

HYDRAULICS CALCULATIONS

PLASTIC VISCOSITY 24.00 cP  
 YIELD POINT 14.00 lb/cft<sup>2</sup>  
 POWER LAW k .4963  
 POWER LAW n .7063  
 DEPTH 2783.60 m (9149')  
 VERTICAL DEPTH 2783.47 m  
 DEPTH OF RETURNS 2783.50 m  
 CUTTINGS BULK DENSITY 2.10 spc grv  
 MUD DENSITY 9.34 lb/gal  
 ACTIVE SURFACE MUD VOLUME 298 bbl  
 FLOW RATE 250 gal/min  
 BOOSTER FLOW 0 gal/min  
 PUMP PRESSURE 500 psi  
 PUMP gal/stk 4.96 gal/stk  
 BIT NOZZLES 19, 19, 19

CALCULATED RESULTS:

FROM m	TO m	LENGTH m	ANNULUS/PIPE in	ANN VELO. ft/min	CRIT VELO ft/min	FLOW REGIME	PRESS LOSS psi
0.00	104.55	104.55	18.750/ 5.000	13.8	172.9	LAMINAR	.1
104.55	1651.4	1546.9	12.347/ 5.000	48.1	246.0	LAMINAR	3.7
1651.4	2474.9	823.47	12.250/ 5.000	49.0	247.9	LAMINAR	4.8
2474.7	2642.3	167.39	12.250/ 5.000	49.0	247.9	LAMINAR	1.0
2642.0	2783.6	146.35	12.250/ 8.000	71.2	334.2	LAMINAR	2.7

Annulus Diam	Pipe		
	j.d.	o.d.	i.d.
18.750	6.375	5.000	4.276
12.347	6.375	5.000	4.276
12.250	6.375	5.000	4.276
12.250	6.375	5.000	3.000
12.250	8.000	8.000	2.875

MUD HYDROSTATIC 9.34 lb/gal  
 FLOW CONTRIBUTION .04 lb/gal  
 CUTTINGS CONTRIBUTION .00 lb/gal  
 EQUIVALENT CIRCULATING DENSITY 9.38 lb/gal

SURFACE PRESSURE LOSS 8 psi NOZZLE VELOCITY 96.6 ft/sec  
 PIPEBORE PRESSURE LOSS 299 psi HYDRAULIC POWER 11.3 hp  
 ANNULAR PRESSURE LOSS 17 psi JET IMPACT FORCE 116.7 lbs  
 BIT PRESSURE LOSS 78 psi % OF PRESS LOSS AT BIT 19  
 TOTAL CALC. PRESS LOSS 403 psi

VOLUMES:	gal	bbl	Strokes	Minutes @ 50 s.p.m.
1) Pipe Capacity	6420	153	1294	25.7
2) Pipe Displacement	3947	94	796	15.8
3) Total Annulus	48671	1159	9813	194.7 ← LAG
4) Mud in active pits	12495	293	2519	50.0
Circulation (1) + (3)	55091	1312	11107	220.4
Hole Volume (1)+(2)+(3)	59038	1406	11903	236.2
Total Mud Circulation	67586	1609	13626	270.3
HOLE OUT OF GAUGE:				
CIRCULATION CORRECTION FACTOR =	1.0564			
Corrected Annulus	51778	1233	10439	207.1 ← LAG
Corrected Hole	62145	1480	12529	249.6

