

### HYDRAULICS CALCULATIONS

PLASTIC VISCOSITY	16.00 cP
YIELD POINT	12.00 lb/cft <sup>2</sup>
POWER LAW k	.5337
POWER LAW n	.6521
DEPTH	6410.5 ft (1953.8m)
VERTICAL DEPTH	6410.2 ft
DEPTH OF RETURNS	6356.2 ft
CUTTINGS BULK DENSITY	2.50 spc grv
MUD DENSITY	9.04 lb/gal
ACTIVE SURFACE MUD VOLUME	371 bbl
FLOW RATE	614 gal/min
BOOSTER FLOW	0 gal/min
PUMP PRESSURE	2210 psi
PUMP gal/stk	4.96 gal/stk
BIT NOZZLES	15, 15, 15

### 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	46.1	163.1	LAMINAR	.2
343.0	5331.2	5038.2	12.347/ 5.000	113.0	223.1	LAMINAR	14.0
5331.0	5413.0	36.8	12.347/ 5.000	113.0	223.1	LAMINAR	.1
5413.0	5930.3	512.3	12.250/ 5.000	120.3	224.6	LAMINAR	1.5
5930.0	6410.5	480.2	12.250/ 8.000	174.8	292.3	LAMINAR	4.2

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
12.347	6.375	5.000	3.333
12.250	6.375	5.000	3.333
12.250	8.000	8.000	2.875

MUD HYDROSTATIC	8.96 lb/gal
FLOW CONTRIBUTION	.06 lb/gal
CUTTINGS CONTRIBUTION	.13 lb/gal
EQUIVALENT CIRCULATING DENSITY	9.20 lb/gal

SURFACE PRESSURE LOSS	43 psi	NOZZLE VELOCITY	330.4 ft/sec
PIPEBORE PRESSURE LOSS	893 psi	HYDRAULIC POWER	418.3 hp
ANNULAR PRESSURE LOSS	20 psi	JET IMPACT FORCE	1092.5 lbs
BIT PRESSURE LOSS	1163 psi	% OF PRESS LOSS AT BIT	55
TOTAL CALC. PRESS LOSS	2124 psi		

VOLUMES:	gal	bbl	Strokes	Minutes @ 124 s.p.m.
1) Pipe Capacity	4378	104	983	7.1
2) Pipe Displacement	3110	74	627	5.1
3) Total Annulus	34784	828	7013	56.7 ← LAG
4) Mud in active pits	15595	371	3144	25.4
Circulation (1) + (3)	39162	932	7896	63.8
Hole Volume (1)+(2)+(3)	42273	1006	8523	68.9
Total Mud Circulation	54757	1304	11040	89.2
HOLE OUT OF GAUGE:				
CIRCULATION CORRECTION FACTOR =	1.0214			
Corrected Annulus	35622	848	7182	58.0 ← LAG
Corrected Hole	43110	1026	8691	70.2

