

Results of Directional Survey

API number:	30-025-39001		
OGRID:		Operator:	COG OPERATING LLC
		Property:	MC FEDERAL # 33

surface	ULSTR:	O	21	T 17S	R 32E
			1160	FSL	1430 FEL

BH Loc	ULSTR:	J	21	T 17S	R 32E
			1664	FSL	1662 FEL

Top Perf/OH	ULSTR:	J	21	T 17S	R 32E
		5492	1581	FSL	1621 FEL

Bot Perf/OH	ULSTR:	J	21	T 17S	R 32E
		6810	1648	FSL	1656 FEL

	MD	N/S	E/W	VD
	5435	417.56	-189.02	5399.45
TOP PERFS/OH	5492	420.67	-190.58	5456.34
	5498	421.00	-190.74	5462.33
	6733	484.56	-223.99	6695.22
BOT PERFS/OH	6810	488.35	-225.59	6772.11
	6828	489.24	-225.96	6790.08

NEXT TO LAST	7018	497.99	-229.79	6979.84
LAST READING	7091	501.43	-231.30	7052.74
TD	7138	503.64	-232.27	7099.68

Surface Location	1160	FS	1430	FE
Projected BHL	1664	FS	1662	FE
Location of				
Top Perfs/OH	1581	FS	1621	FE
Bottom Perfs/OH	1648	FS	1656	FE

SUMMARY of Subsurface Locations

Surface Location	O-21-17S-32E	1160	FS	1430	FE	Vert. Depth
Top Perfs/OH	J-21-17S-32E	1581	FS	1621	FE	5456.34
Bottom Perfs/OH	J-21-17S-32E	1648	FS	1656	FE	6772.11
Projected TD	J-21-17S-32E	1664	FS	1662	FE	7099.68