

HYDRAULICS CALCULATIONS

PLASTIC VISCOSITY 8.00 cP  
 YIELD POINT 22.00 lb/cft<sup>2</sup>  
 POWER LAW k 3.6614  
 POWER LAW n .3410  
 DEPTH 4324.9 ft (1318.2 m)  
 VERTICAL DEPTH 4324.8 ft  
 DEPTH OF RETURNS 4296.8 ft  
 CUTTINGS BULK DENSITY 2.30 spc grv  
 MUD DENSITY 9.00 lb/gal  
 ACTIVE SURFACE MUD VOLUME 528 bbl  
 FLOW RATE 732 gal/min  
 BOOSTER FLOW 0 gal/min  
 PUMP PRESSURE 2750 psi  
 PUMP gal/stk 4.96 gal/stk  
 BIT NOZZLES 11, 13, 13, 13

CALCULATED RESULTS:

FROM ft	TO ft	LENGTH ft	ANNULUS/PIPE in	ANN VELO. ft/min	CRIT VELO ft/min	FLOW REGIME	PRESS LOSS psi
0.0	343.0	343.0	18.750/ 5.000	54.9	330.3	LAMINAR	.8
343.0	1356.0	1013.0	18.730/ 5.000	55.1	330.4	LAMINAR	2.3
1356.0	3435.9	2079.9	12.250/ 5.000	143.5	379.4	LAMINAR	15.6
3435.0	3951.9	516.0	12.250/ 5.000	143.5	379.4	LAMINAR	3.9
3951.0	4232.9	281.0	12.250/ 8.000	208.5	425.7	LAMINAR	4.9
4232.0	4324.9	92.0	12.250/ 9.500	300.0	466.0	LAMINAR	3.2

Annulus Diam	Pipe		
	j.d.	o.d.	i.d.
18.750	6.370	5.000	4.276
18.730	6.370	5.000	4.276
12.250	6.370	5.000	4.276
12.250	6.375	5.000	3.000
12.250	8.000	8.000	2.875
12.250	9.500	9.500	3.000

MUD HYDROSTATIC 8.94 lb/gal  
 FLOW CONTRIBUTION .14 lb/gal  
 CUTTINGS CONTRIBUTION .12 lb/gal  
 EQUIVALENT CIRCULATING DENSITY 9.20 lb/gal

SURFACE PRESSURE LOSS 57 psi NOZZLE VELOCITY 487.6 ft/sec  
 PIPEBORE PRESSURE LOSS 541 psi HYDRAULIC POWER 815.8 hp  
 ANNULAR PRESSURE LOSS 31 psi JET IMPACT FORCE 1662.6 lbs  
 BIT PRESSURE LOSS 1910 psi % OF PRESS LOSS AT BIT 75  
 TOTAL CALC. PRESS LOSS 2539 psi

VOLUMES:	gal	bbl	Strokes	Minutes @ 148 s.p.m.
1) Pipe Capacity	2881	69	581	3.9
2) Pipe Displacement	2346	56	473	3.2
3) Total Annulus	32273	768	6507	44.1 ← LAG
4) Mud in active pits	22168	528	4469	30.3
Circulation (1) + (3)	35154	837	7088	48.0
Hole Volume (1)+(2)+(3)	37500	893	7560	51.2
Total Mud Circulation	57322	1365	11557	78.3
HOLE OUT OF GAUGE:				
CIRCULATION CORRECTION FACTOR =	1.0465			
Corrected Annulus	33907	807	6836	46.3 ← LAG
Corrected Hole	39133	932	7890	53.5

