTION C-C'

Tie with Plate G.1 (A–A')

Government Mineral Point 1

Big Flat 3 NE1/4NE1/4 section 23 T. 26 S., R. 19 E., SLBL&M

KB 6018 feet API: 43-013-15778

Skyline Federal 8-44 SE1/4SE1/4 section 8 T. 26 S., R. 20 E., SLBL&M KB 6023 feet API: 43-019-30273

Long Canyon 1 SE1/4NW1/4 section 9 T. 26 S., R. 20 E., SLBL&M KB 5794 feet API: 43-019-15925

Cities Service Oil Company Federal Weaver 1 SW1/4NE1/4 section 28, T. 26 S., R. 22 E., SLBL&M KB 4779 feet

API: 43-019-30113 Deepened well originally drilled by

Corporation

Gamma ray

Gamma ray Neutron > 9 Paradox Formation salt **Pinkerton Trail** and **Molas Formations** Gamma rav Neutror Gamma Ray Density/Neutron Porosity Leadville Limestone ----casing _____ **Ouray Formation** <u>}</u> **Elbert Formation** -McCracken 5 ____ Sandstone

Completed 1960 Perforated 7714 to 7726 feet Initial Potential 98 BOPD, 81 MCFGPD, 96 BWPD

Core 1:6137 to 6187 feet Core 2: 7615 to 7674 feet Core 3: 7674 to 7676 feet Core 4: 7676 to 7688 feet Core 5: 7688 to 7726 feet Core 6: 7726 to 7775 feet Core 7: 7775 to 7797 feet Core 8:8432 to 8485 feet

DST 1:4432 to 4445 feet Recovered 110 feet of saltwater

DST 2:4882 to 4950 feet Recovered 5 feet of oil and 90 feet of slightly oil and gas cut saltwater

DST 3:5601 to 5701 feet Recovered 70 feet of oil and 20 feet of oil and gas cut mud

DST 4:6301 to 6373 feet Recovered 35 feet of mud

DST 5:6119 to 6373 feet Gas to surface on 30 minutes, mud to surface in 40 minutes, oil and gas cut mud to surface in 50 minutes, oil and gas cut muddy saltwater to surface in 120 minutes, and saltwater to surface in 180 minutes

DST 6: 5470 to 5770 feet - misrun DST 7: 5350 to 5800 feet - misrun

DST 8:6470 to 6606 feet Recovered 86 feet of mud DST 9: 7404 to 7424 feet Recovered 5 feet of very slightly

gas cut mud DST 10:7547 to 7610 feet - misrun

DST 11:7547 to 7615 feet Recovered 130 feet of slightly oil cut, highly gas cut, mud

DST 12:7615 to 7688 feet Recovered 160 feet of highly gas cut mud

DST 13:7674 to 7726 feet Recovered 600 feet of oil

DST 14:7733 to 7774 feet Recovered 5500 feet of gas cut saltwater

DST 15:8511 to 8600 feet Recovered 30 feet of mud

Plugged and Abandoned 1976

Perforated 7248 to 7276 feet

Recovered 17 BO and 13 BW Perforated 5960 to 5973 feet

Perforated 5798 to 5816 feet

Perforated 4108 to 4120 feet Recovered 17 BO and 13 BW DST 1:4050 to 4138 feet

Recovered 270 feet of gas cut mud, water, and oil

DST 2:7231 to 7281 feet Recovered 45 feet of gas cut mud

Completed 1962 Perforated 7050 to 7075 feet Initial Potential 660 BO/D Core 1: 4524 to 4534 feet Core 2: 4534 to 4585 feet Core 3: Perforated 7078 to 7088 feet 7680 to 7707 feet Core 4: 7707 to 7766 feet Core 5: 7760 to Perforated 6878 to 6889 feet 7820 feet Core 6: 7820 to 7850 feet

> DST 1:7606 to 7678 feet Gas to surface in 8 minutes at 5000 MCFGPD Recovered 40 feet of slightly oil cut brackish water

Gas analysis from DST 1: 4.7% methane 1.9% higher fr actions 90.6% hydrogen 0.7% CO2 Heat value 102 BTU

DST 2:7706 to 7766 feet Recovered 112 feet of brackish water cut mud

DST 3: 7920 to 7946 feet Recovered 4680 feet of water Union Texas Petroleum Corporation well Plugged and Abandoned 1973 DST 1:7935 to 8113 feet

Recovered 3 feet of mud

Plugged and Abandoned after deepening in 1975

Recovered 12 barrels of mud and 30 barrels of water

Perforated 9474 to 9490 feet Acidized and swab tested 3 to 0 MCFGPD

Perforated 9576 to 9584 feet Acidized and swab tested 30 to 2 MCFGPD

Perforated 9621 to 9631, 9665 to 9668 feet Acidized and swab tested Gas to surface to small to measure

Perforated 9724 to 9750 Acidized and swab tested 500 to 0 MCFGPD

Perforated 9852 to 99856, 9838 to 9843, 9822 to 9829 and, 9792 to 9797 feet Acidized and swab tested 2000 to 33 MCFGPD

Perforated 9924 to 9931, 9910 to 9917 feet Acidized and swab tested no show of oil or gas

Perforated 10,092 to 10,104, 10,070 to 10,078 Acidized and swab tested no show of oil or gas

Perforated 10,114 to 10,124 Acidized and swab tested no show of oil or gas

Gas analysis field average Leadville Limestone

11.4% methane 16.6% higher fractions 66.4% nitrogen 3.5% CO2 heat value 616 BTU

Union Texas Petroleum

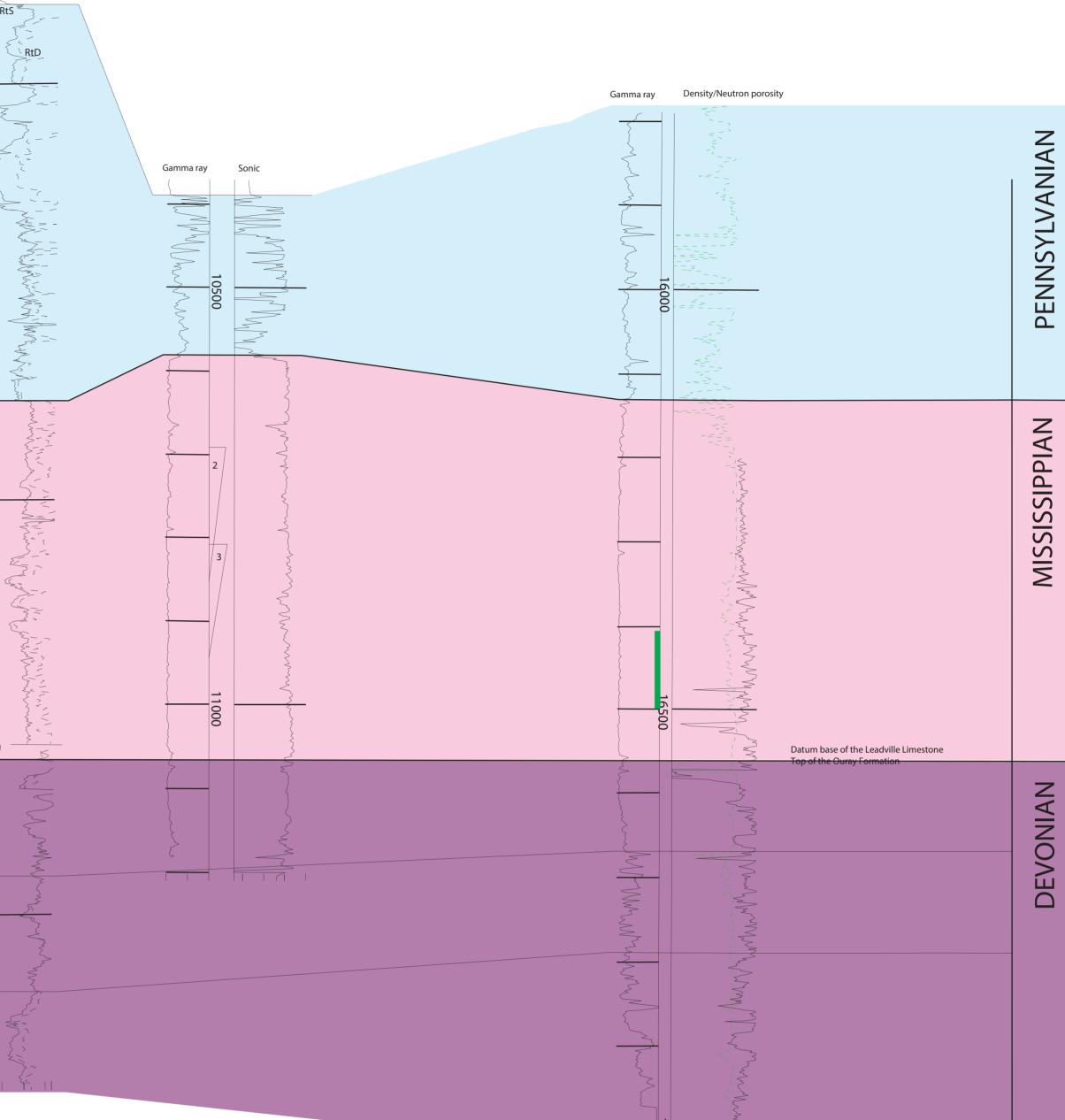
resistivitv shallow and

deep

Burkholder 1-G-1 SW1/4NE1/4 section 1, T. 26 S., R. 22 E., SLBL&M

KB 5300 feet API: 43-019-30076

Taylor Creek 2 NW1/4SE1/4 section 12, T. 26 S., R. 25 E., SLBL&M KB 8887 feet API: 43-019-31157



Cities Service Oil Company well

DST 2: 10,182 to 10,721 feet

Plugged and Abandoned 1972

DST 1:7724 to 7775 feet Recovered 30 feet of mud DST 2: 10690 to 10851 feet Recovered 30 feet of mud DST 3: 10807 to 10944 feet Recovered 3240 feet of mud cut saltwater Gas to surface in 105 minutes to

small to measure

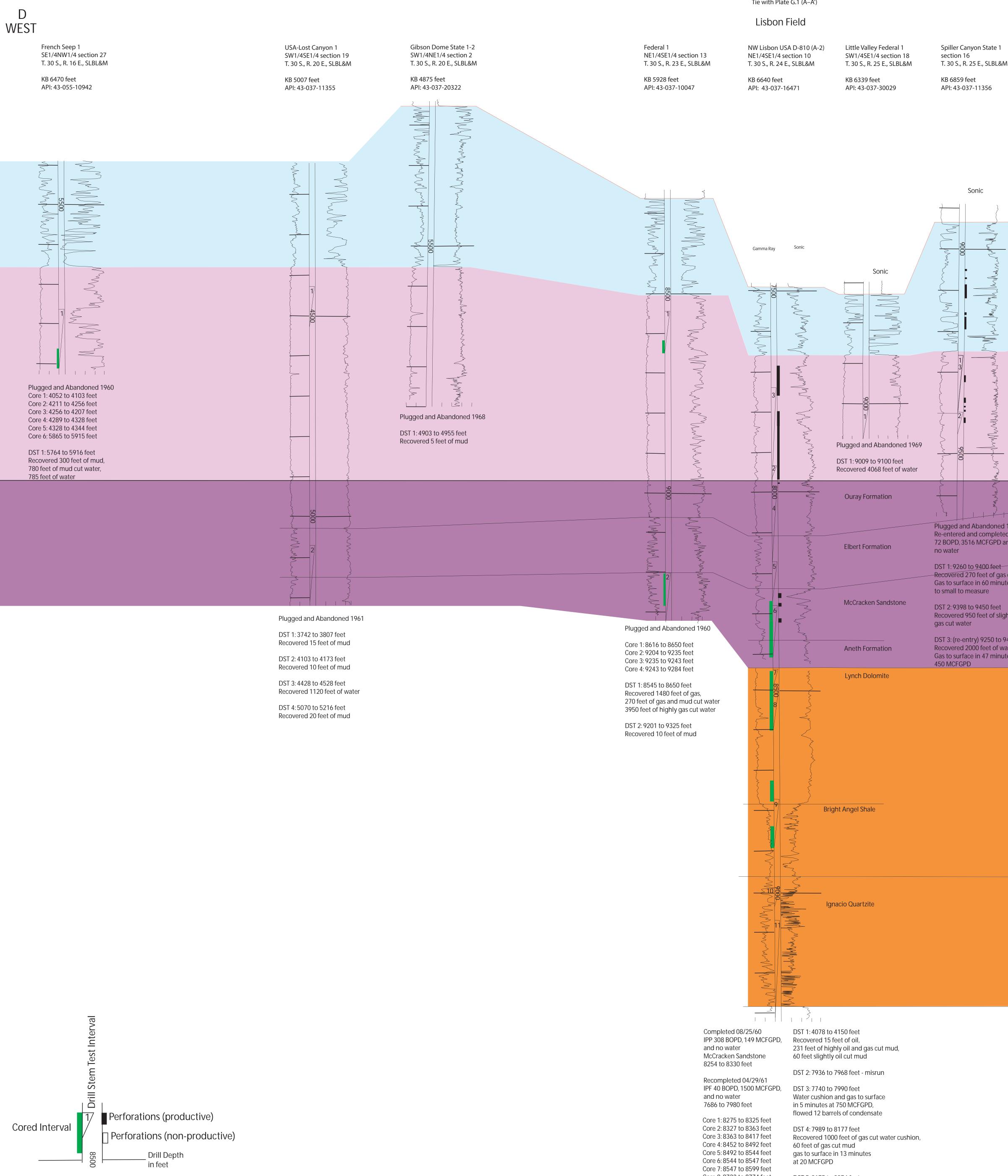
Perforated 15,495 to 15,520 feet no results reported

Plugged and Abandoned 1985

Perforated 15,390 to 15,420 feet no results reported

Core 1: 16,405 to 16,423 feet Core 2: 16,423 to 16,451 feet Core 3: 16,451 to 16,499 feet





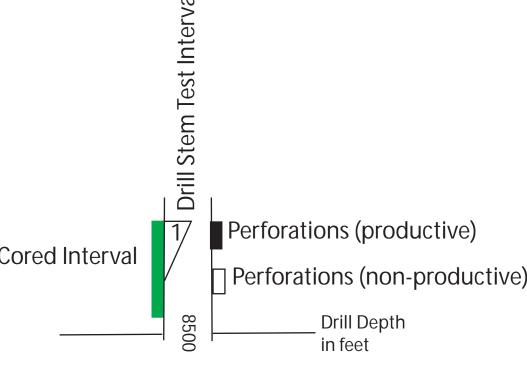




PLATE G.4 STRATIGRAPHIC CROSS SECTION D-D'

Spiller Canyon State 1 section 16 T. 30 S., R. 25 E., SLBL&M KB 6859 feet API: 43-037-11356

DST 5:8175 to 8274 feet gas to surface in 7 minutes at 15 MCFGPD

DST 6:8284 to 8417 feet Recovered 7500 feet of oil, 75 feet of oil and gas cut mud gas to surface in 12 minutes at 10 MCFGPD

DST 7:8446 to 8492 feet Recovered 190 feet of mud, 20 feet of salty mud

DST 8:8499 to 8598 feet Recovered 45 feet of mud

DST 9:8770 to 8891 feet Recovered 350 feet of mud DST 10:8989 to 9035 feet

Recovered 90 of mud

DST 11:9070 to 9310 feet Recovered 90 feet of salty mud, 800 of saltwater

Core 8: 8723 to 8774 feet Core 9:8838 to 8891 feet Core 10: 9390 to 9310 feet

Gas analysis field averages:

Leadville 48% methane 13% higher fractions

24% nitrogen 14% CO2 Heat value 685 BTU McCracken

61.3% methane 28.9% higher fractions 7.3% Nitrogen 2.1% CO2 heat value 1328 BTU

Recovered 7500 feet of oil,

Island Mesa 1 NW1/4SW1/4 section 22 T. 30 S., R. 26 E., SLBL&M KB 6464 feet API: 43-037-11353

Sonic PENNSYLVANIAN MISSISSIPPIAN Datum Base of Leadville Limestone Top of Ouray Formation Plugged and Abandoned 1962 Re-entered and completed 1978 DEVONIAN 72 BOPD, 3516 MCFGPD and Recovered 270 feet of gas cut mud Gas to surface in 60 minutes Recovered 950 feet of slightly Plugged and Abandoned 1960 DST 3: (re-entry) 9250 to 9404 feet Recovered 2000 feet of water DST 1: 10,702 to 10,854 feet misrun Gas to surface in 47 minutes DST 2: 10,722 to 10,854 feet Recovered 600 feet of mud, 6824 feet of water CAMBRIAN

PRECAMBRIAN

D' EAST