DEPT. NAT. RES & ENV
PE906907

82/986

APPENDIX 6·9 SECTION 2

SHELL DEVELOPMENT (AUSTRALIA)

HAMMERHEAD 1

GEOSERVICES OVERSEAS S.A.

FINAL WELL REPORT (SECTION II)

CONTENTS

- Real Time Plots
- Bit Performance Plots
- Bit Cost Plots
- Real Time Print-Out
  (including Bit Reports and
  Daily Hydraulics Reports)

RECEIVED
19 AUG 1982
PEB
BMRG & G
CANBERRA
A.C.T.

REAL TIME DEPTH PLOTS

GEOSERVICES
ON-LINE TDC

REAL TIME DEPTH PLOT

16/ 4/ 82

HAMMERHEAD #1

SCALE 1/ 1000

TORQUE	WOB	RPM	FLOW RATE	MUD WEIGHT IN OUT	DEPTH	PENETRATION RATE	DCS TREND	PF/ECD/FRAC	TOTAL GAS
N*m	tons	rpm	l/min	sg	met	m/hr		sg	units
1000. 2000. 3000. 4000. 5000.	5.00 10.0 15.0 20.0 25.0	40.0 80.0 120.0 160.0 200.0	1000. 2000. 3000. 4000. 5000.	1.00 1.10 1.20 1.30 1.40	100 120 140 160 180 200 220 240 260 280 300	1.00 10.0 100.0 400.0	1.00 3.00	1.82 1.84 1.86 2.28 2.80	1.00 10.0 100.0

Geoservices
ERO

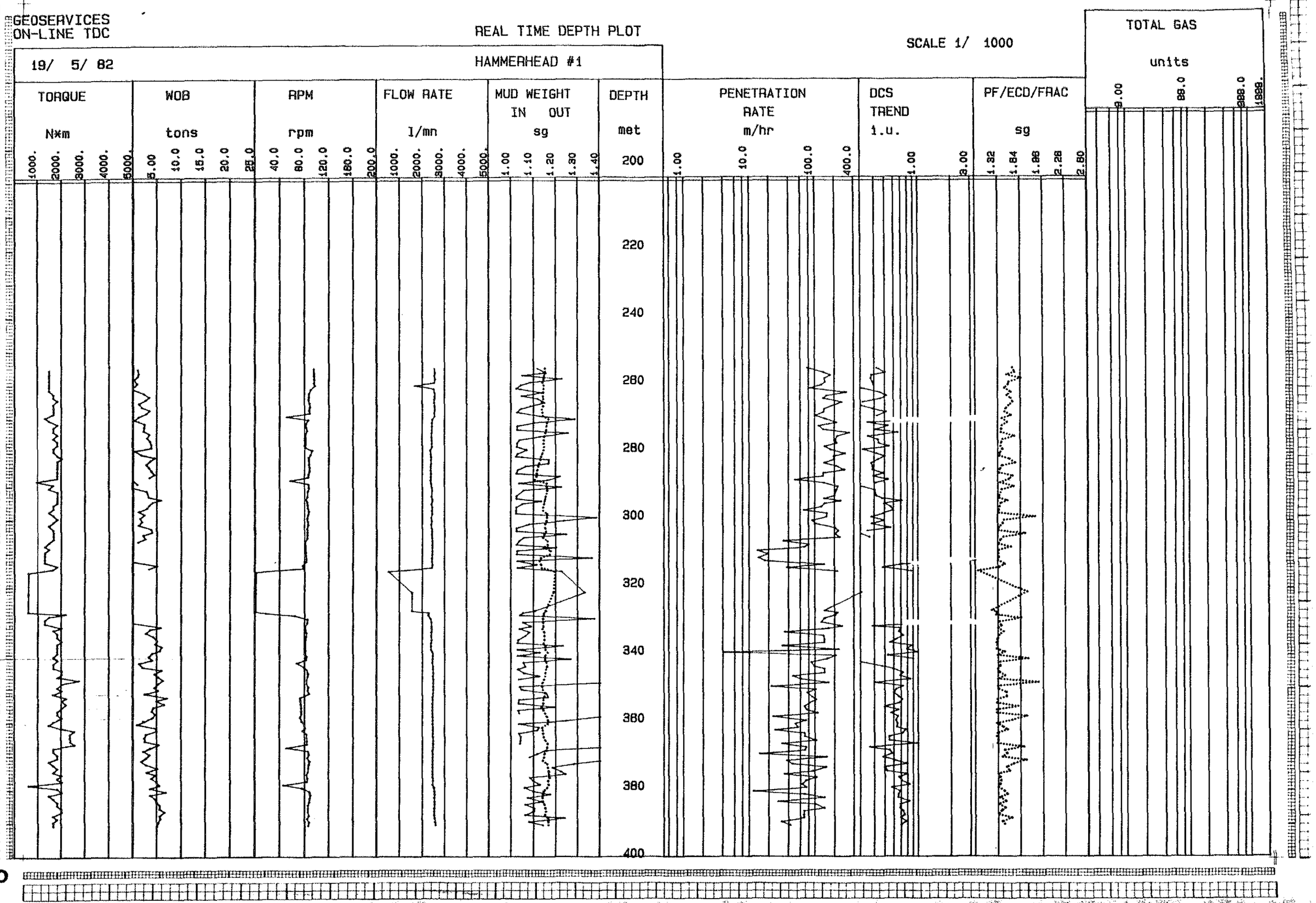
GEOSERVICES
ON-LINE TDC

REAL TIME DEPTH PLOT

19/ 5/ 82

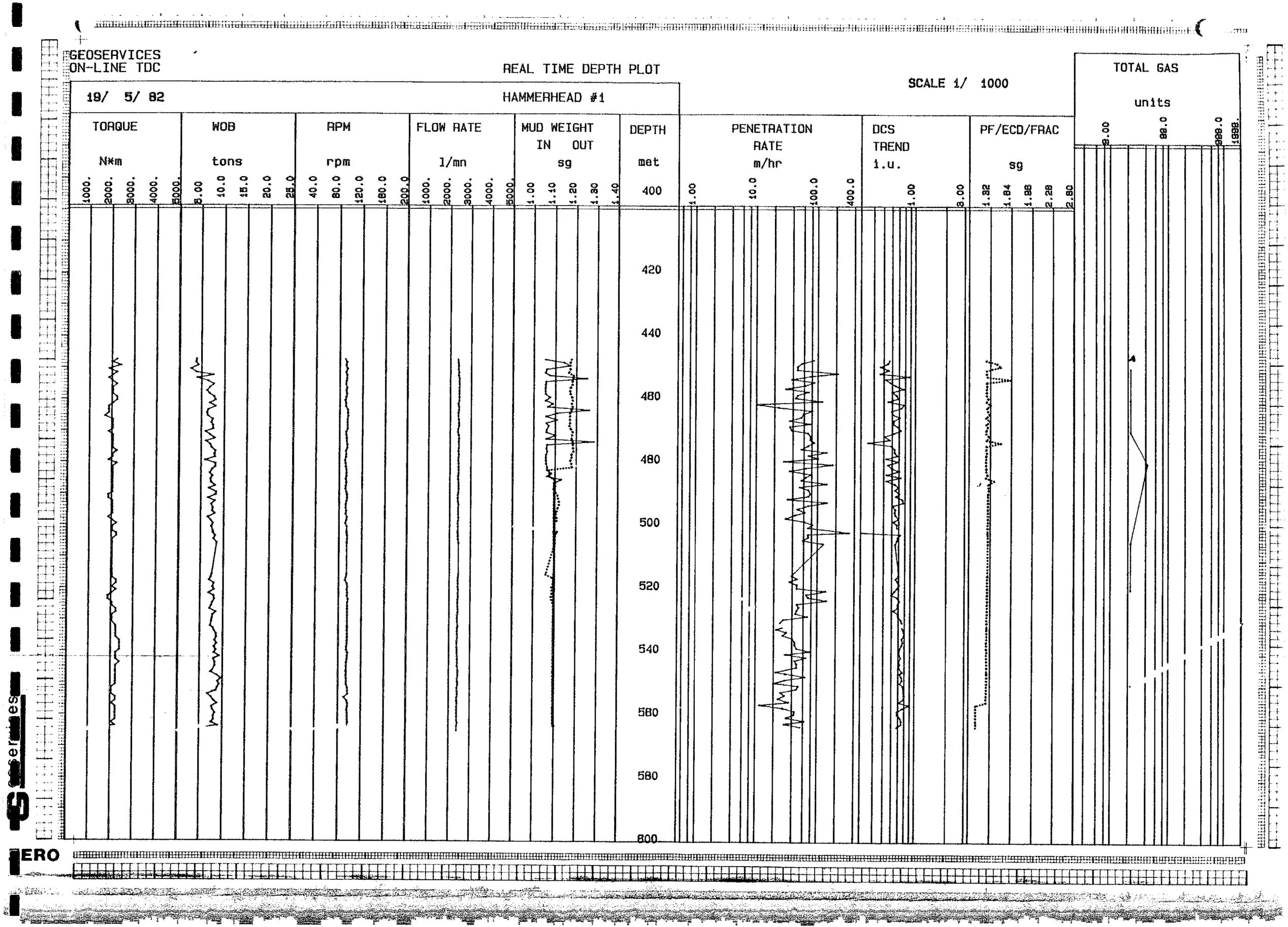
HAMMERHEAD #1

SCALE 1/ 1000



Geoservices

ERO


GEOSERVICES
ON-LINE TDC
REAL TIME DEPTH PLOT
SCALE 1/ 1000
19/ 5/ 82
HAMMERHEAD #1
TORQUE
N*m
1000. 2000. 3000. 4000. 5000.
WOB
tons
5.00 10.0 15.0 20.0 25.0
RPM
rpm
40.0 80.0 120.0 160.0 200.0
FLOW RATE
l/mn
1000. 2000. 3000. 4000. 5000.
MUD WEIGHT
IN OUT
sg
1.00 1.10 1.20 1.30 1.40
DEPTH
met
400
420
440
460
480
500
520
540
560
580
600
PENETRATION
RATE
m/hr
1.00 10.0 100.0 400.0
DCS
TREND
i.u.
1.00 3.00
PF/ECD/FRAC
sg
1.32 1.64 1.96 2.28 2.60
TOTAL GAS
units
8.00 88.0 988.0 1998.
ERO

GEOSERVICES
ON-LINE TDC

REAL TIME DEPTH PLOT

29/ 5/ 82

HAMMERHEAD #1

SCALE 1/ 1000

TORQUE
N*m
1000. 2000. 3000. 4000. 5000.

WOB
tons
5.00 10.0 15.0 20.0 25.0

RPM
rpm
40.0 80.0 120.0 160.0 200.0

FLOW RATE
l/mn
1000. 2000. 3000. 4000. 5000.

MUD WEIGHT
IN OUT
sg
1.00 1.10 1.20 1.30 1.40

DEPTH
met
190 210 230 250 270 290 310 330 350 370 390

PENETRATION RATE
m/hr
1.00 10.0 100.0 400.0

DCS TREND
1.00 3.00

PF/ECD/FRAC
sg
1.32 1.84 1.98 2.28 2.80

TOTAL GAS
units
0.00 88.0 888.0 1888.

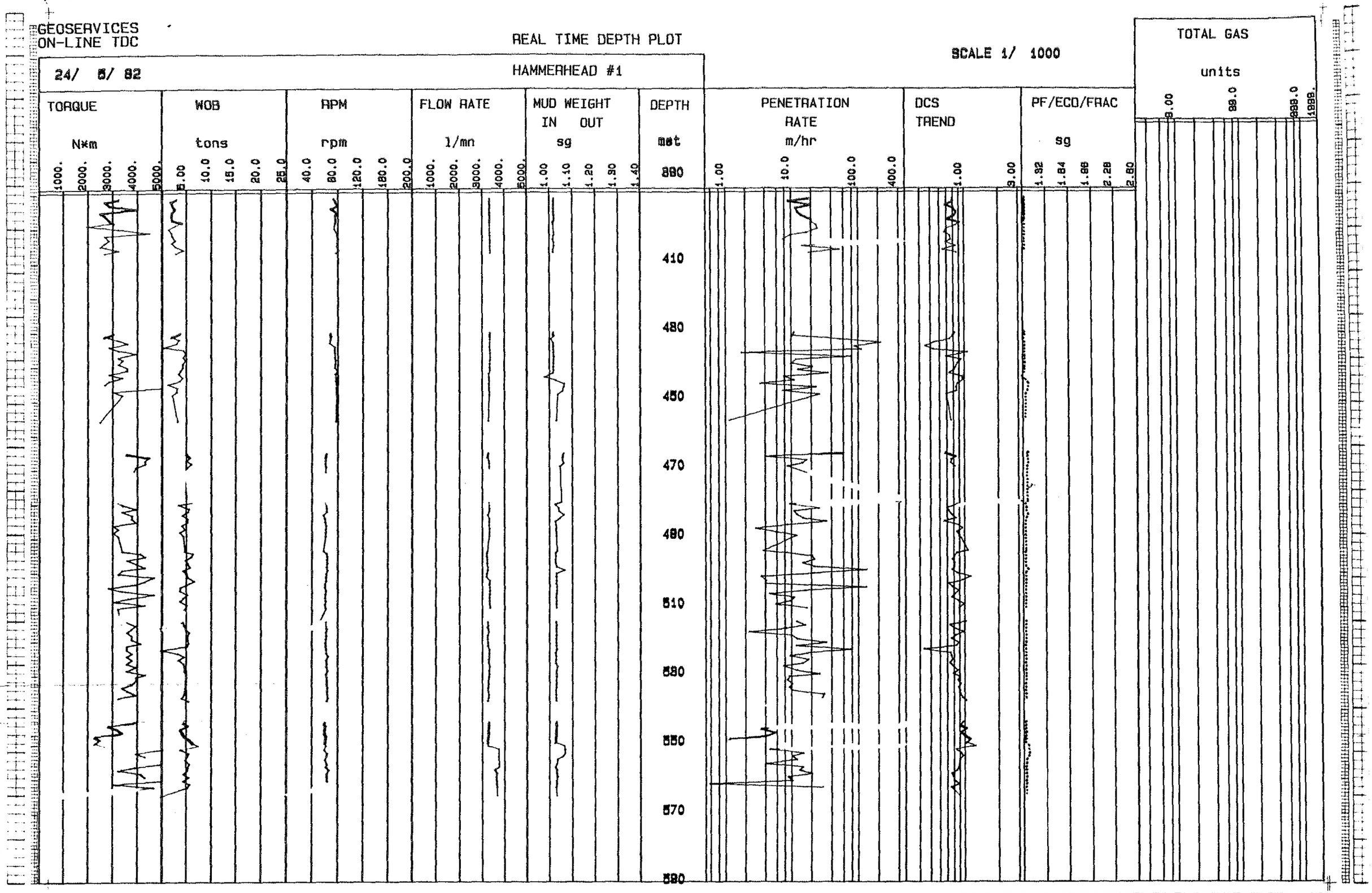
GEOSERVICES
ON-LINE TDC

REAL TIME DEPTH PLOT

24/ 5/ 82

HAMMERHEAD #1

SCALE 1/ 1000



GEOSERVICES
ON-LINE TDC

REAL TIME DEPTH PLOT

3/ 6/ 92

HAMMERHEAD #1

SCALE 1/ 1000

TORQUE N*m: 1000. 2000. 3000. 4000. 5000.

WOB tons: 5.00 10.0 15.0 20.0 25.0

RPM rpm: 40.0 80.0 120.0 180.0 200.0

FLOW RATE l/mn: 1000. 2000. 3000. 4000. 5000.

MUD WEIGHT IN OUT sg: 1.00 1.10 1.20 1.30 1.40

DEPTH met: 580 600 620 640 660 680 700 720 740 760 780

PENETRATION m/hr: 1.00 10.0 100.0 400.0

DCS TREND: 1.00 3.00

PF/ECD/FRAC sg: 1.32 1.64 1.88 2.28 2.80

TOTAL units: 1.00 10.0 100.0 1000. 2000.

geoservices

ERO

GEOSERVICES
ON-LINE TDC

3/ 8/ 82

REAL TIME DEPTH PLOT

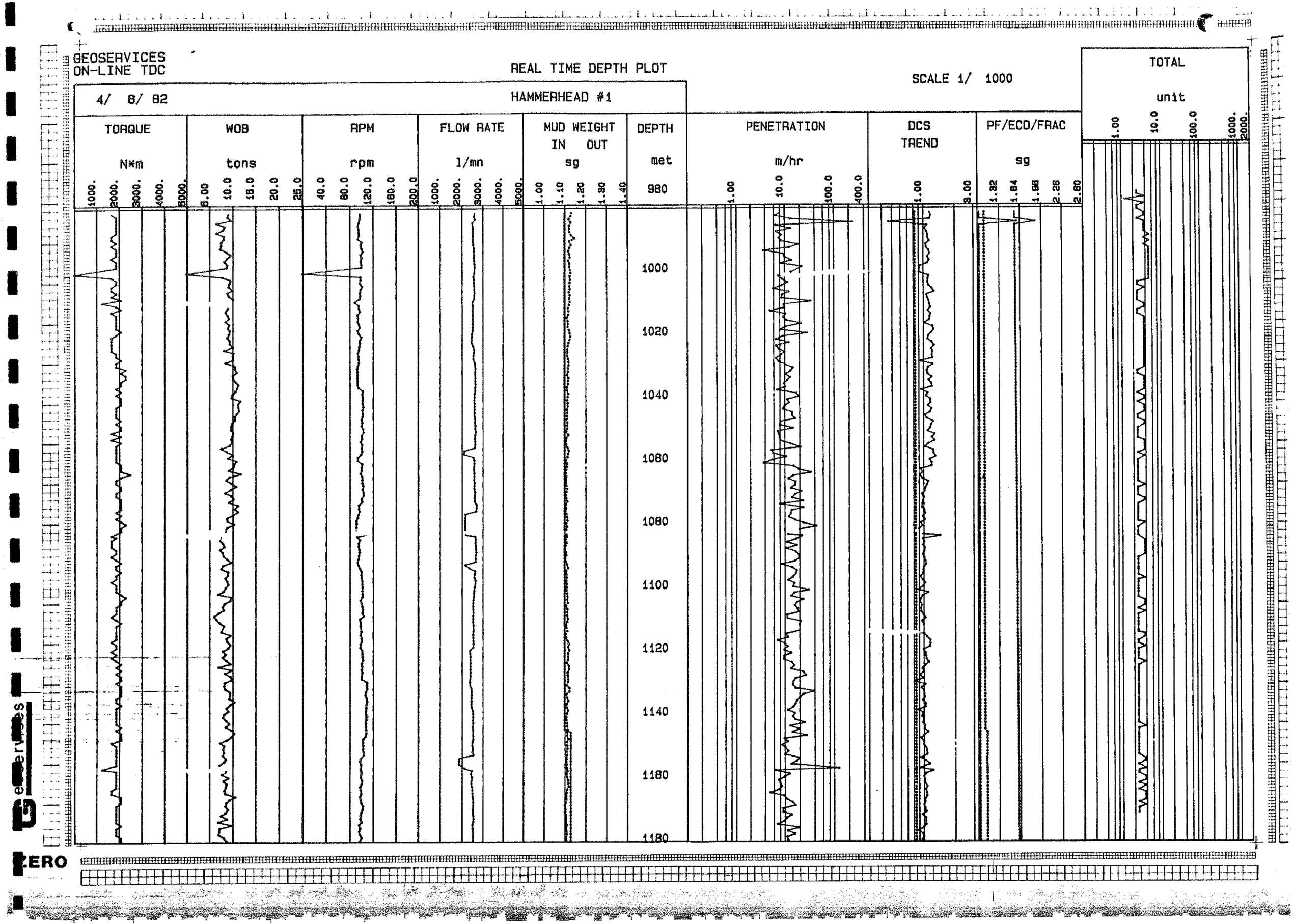
HAMMERHEAD #1

SCALE 1/ 1000

TORQUE	WOB	RPM	FLOW RATE	MUD WEIGHT IN OUT	DEPTH	PENETRATION	DCS TREND	PF/ECD/FRAC	TOTAL
N*m	tons	rpm	l/mn	sg	met	m/hr		sg	units
1000. 2000. 3000. 4000. 5000.	5.00 10.0 15.0 20.0 25.0	40.0 80.0 120.0 160.0 200.0	1000. 2000. 3000. 4000. 5000.	1.00 1.10 1.20 1.30 1.40	780 800 820 840 860 880 900 920 940 960 980	1.00 10.0 100.0 400.0	1.00 3.00	1.32 1.64 1.88 2.28 2.80	1.00 10.0 100.0 1000. 2000.

GEOSERVICES

ERO


GEOSERVICES
ON-LINE TDC
REAL TIME DEPTH PLOT
SCALE 1/ 1000
4/ 8/ 82
HAMMERHEAD #1
TORQUE
N*m
1000. 2000. 3000. 4000. 5000.
WOB
tons
5.00 10.0 15.0 20.0 25.0
RPM
rpm
40.0 80.0 120.0 160.0 200.0
FLOW RATE
l/mn
1000. 2000. 3000. 4000. 5000.
MUD WEIGHT
IN OUT
sg
1.00 1.10 1.20 1.30 1.40
DEPTH
met
980
1000
1020
1040
1060
1080
1100
1120
1140
1160
1180
PENETRATION
m/hr
1.00 10.0 100.0 400.0
DCS
TREND
1.00 3.00
PF/ECD/FRAC
sg
1.32 1.64 1.96 2.28 2.60
TOTAL
unit
1.00 10.0 100.0 1000. 2000.
ZERO

GEOSERVICES
ON-LINE TDC

REAL TIME DEPTH PLOT

5/ 8/ 82

HAMMERHEAD #1

SCALE 1/ 1000

TORQUE N*m	WOB tons	RPM rpm	FLOW RATE l/mn	MUD WEIGHT IN OUT sg	DEPTH met	PENETRATION m/hr	DCS TREND	PF/ECD/FRAC sg	TOTAL unit
1000. 2000. 3000. 4000. 5000.	5.00 10.0 15.0 20.0 25.0	40.0 80.0 120.0 180.0 200.0	1000. 2000. 3000. 4000. 5000.	1.00 1.10 1.20 1.30 1.40	1180	1.00 10.0 100.0 400.0	1.00 3.00	1.82 1.84 1.86 2.28 2.80	1.00 10.0 100.0 1000. 2000.
					1200				
					1220				
					1240				
					1260				
					1280				
					1300				
					1320				
					1340				
					1360				
					1380				

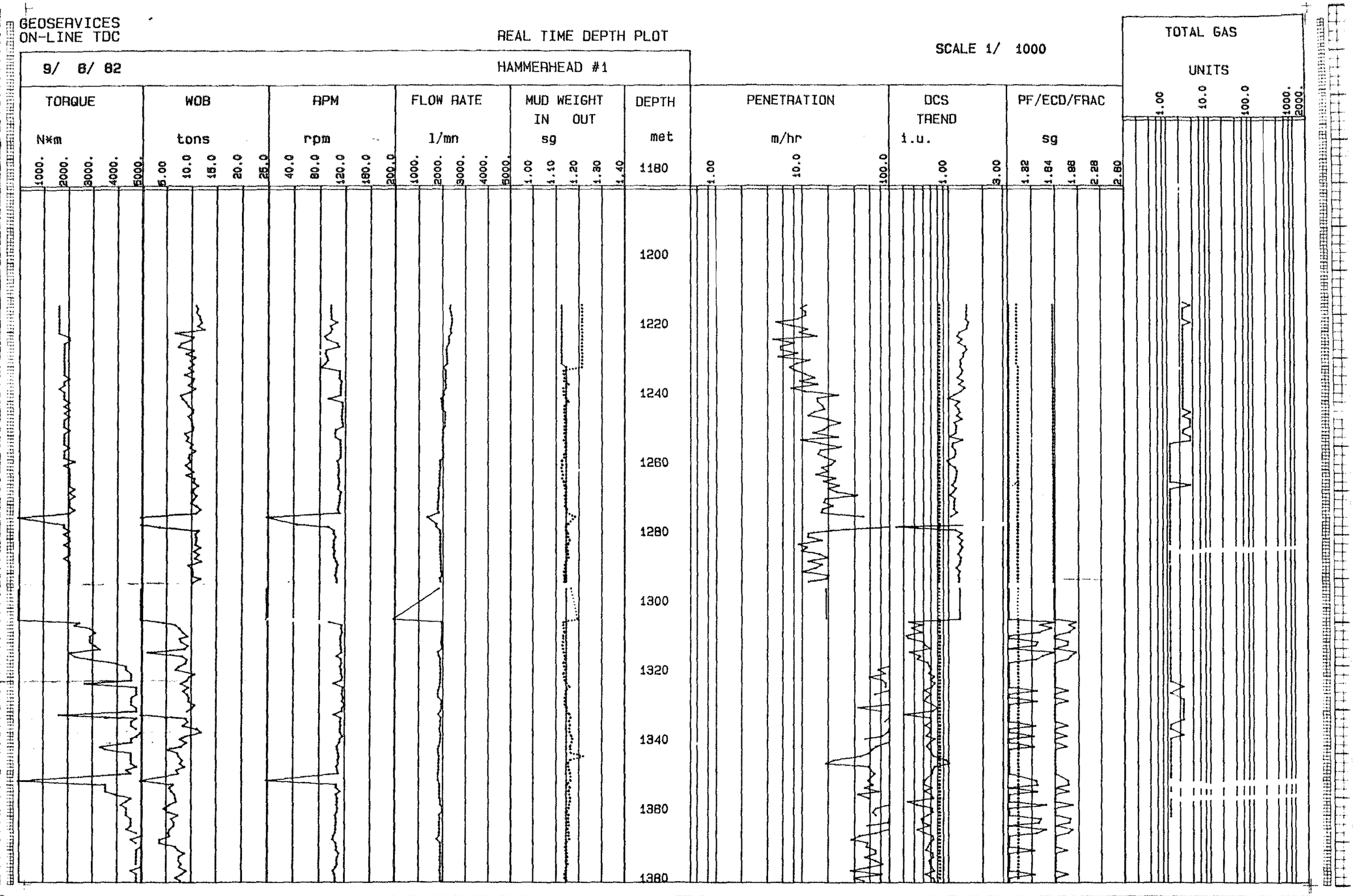
GEOSERVICES
ON-LINE TDC

REAL TIME DEPTH PLOT

9/ 6/ 82

HAMMERHEAD #1

SCALE 1/ 1000



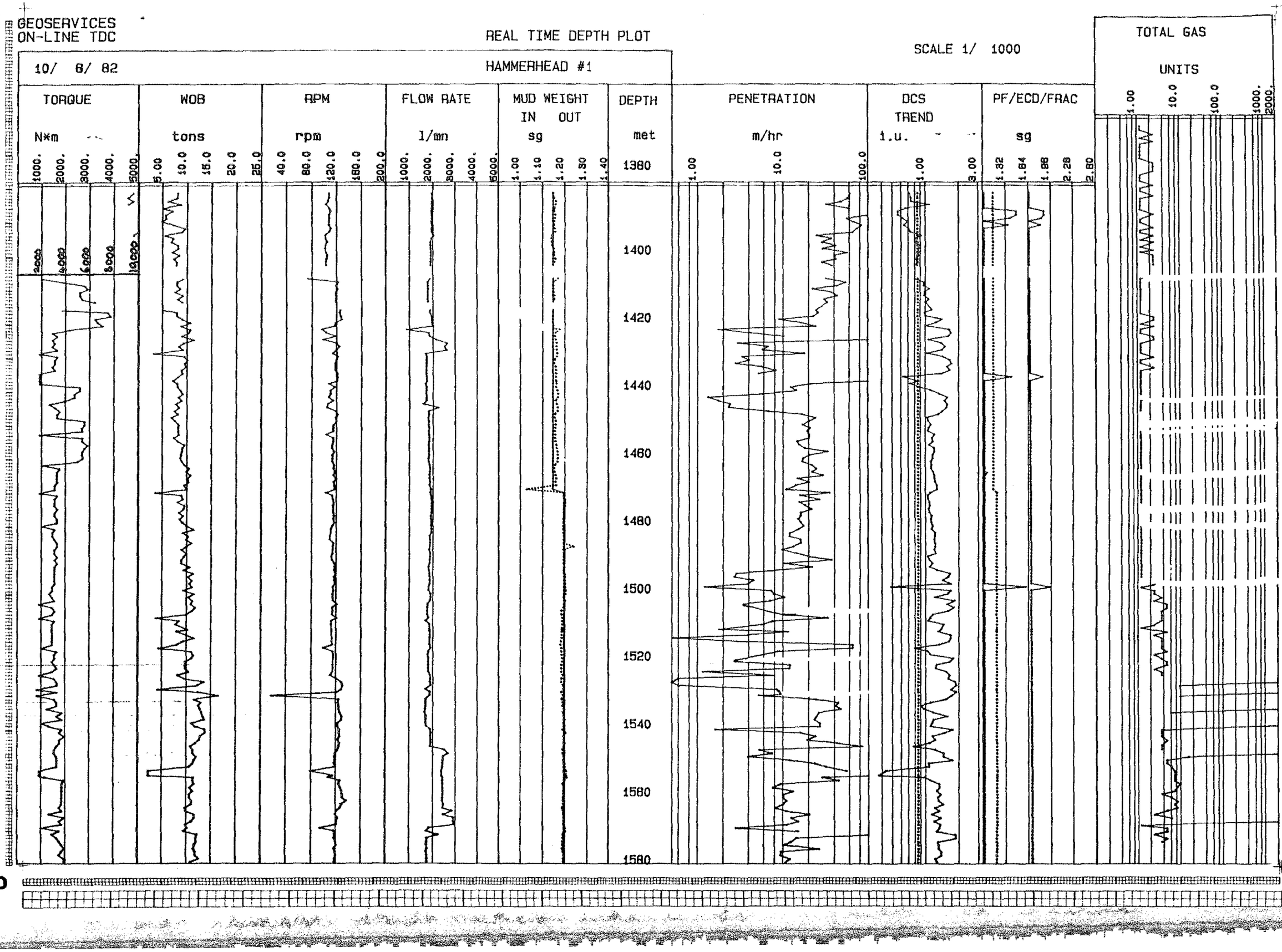
GEOSERVICES
ON-LINE TDC

REAL TIME DEPTH PLOT

10/ 8/ 82

HAMMERHEAD #1

SCALE 1/ 1000



Geoservices

ZERO

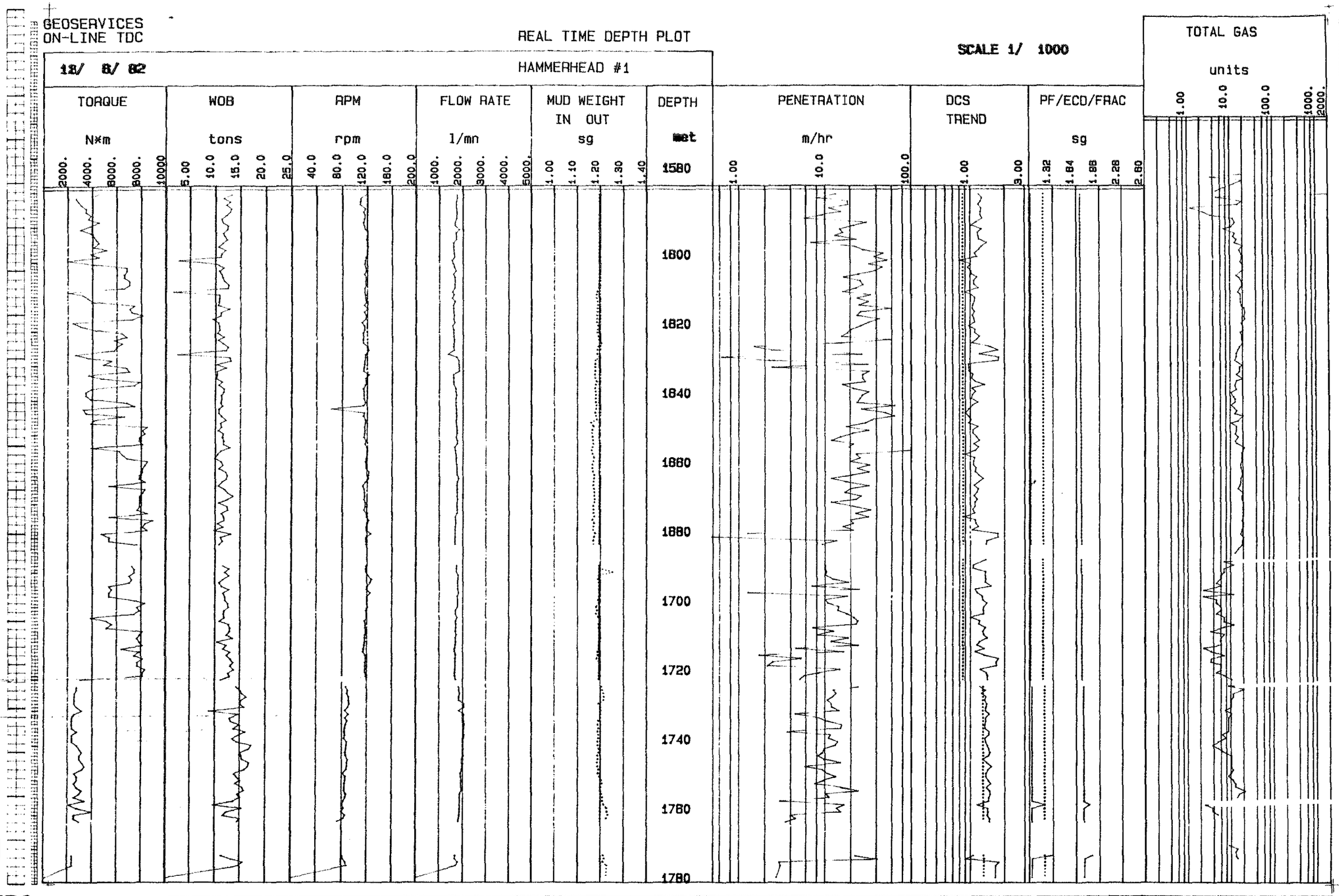
GEOSERVICES
ON-LINE TDC

REAL TIME DEPTH PLOT

12/ 8/ 82

HAMMERHEAD #1

SCALE 1/ 1000



ZERO

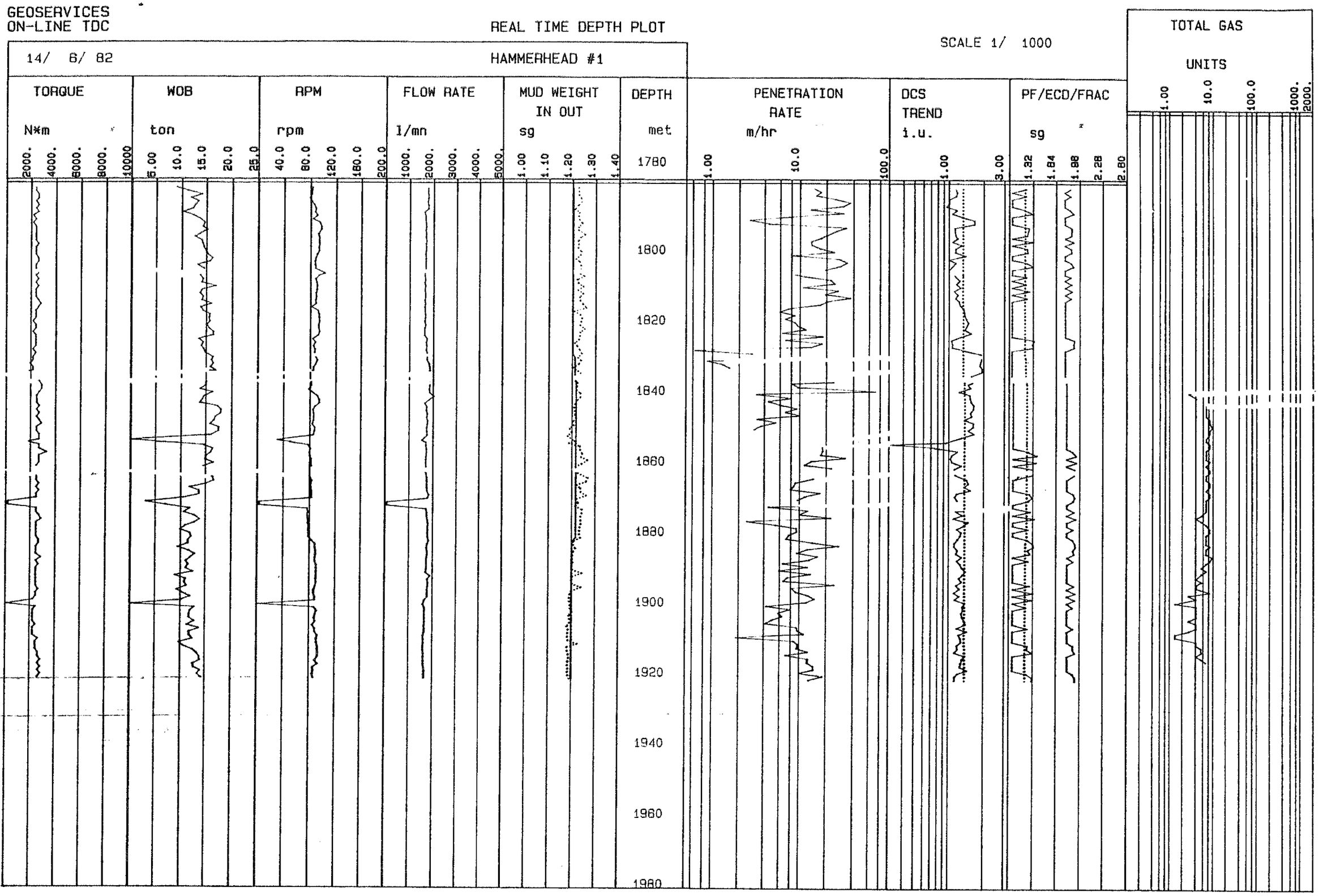
GEOSERVICES
ON-LINE TDC

REAL TIME DEPTH PLOT

14/ 6/ 82

HAMMERHEAD #1

SCALE 1/ 1000



GEOSERVICES
ON-LINE TDC

REAL TIME DEPTH PLOT

15/ 6/ 82

HAMMERHEAD #1

SCALE 1/ 1000

TORQUE
N*m
2000. 4000. 6000. 8000. 10000

WOB
ton
5.00 10.0 15.0 20.0 25.0

RPM
rpm
40.0 80.0 120.0 160.0 200.0

FLOW RATE
l/mn
1000. 2000. 3000. 4000. 5000.

MUD WEIGHT
IN OUT
sg
1.00 1.10 1.20 1.30 1.40

DEPTH
met
1920
1940
1960
1980
2000
2020
2040
2060
2080
2100
2120

PENETRATION
RATE
m/hr
1.00 10.0 100.0

DCS
TREND
i.u.
1.00 3.00

PF/ECD/FRAC
sg
1.32 1.84 1.88 2.28 2.80

TOTAL GAS
UNITS
1.00 10.0 100.0 1000. 2000.

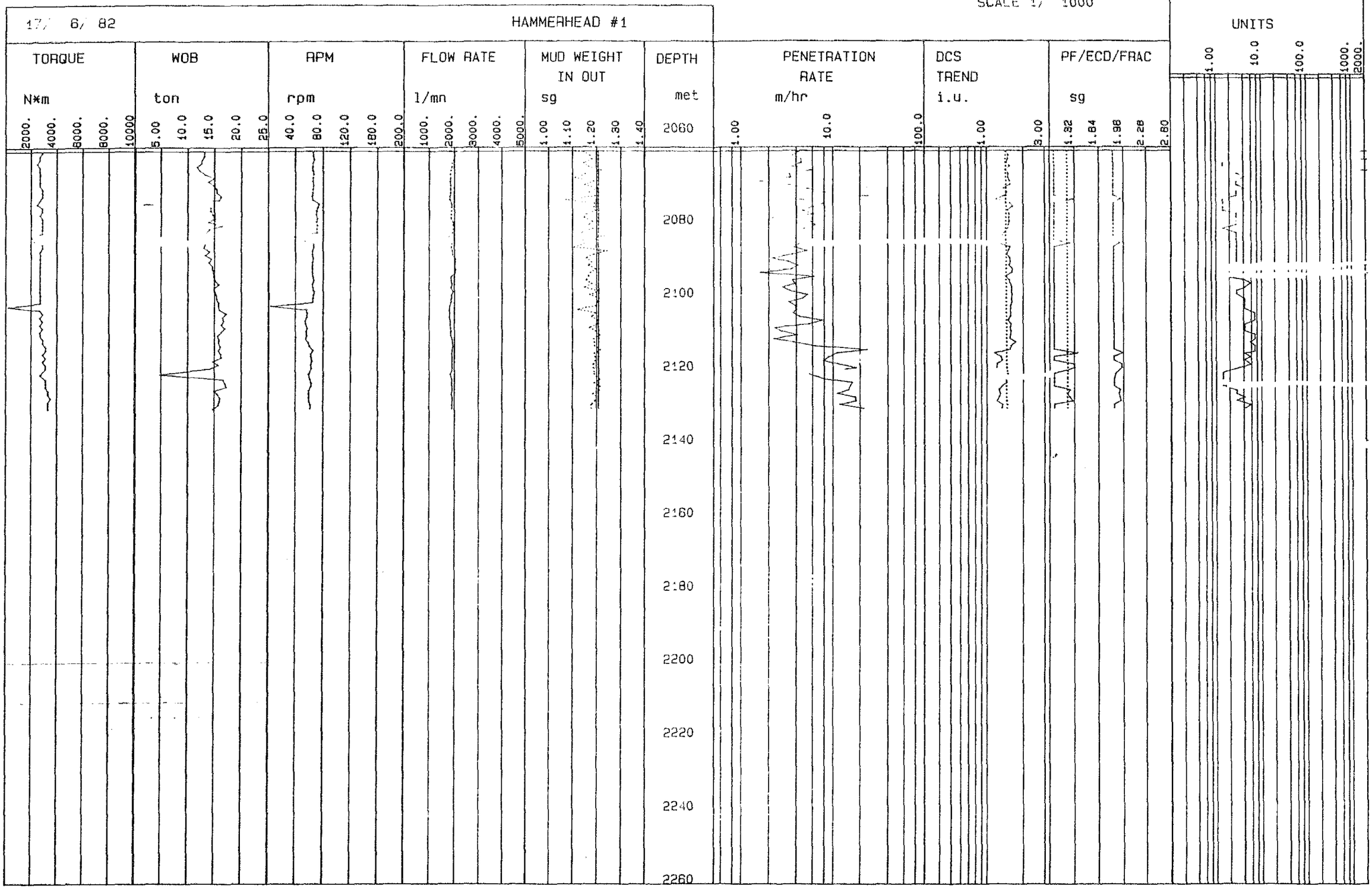
GEOSERVICES
ON-LINE TDC

REAL TIME DEPTH PLOT

17/ 6/ 82

HAMMERHEAD #1

SCALE 1/ 1000



BIT PERFORMANCE PLOTS

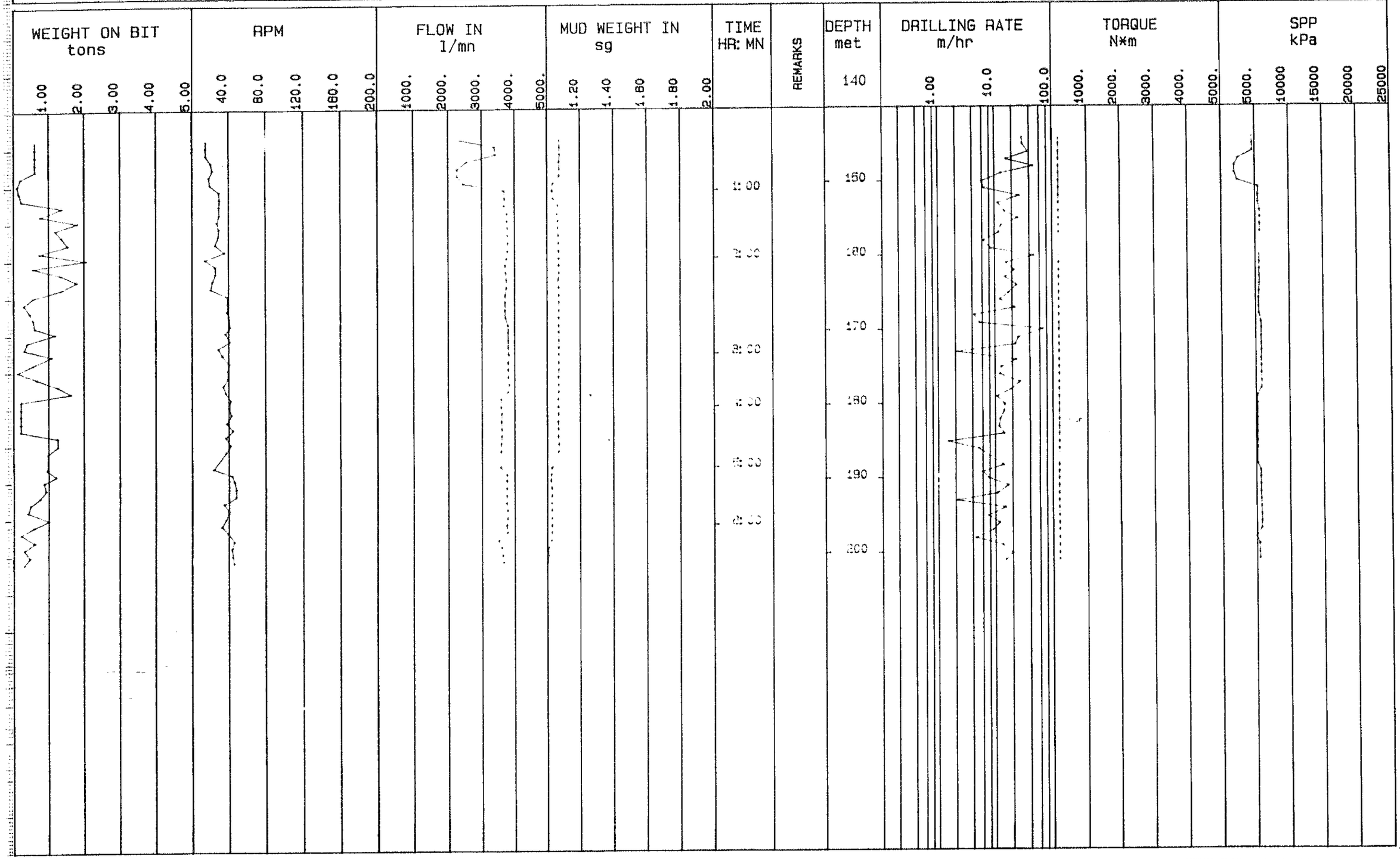
GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

17/ 4/ 82

HAMMERHEAD #1

SCALE : 1 / 500



Geoservices

ZERO

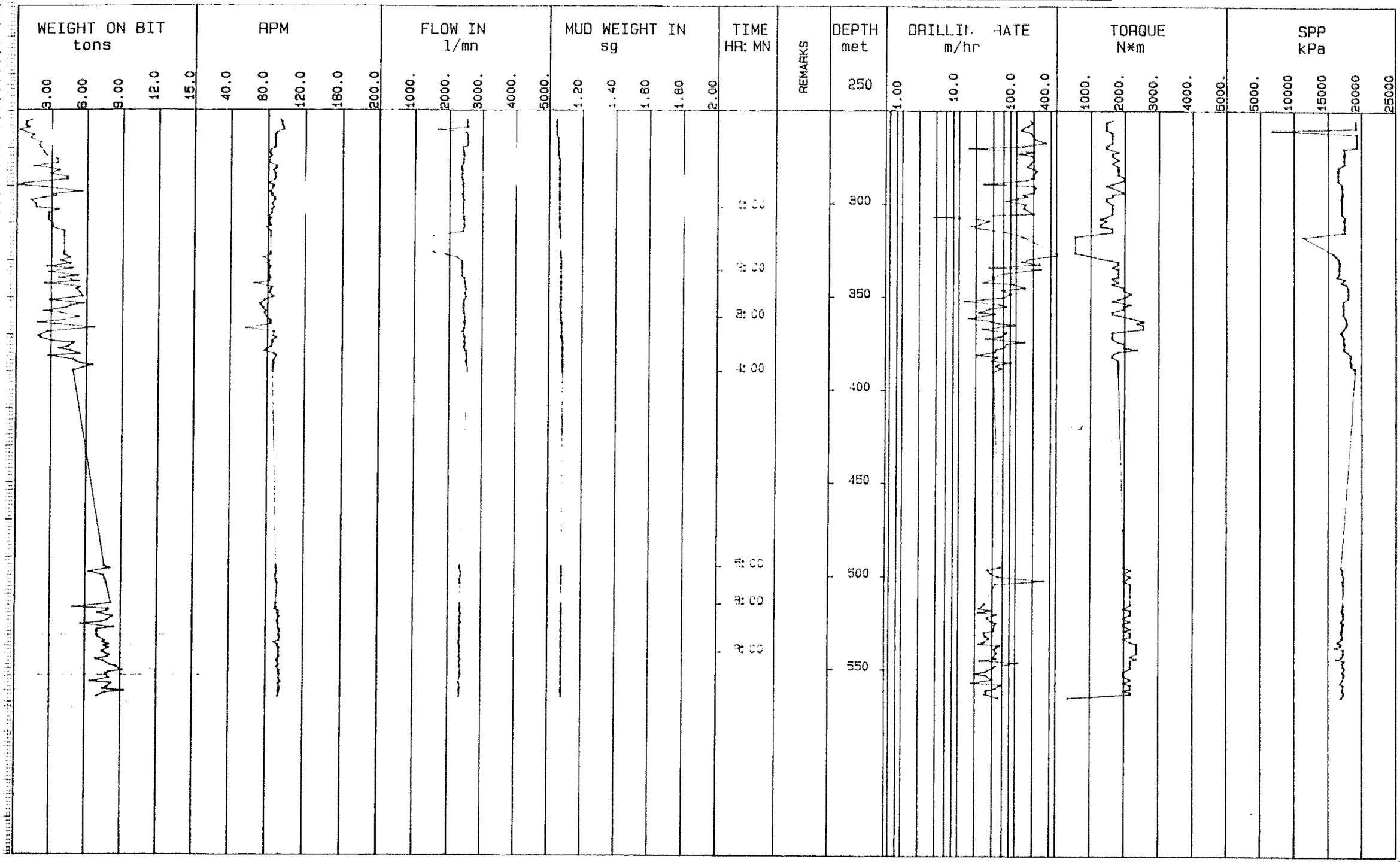
GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

19/ 5/ 82

HAMMERHEAD #1

SCALE : 1 / 2000



ZERO

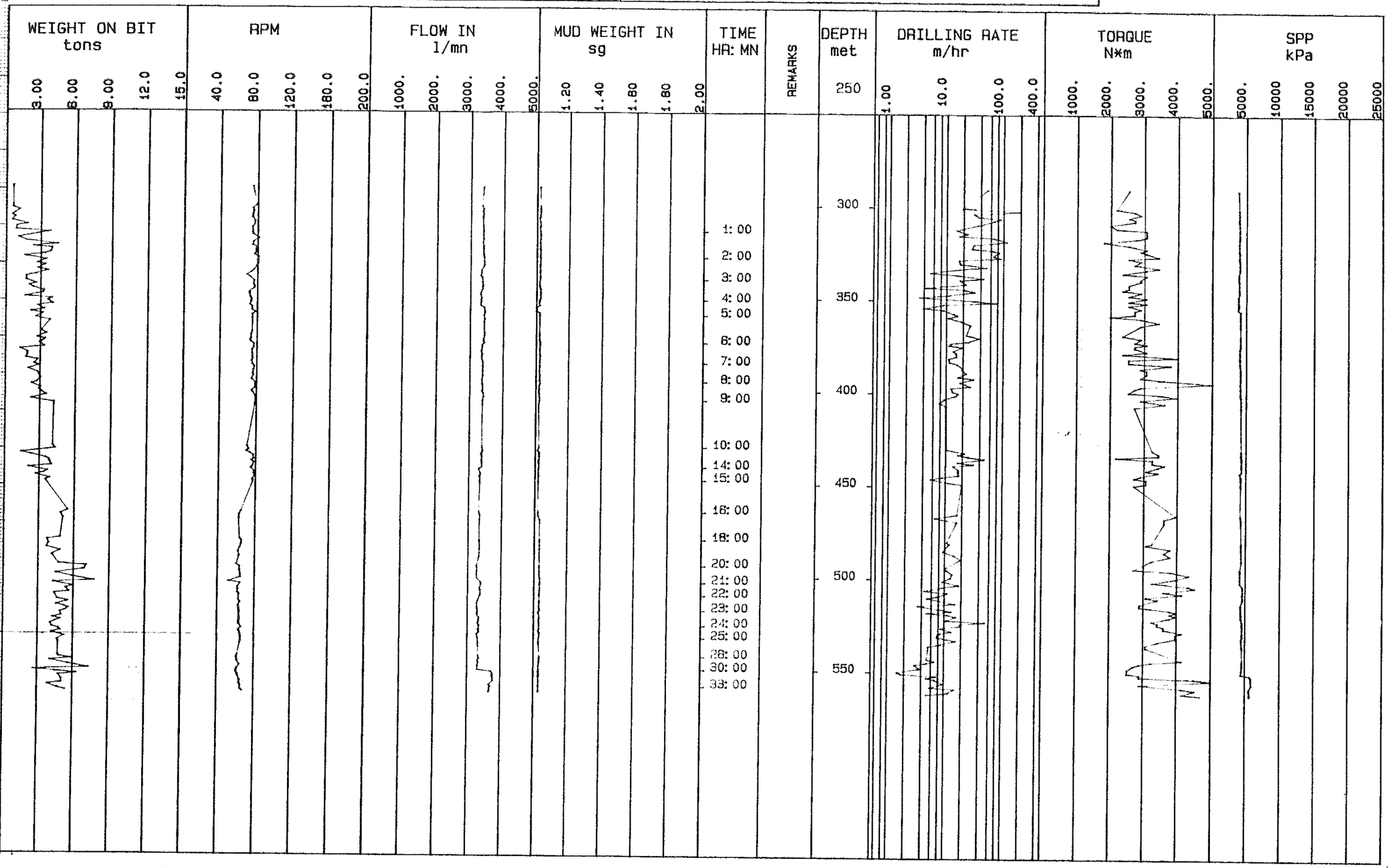
GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

25/ 5/ 82

HAMMERHEAD #1

SCALE : 1 / 2000



ZERO

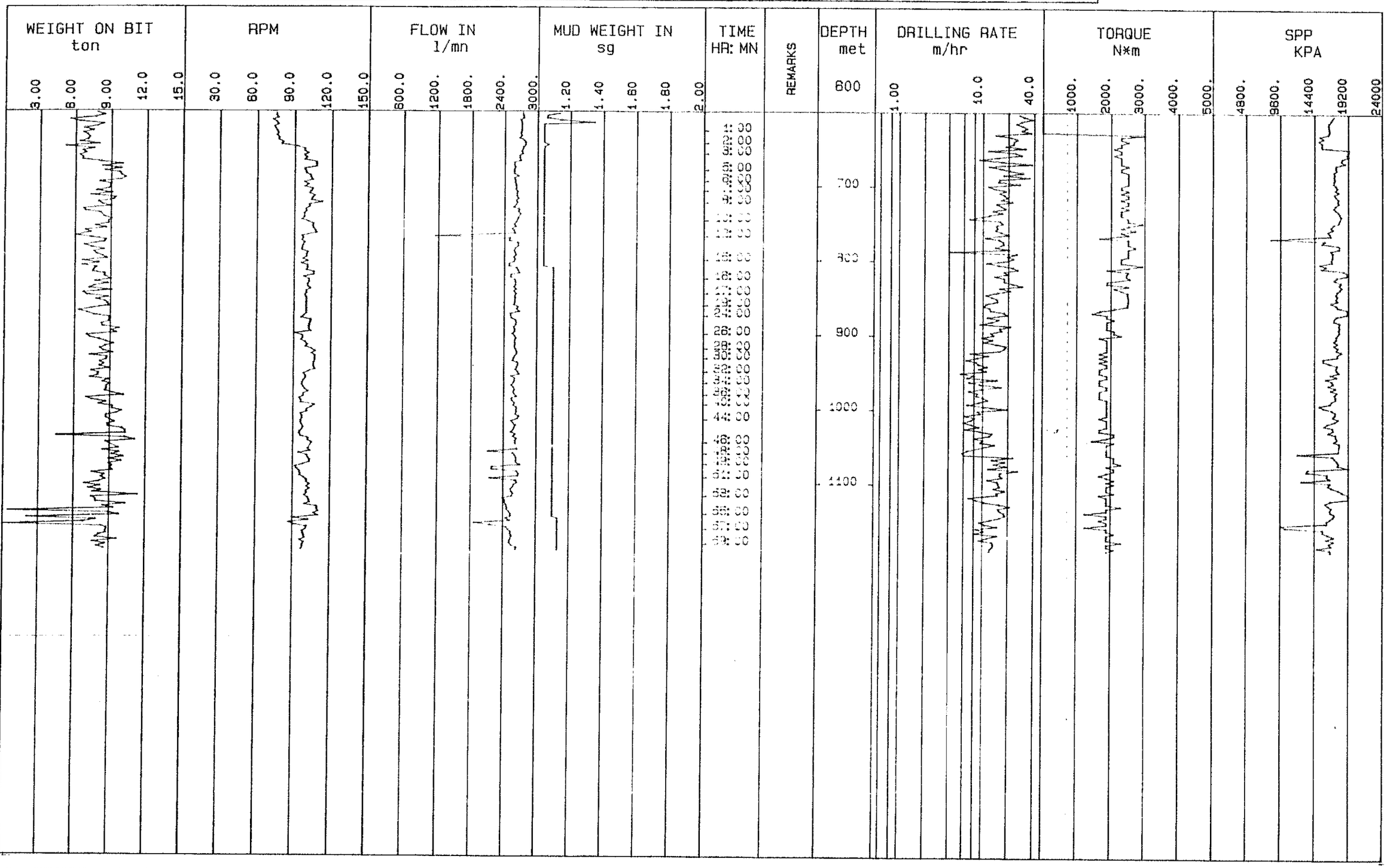
GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

8/ 6/ 82

HAMMERHEAD #1

SCALE : 1 / 5000



ZERO

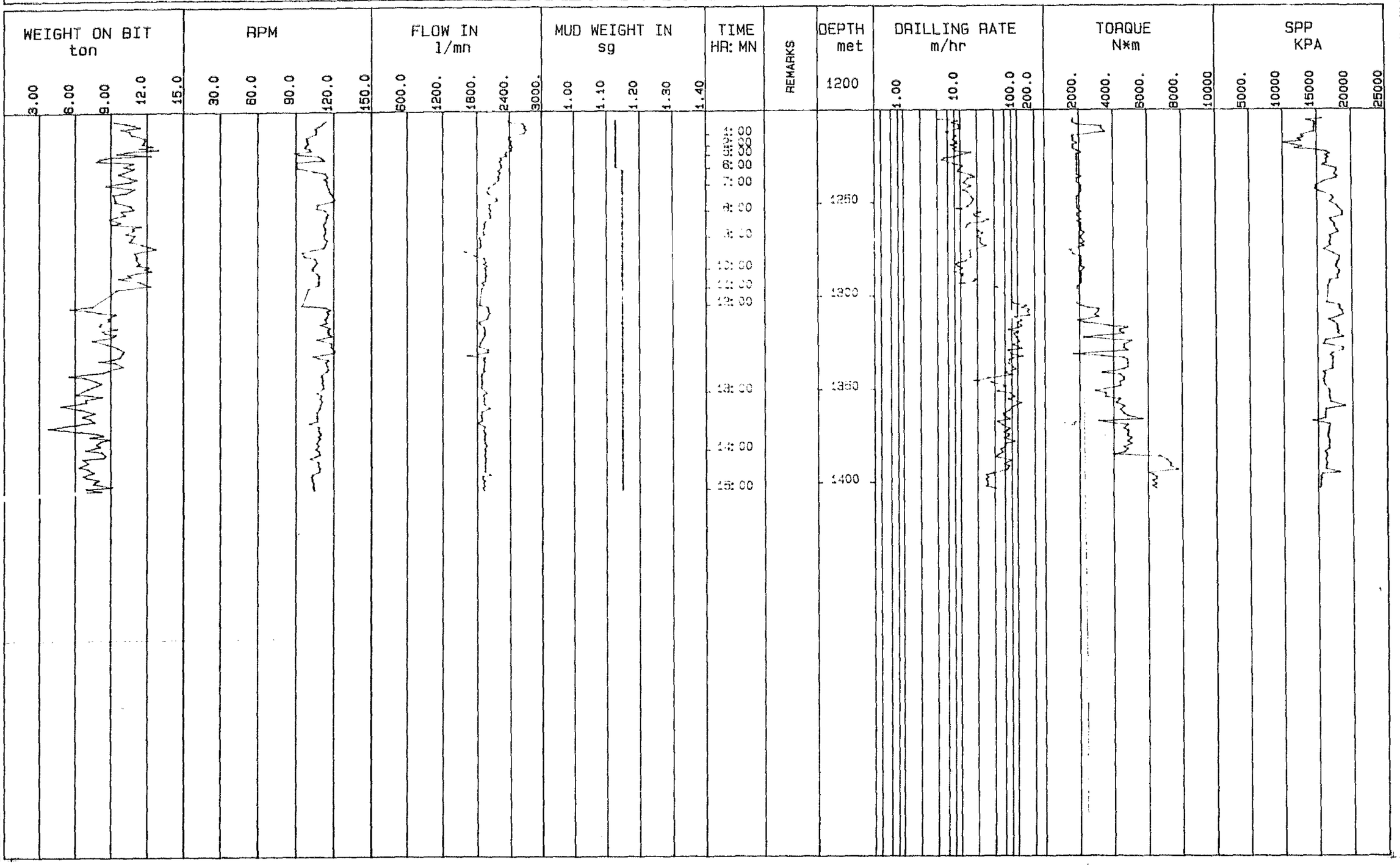
GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

10/ 6/ 82

HAMMERHEAD #1

SCALE : 1 / 2000



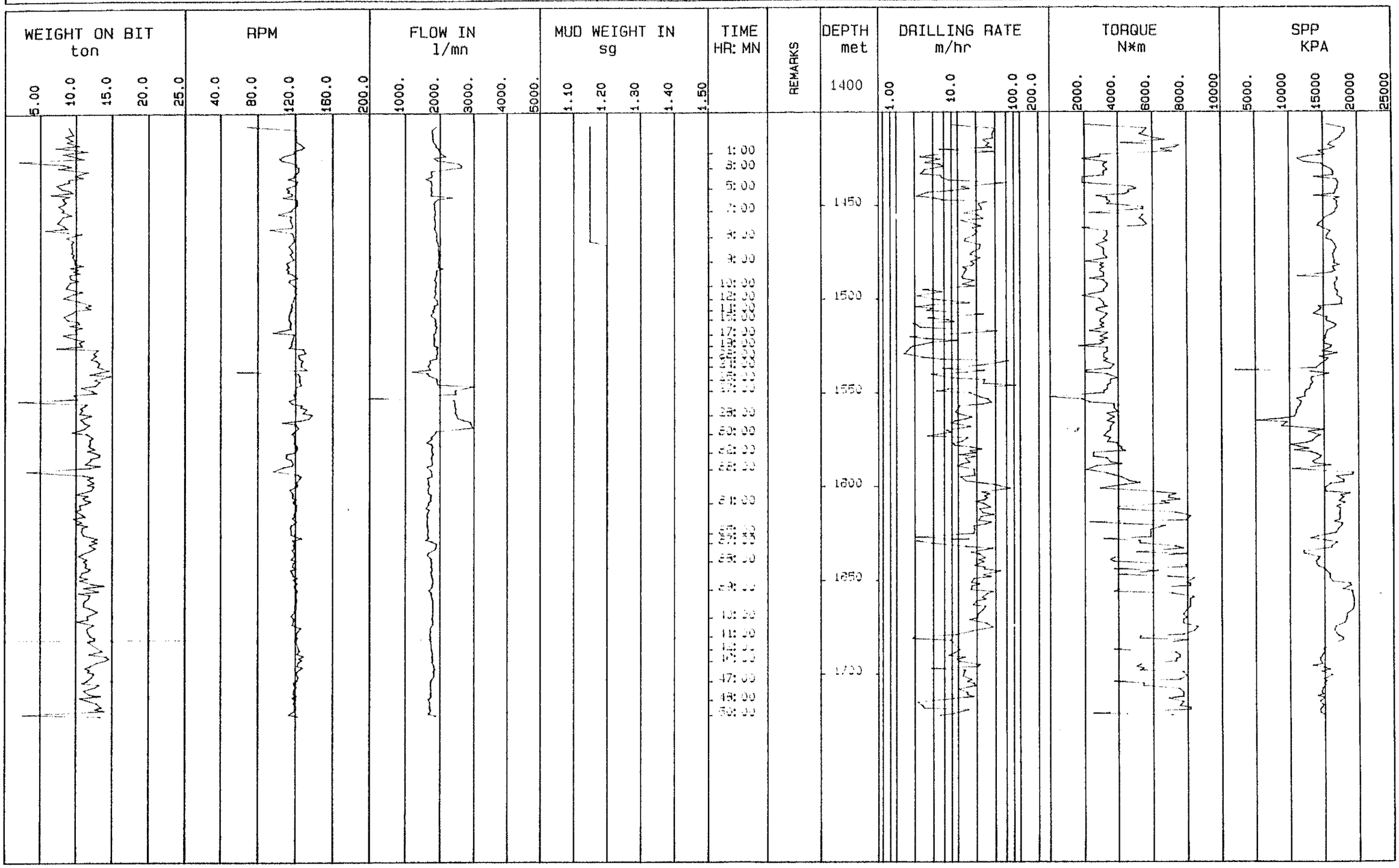
GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

12/ 6/ 82

HAMMERHEAD #1

SCALE : 1 / 2000



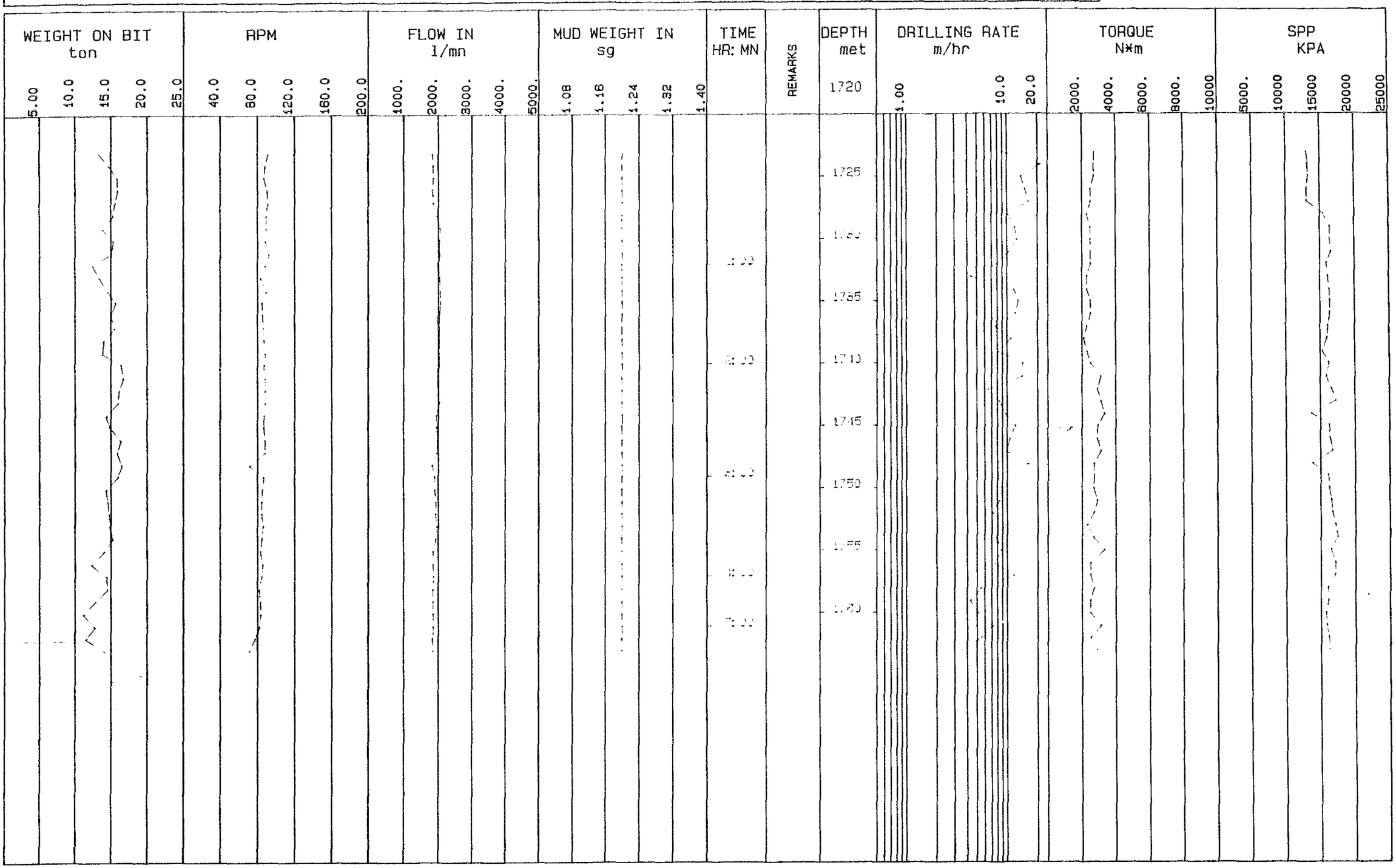
GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

13/ 6/ 82

HAMMERHEAD #1

SCALE : 1 / 300



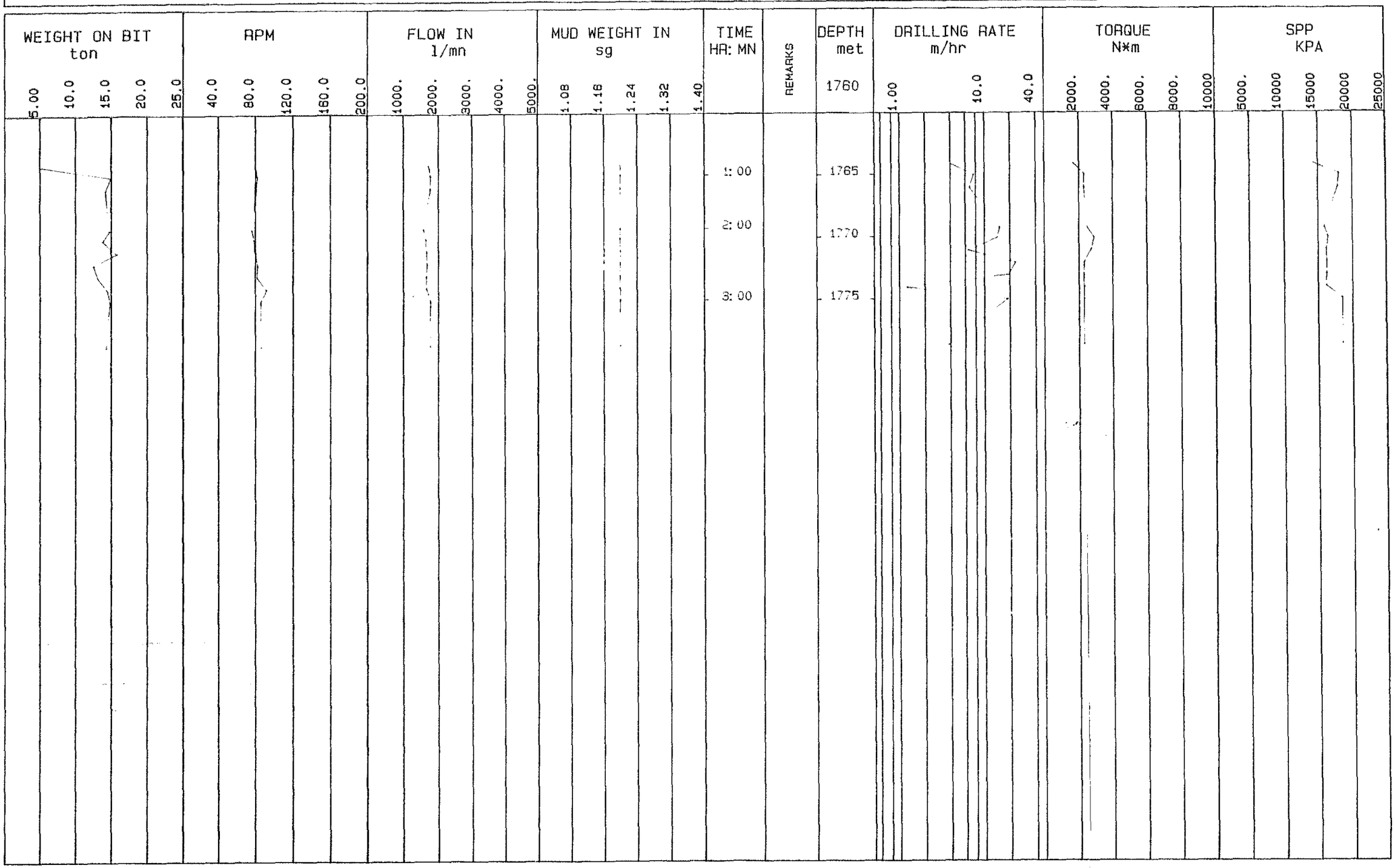
GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

13/ 6/ 82

HAMMERHEAD #1

SCALE : 1 / 300



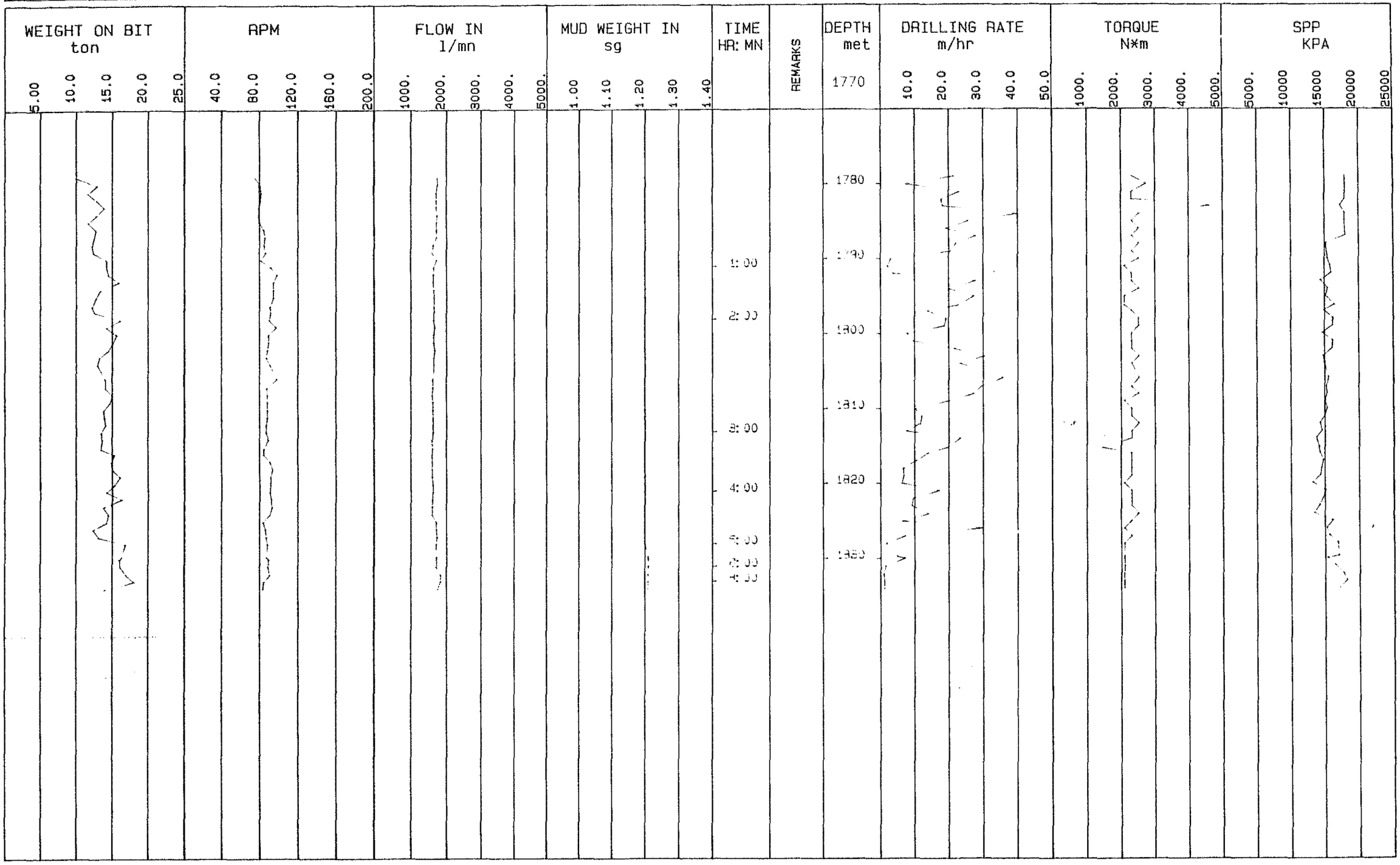
GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

14/ 6/ 82

HAMMERHEAD #1

SCALE : 1 / 500



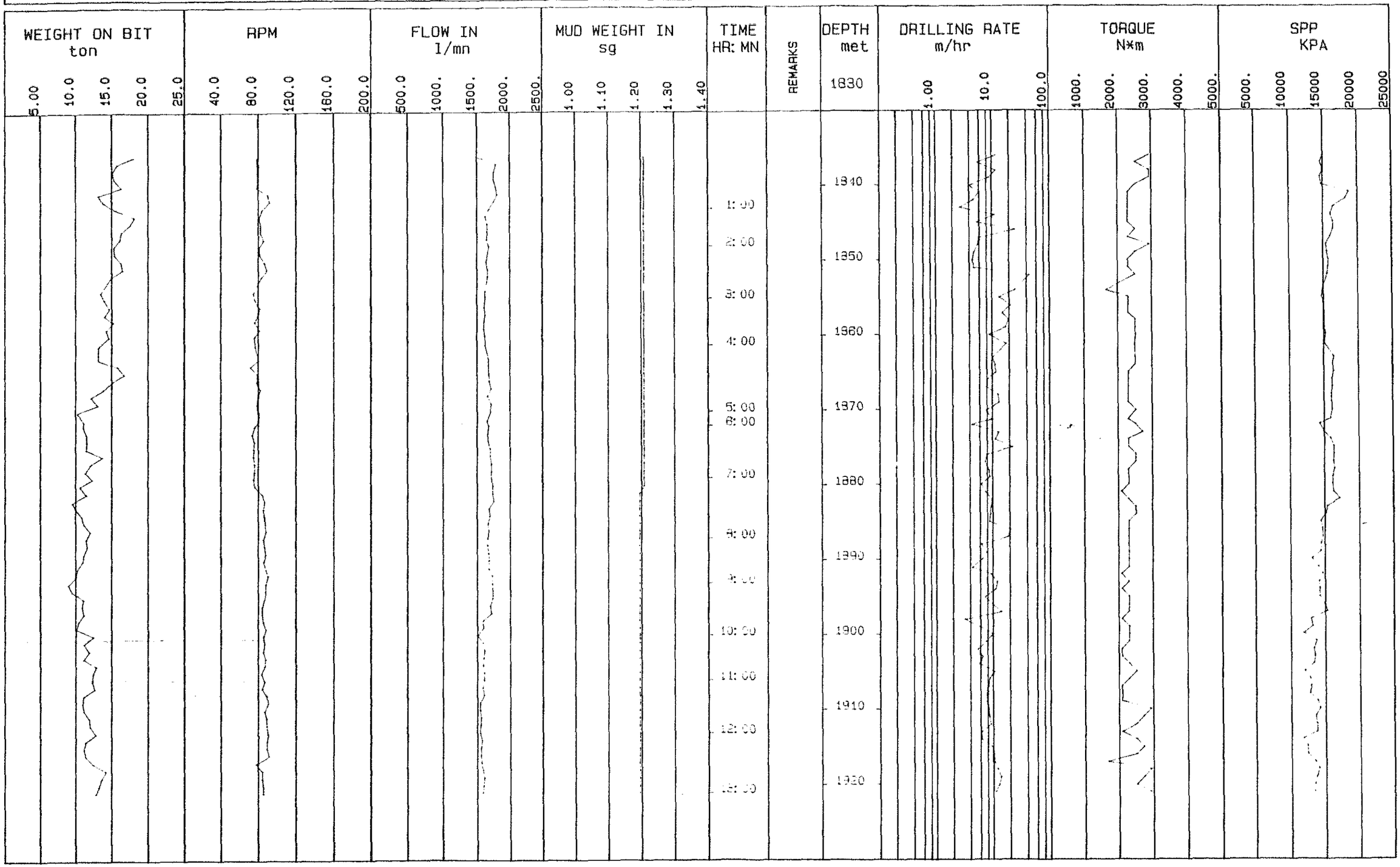
GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

15/ 6/ 82

HAMMERHEAD #1

SCALE : 1 / 500



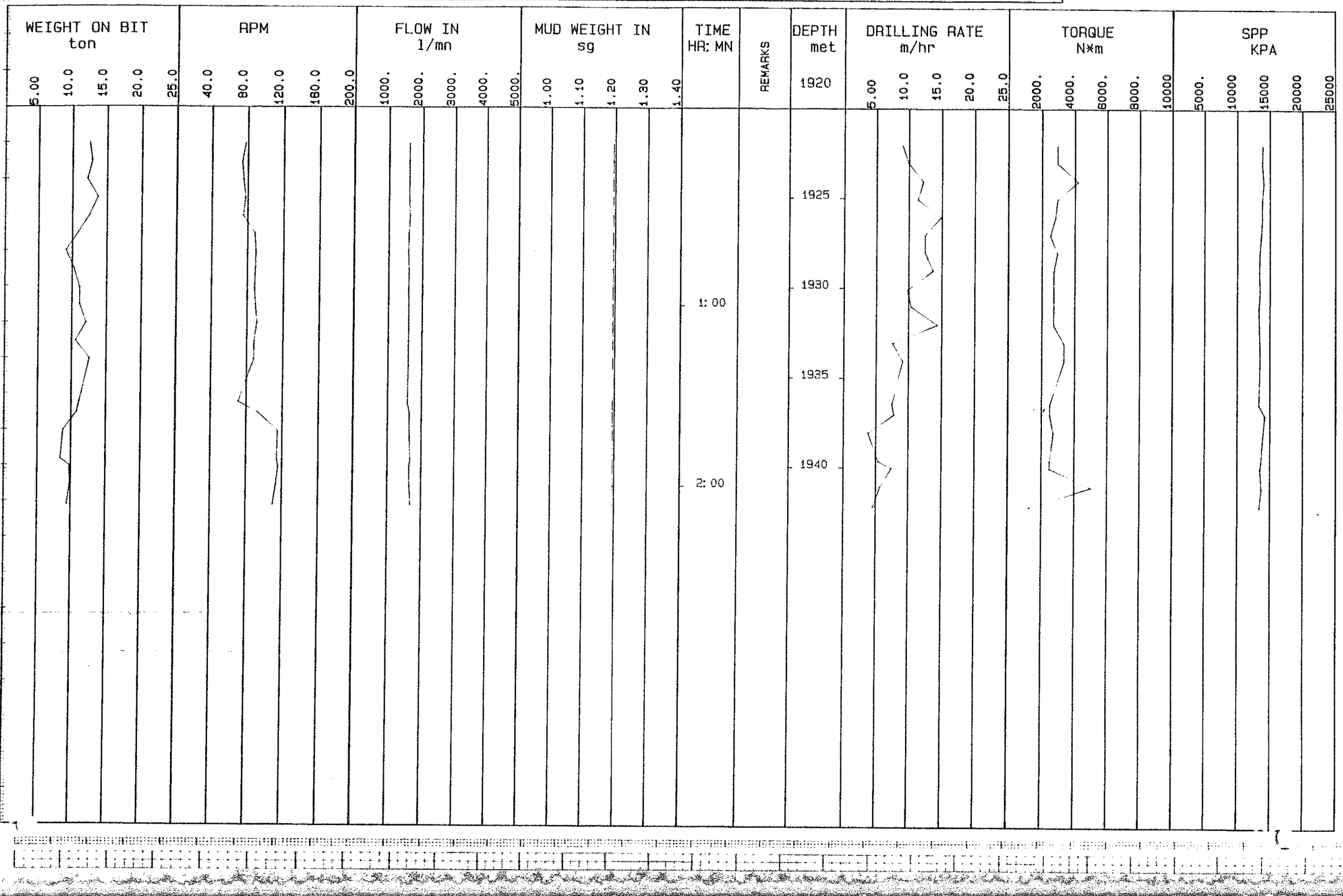
GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

15/ 6/ 82

HAMMERHEAD #1

SCALE : 1 / 200



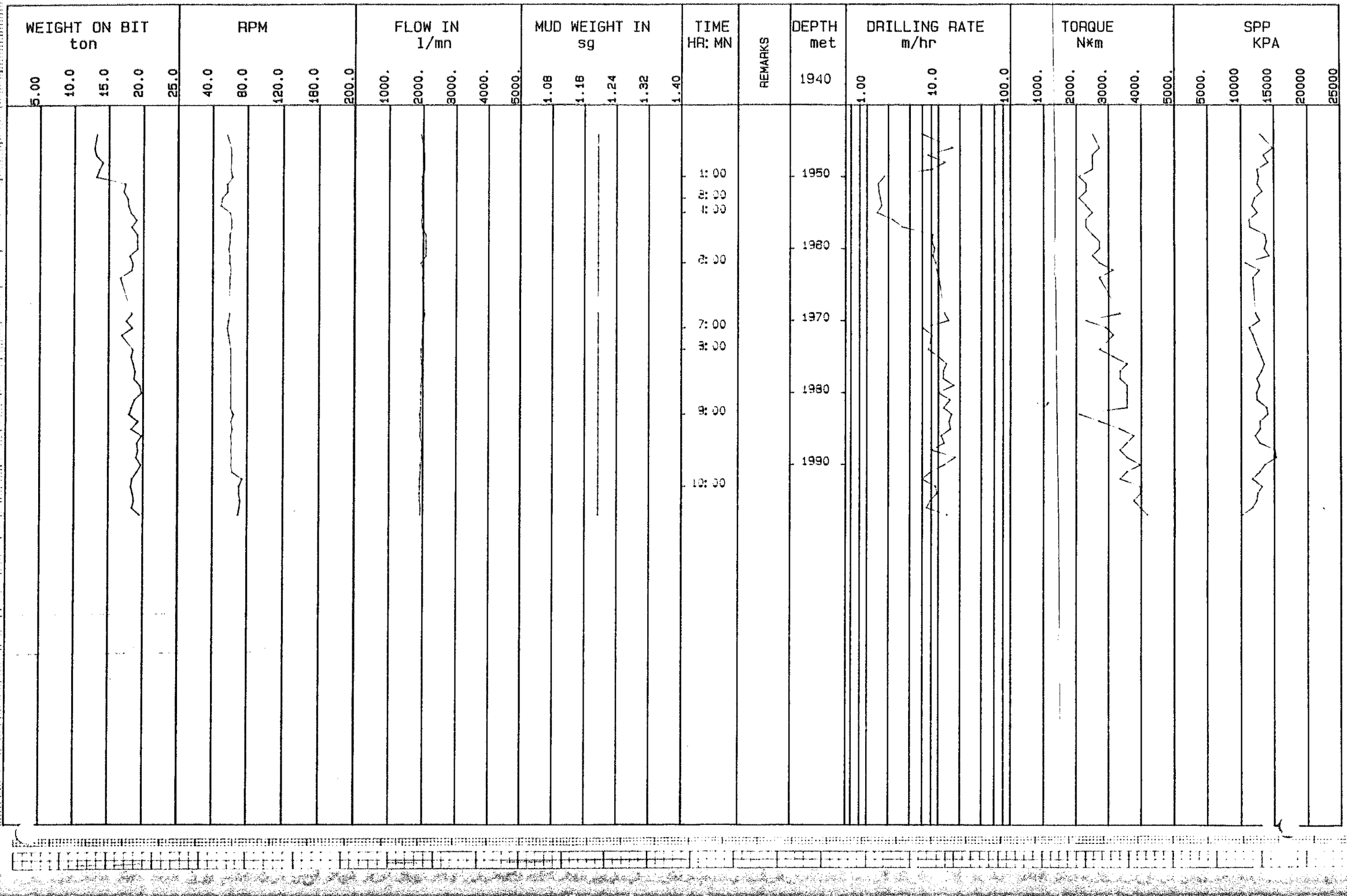
Geoservices overseas S.A.

ERO

GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

16/ 6/ 82 — HAMMERHEAD #1 — SCALE : 1 / 500



Geoservices Overseas S.A.

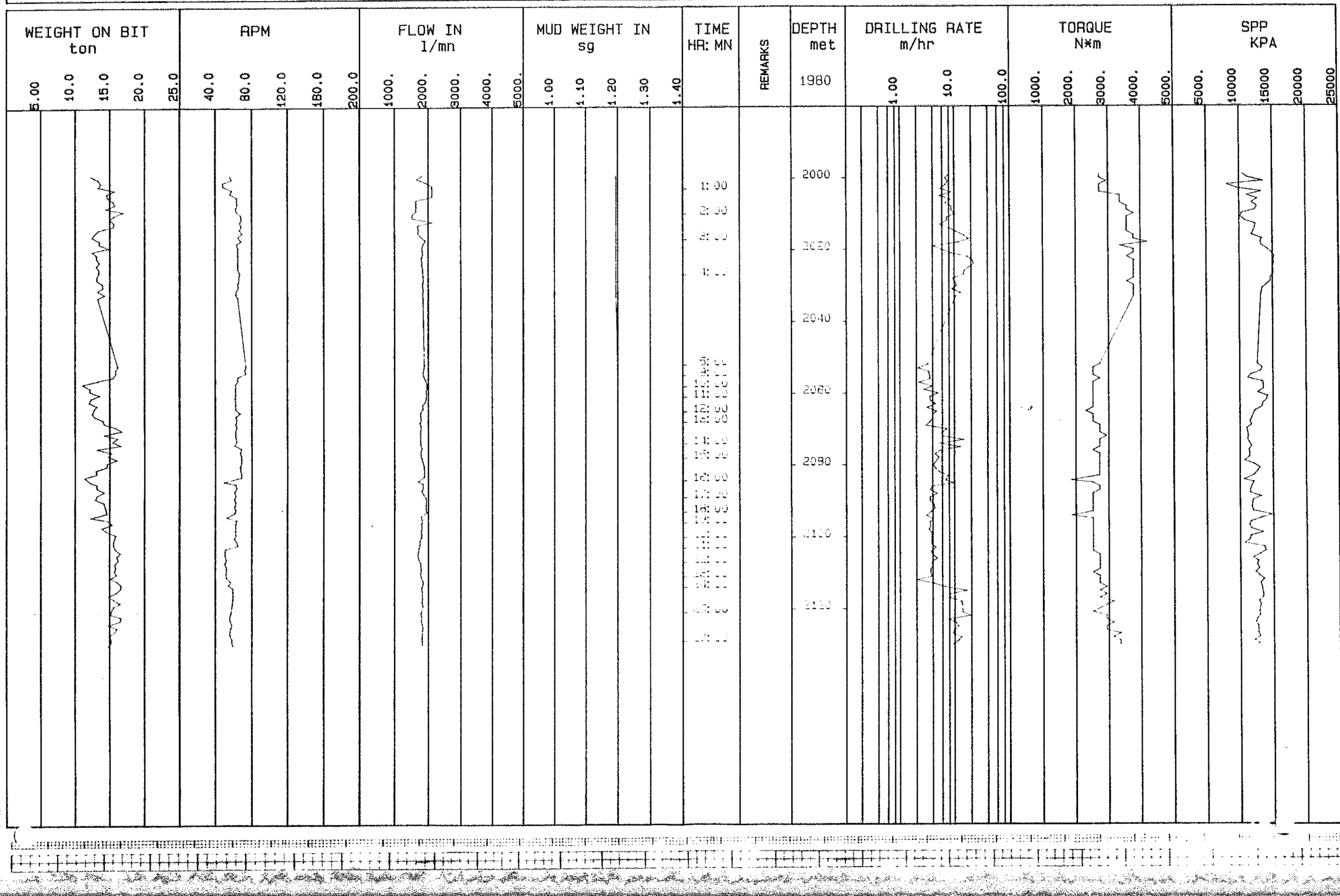
GEOSERVICES
ON-LINE TDC

BIT PERFORMANCE VERSUS DEPTH

17/ 6/ 82

HAMMERHEAD #1

SCALE : 1 / 1000



Geoservices overseas S.A.

ZERO

BIT COST PLOTS

GEOSERVICES
ON-LINE TDC

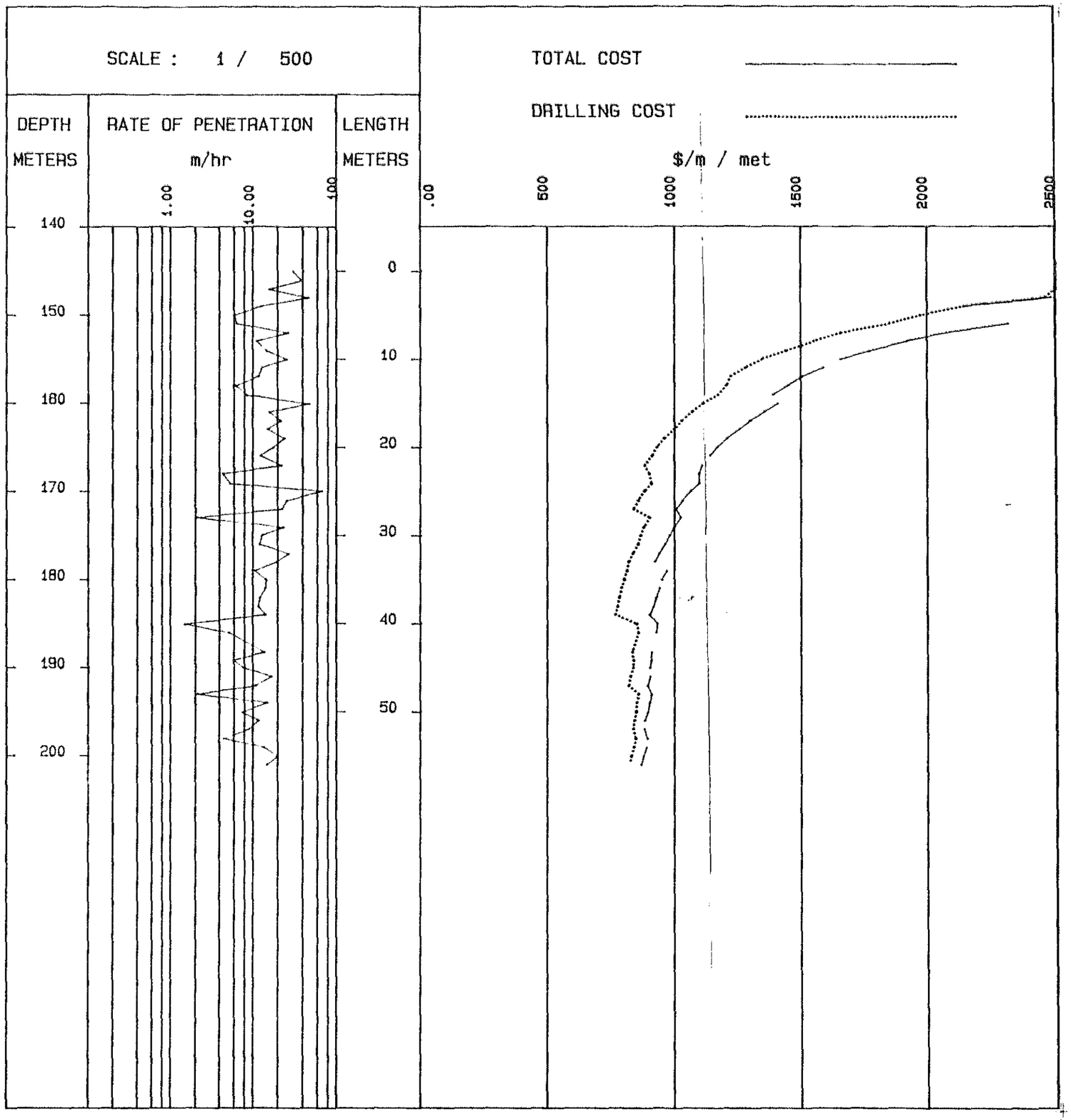
BIT COST REPORT

17/ 4/ 82 — HAMMERHEAD #1

BIT TYPE	:	TOOTH	
BIT IDENTITY	:	RD BIT &HO	
BIT SIZE	:	36.00	INCHES
BIT COST	:	0	$/m
RIG COST	:	5833	$/m (PER HOUR)
TRIP TIME	:	2.0	HRS
STARTED AT	:	143.0	met
ENDED AT	:	202.0	met
TOTAL BIT TIME	:	8.6	HRS
BOTTOM TIME	:	6.6	HRS

MINIMUM DRILLING COST

- HOUR	:	3.4	HRS
- DEPTH	:	184.0	met
- COST	:	768.9	$/m / met
FINAL TOTAL COST	:	869.0	$/m / met



GEOSERVICES
ON-LINE TDC

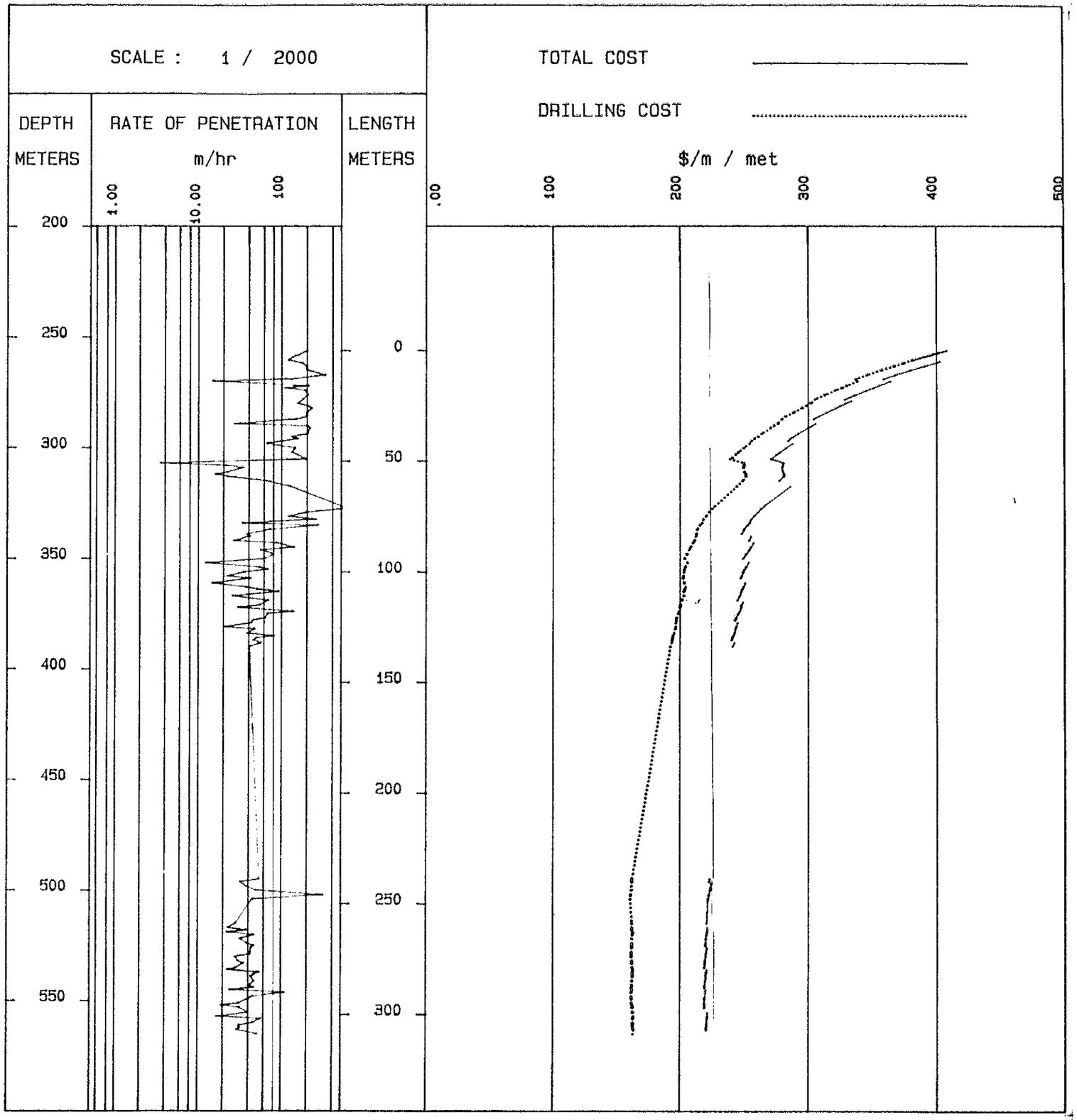
BIT COST REPORT

19/ 5/ 82 — HAMMERHEAD #1

BIT TYPE	:	TOOTH	
BIT IDENTITY	:	RD FP 12	
BIT SIZE	:	12.25	INCHES
BIT COST	:	10000	$/m
RIG COST	:	5833	$/m (PER HOUR)
TRIP TIME	:	2.0	HRS
STARTED AT	:	203.0	met
ENDED AT	:	565.0	met
TOTAL BIT TIME	:	12.0	HRS
BOTTOM TIME	:	10.0	HRS

MINIMUM DRILLING COST

- HOUR	:	4.6	HRS
- DEPTH	:	505.1	met
- COST	:	161.3	$/m / met
FINAL TOTAL COST	:	220.7	$/m / met

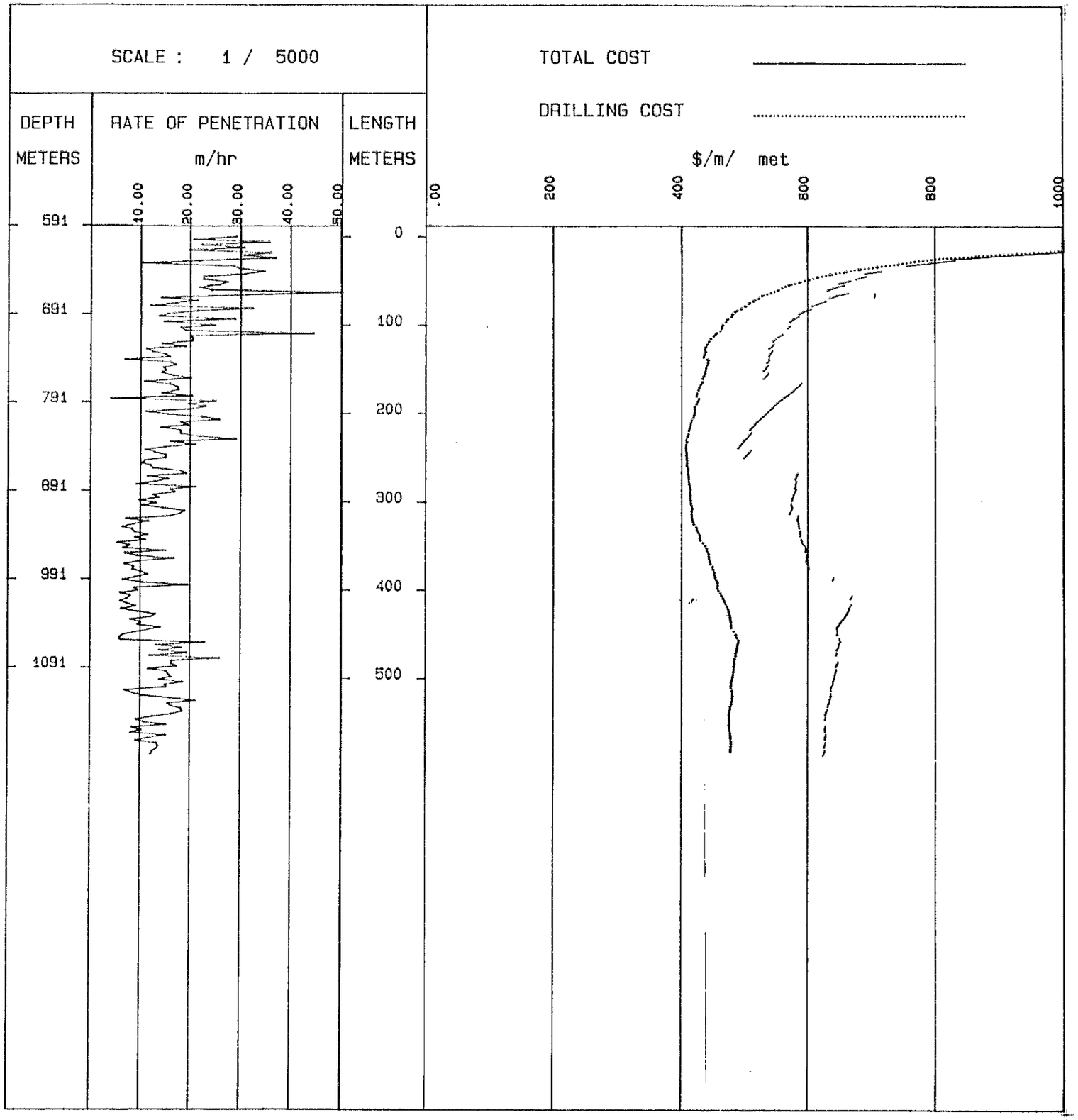


GEOSERVICES
ON-LINE TDC

BIT COST REPORT

8/ 6/ 82 HAMMERHEAD #1

BIT TYPE	:	M/TOOT	
BIT IDENTITY	:	HTC J1	
BIT SIZE	:	12.25	INCHES
BIT COST	:	7500	$/m
RIG COST	:	5833	$/m (PER HOUR)
TRIP TIME	:	3.0	HRS
STARTED AT	:	591.0	met
ENDED AT	:	1200	met
TOTAL BIT TIME	:	62.8	HRS
BOTTOM TIME	:	59.8	HRS
MINIMUM DRILLING COST			
- HOUR	:	13.1	HRS
- DEPTH	:	840.0	met
- COST	:	406.2	$/m/ met
FINAL TOTAL COST	:	624.5	$/m/ met



GEOSERVICES
ON-LINE TDC

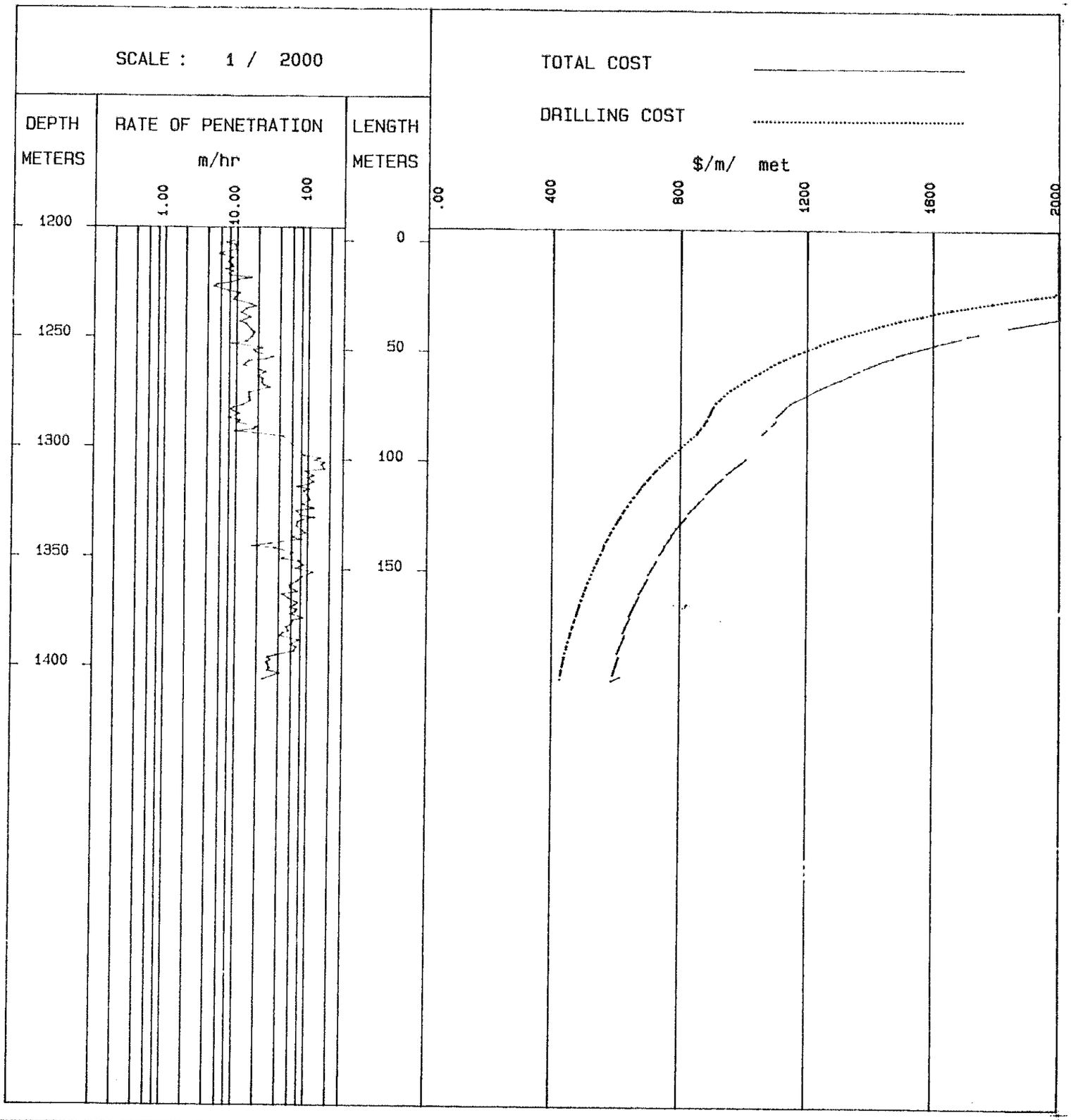
BIT COST REPORT

10/ 6/ 82 — HAMMERHEAD #1

BIT TYPE	:	TOOTH	
BIT IDENTITY	:	REED S13	
BIT SIZE	:	8.50	INCHES
BIT COST	:	7000	$/m
RIG COST	:	5833	$/m (PER HOUR)
TRIP TIME	:	4.0	HRS
STARTED AT	:	1204.5	met
ENDED AT	:	1406.0	met
TOTAL BIT TIME	:	19.1	HRS
BOTTOM TIME	:	15.1	HRS

MINIMUM DRILLING COST

- HOUR	:	9.6	HRS
- DEPTH	:	1406.0	met
- COST	:	428.0	$/m/ met
FINAL TOTAL COST	:	588.8	$/m/ met

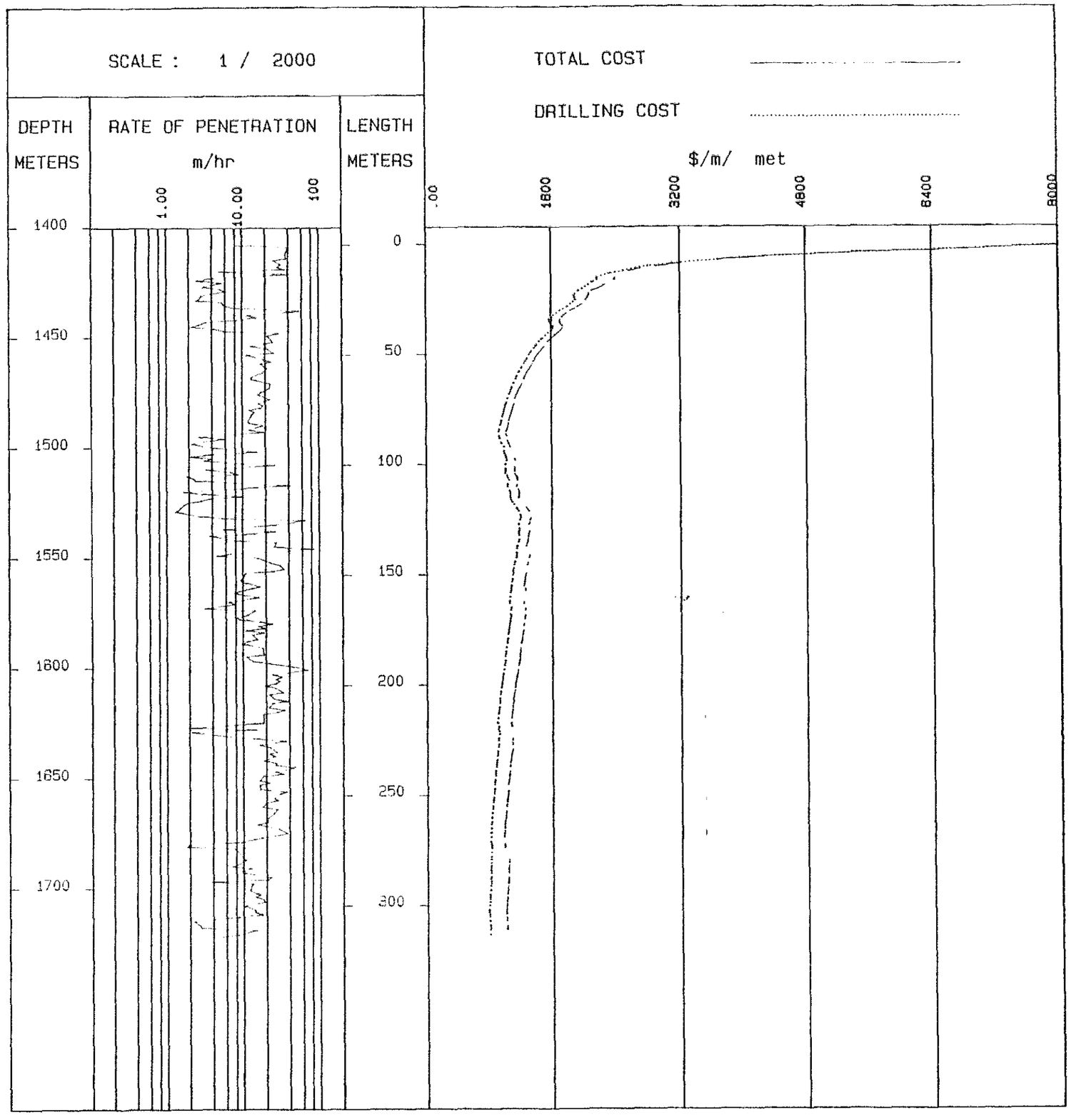


GEOSERVICES
ON-LINE TDC

BIT COST REPORT

13/ 6/ 82	HAMMERHEAD #1

BIT TYPE	:	INSERT	
BIT IDENTITY	:	REED HSS1	
BIT SIZE	:	8.50	INCHES
BIT COST	:	8000	$/m
RIG COST	:	5833	$/m (PER HOUR)
TRIP TIME	:	4.0	HRS
STARTED AT	:	1406.0	met
ENDED AT	:	1722.5	met
TOTAL BIT TIME	:	54.0	HRS
BOTTOM TIME	:	50.0	HRS
MINIMUM DRILLING COST			
- HOUR	:	36.7	HRS
- DEPTH	:	1714.1	met
- COST	:	796.1	$/m/ met
FINAL TOTAL COST	:	1022.1	$/m/ met



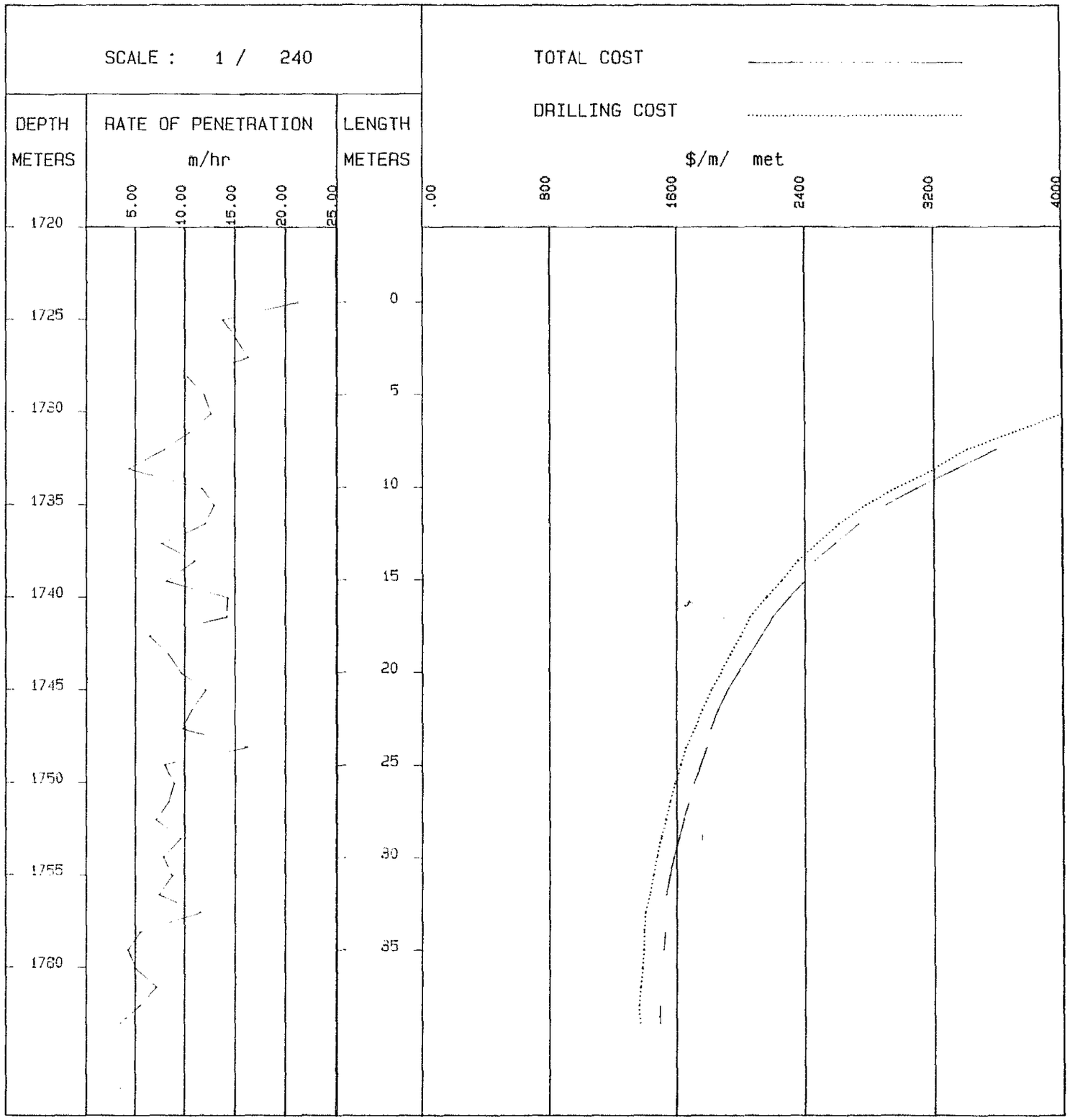
GEOSERVICES
ON-LINE TDC

BIT COST REPORT

13/ 6/ 82	HAMMERHEAD #1

BIT TYPE	:	TOOTH	
BIT IDENTITY	:	SEC S11	
BIT SIZE	:	8.50	INCHES
BIT COST	:	5000	$/m
RIG COST	:	5833	$/m (PER HOUR)
TRIP TIME	:	4.0	HRS
STARTED AT	:	1722.5	met

ENDED AT	:	1763.2	met
TOTAL BIT TIME	:	9.5	HRS
BOTTOM TIME	:	5.5	HRS
MINIMUM DRILLING COST			
- HOUR	:	4.4	HRS
- DEPTH	:	1762.1	met
- COST	:	1365.7	$/m/ met
FINAL TOTAL COST	:	1495.4	$/m/ met

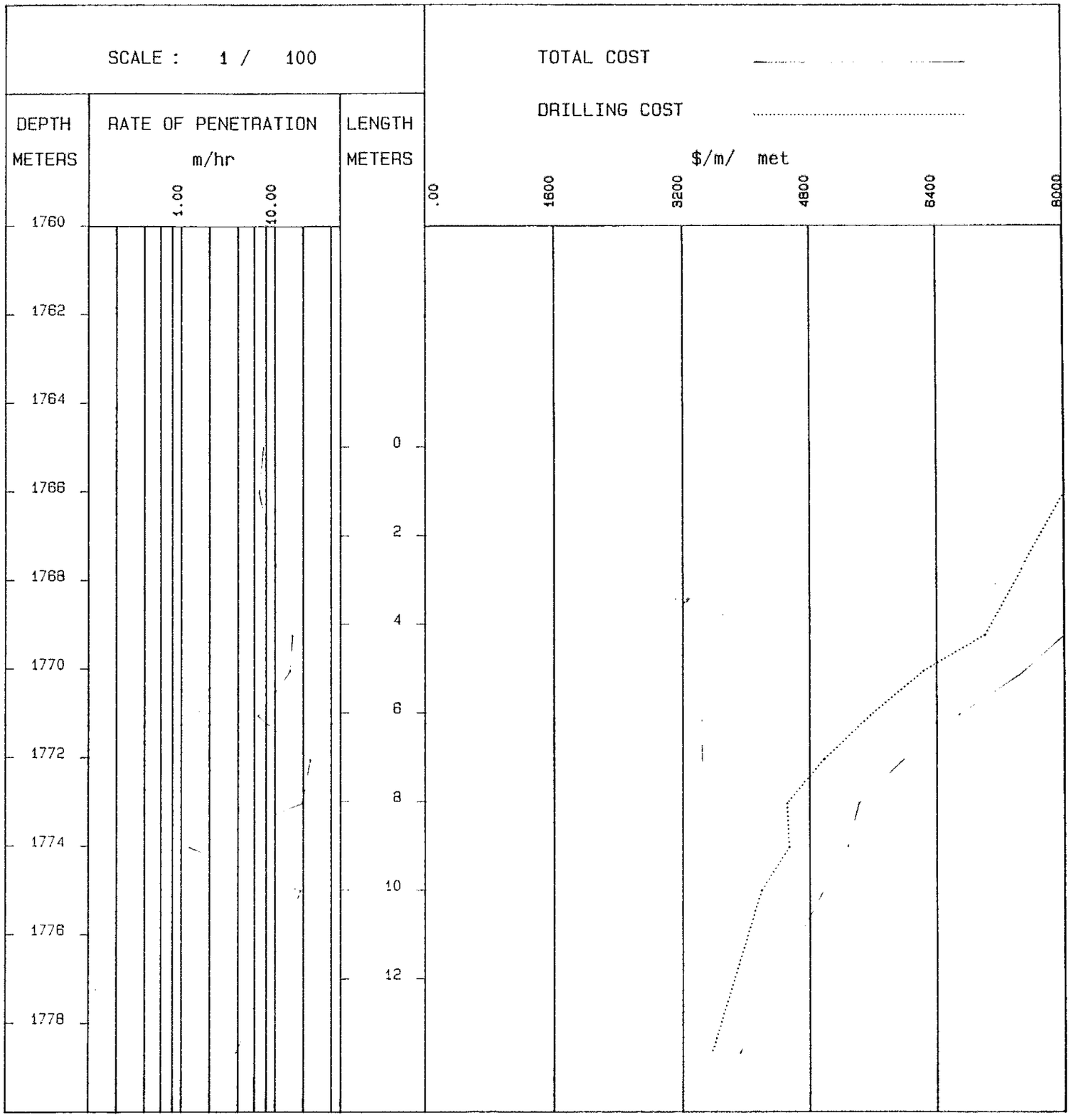


GEOSERVICES
ON-LINE TDC

BIT COST REPORT

13/ 6/ 82 HAMMERHEAD #1

BIT TYPE	:	TOOTH	
BIT IDENTITY	:	HTC JD8	
BIT SIZE	:	8.50	INCHES
BIT COST	:	5000	$/m
RIG COST	:	5833	$/m (PER HOUR)
TRIP TIME	:	6.0	HRS
STARTED AT	:	1763.2	met
ENDED AT	:	1778.7	met
TOTAL BIT TIME	:	9.6	HRS
BOTTOM TIME	:	3.6	HRS
MINIMUM DRILLING COST			
- HOUR	:	2.6	HRS
- DEPTH	:	1778.7	met
- COST	:	3560.7	$/m/ met
FINAL TOTAL COST	:	3912.5	$/m/ met



GEOSERVICES
ON-LINE TDC

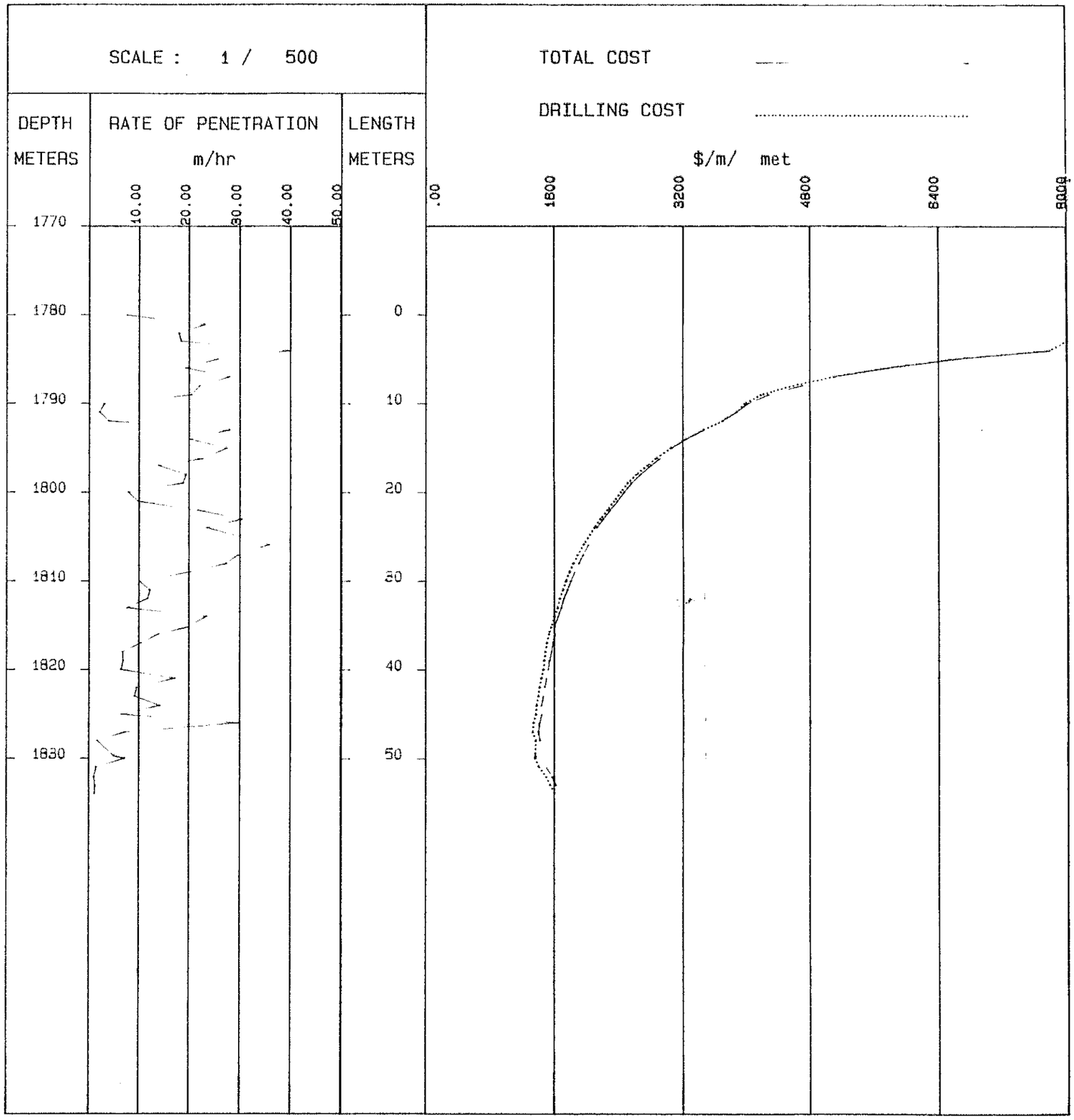
BIT COST REPORT

14/ 6/ 82 HAMMERHEAD #1

BIT TYPE	:	TOOTH	
BIT IDENTITY	:	HTC J7	
BIT SIZE	:	8.50	INCHES
BIT COST	:	5000	$/m
RIG COST	:	5833	$/m (PER HOUR)
TRIP TIME	:	6.0	HRS
STARTED AT	:	1778.7	met
ENDED AT	:	1834.7	met
TOTAL BIT TIME	:	15.2	HRS
BOTTOM TIME	:	9.2	HRS

MINIMUM DRILLING COST

- HOUR	:	4.2	HRS
- DEPTH	:	1827.1	met
- COST	:	1335.2	$/m/ met
FINAL TOTAL COST	:	1697.1	$/m/ met

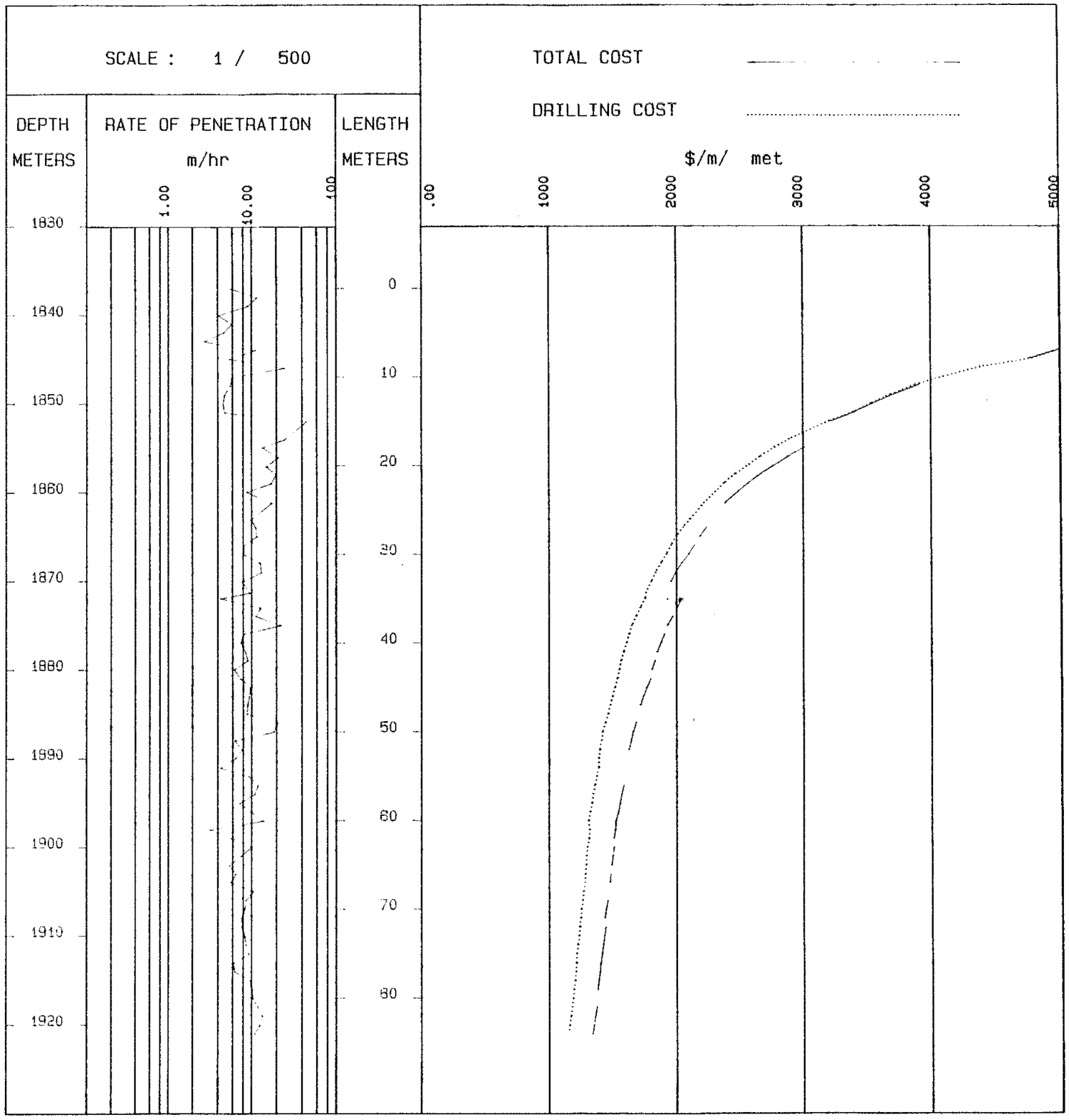


GEOSERVICES
ON-LINE TDC

BIT COST REPORT

15/ 6/ 82	HAMMERHEAD #1

BIT TYPE	:	TOOTH	
BIT IDENTITY	:	HTC J3	
BIT SIZE	:	8.50	INCHES
BIT COST	:	5000	$/m
RIG COST	:	5833	$/m (PER HOUR)
TRIP TIME	:	6.0	HRS
STARTED AT	:	1834.7	met
ENDED AT	:	1921.2	met
TOTAL BIT TIME	:	19.0	HRS
BOTTOM TIME	:	13.0	HRS
MINIMUM DRILLING COST			
- HOUR	:	10.3	HRS
- DEPTH	:	1921.0	met
- COST	:	1155.9	$/m/ met
FINAL TOTAL COST	:	1341.6	$/m/ met



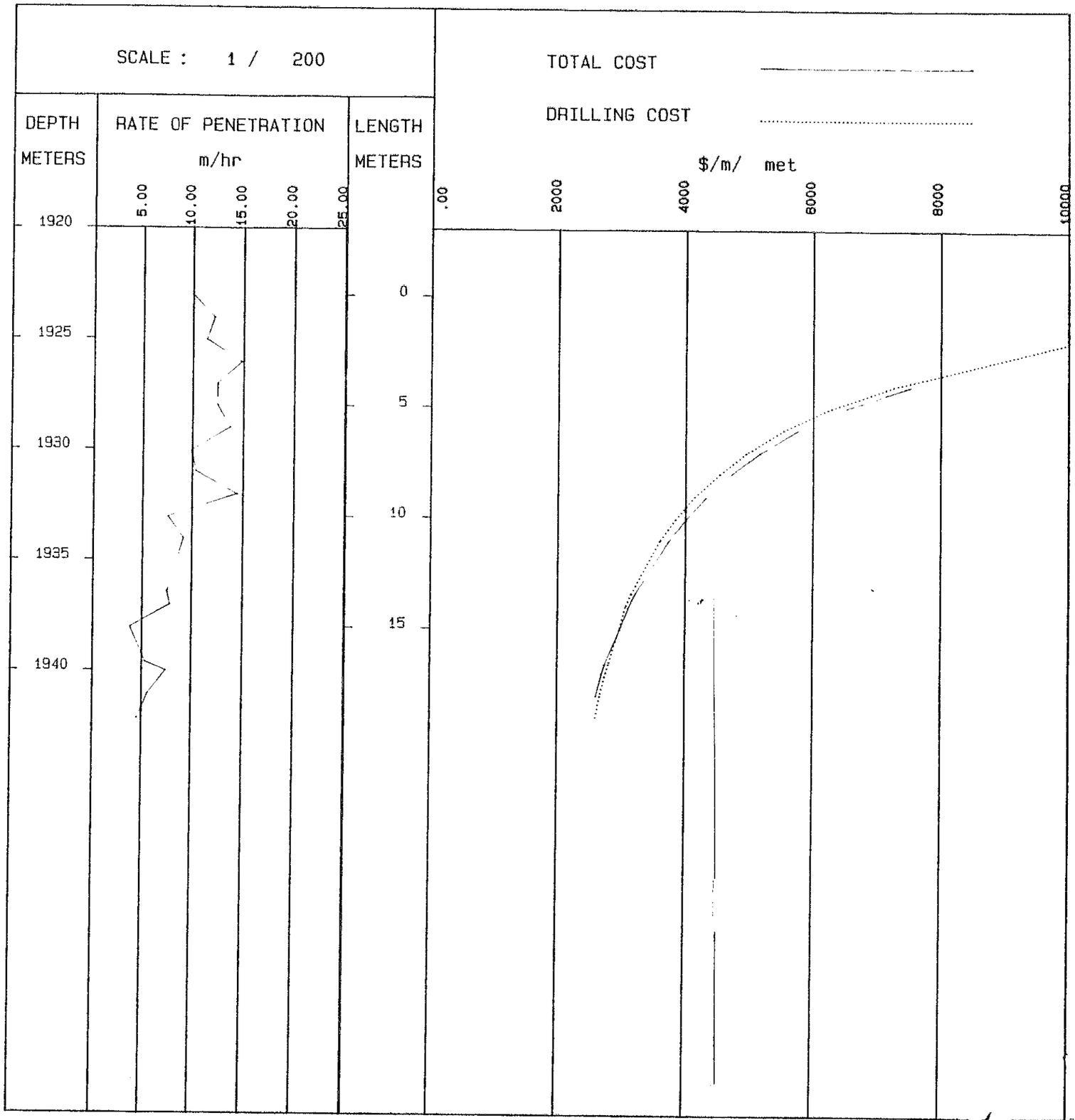
GEOSERVICES
ON-LINE TDC

BIT COST REPORT

15/ 6/ 82 — HAMMERHEAD #1

BIT TYPE	:	TOOTH	
BIT IDENTITY	:	HTC J3	
BIT SIZE	:	8.50	INCHES
BIT COST	:	5000	$/m
RIG COST	:	5833	$/m (PER HOUR)
TRIP TIME	:	6.0	HRS
STARTED AT	:	1921.2	met

ENDED AT	:	1942.2	met
TOTAL BIT TIME	:	8.9	HRS
BOTTOM TIME	:	2.9	HRS
MINIMUM DRILLING COST			
- HOUR	:	2.5	HRS
- DEPTH	:	1942.2	met
- COST	:	2605.1	$/m/ met
FINAL TOTAL COST	:	2726.5	$/m/ met



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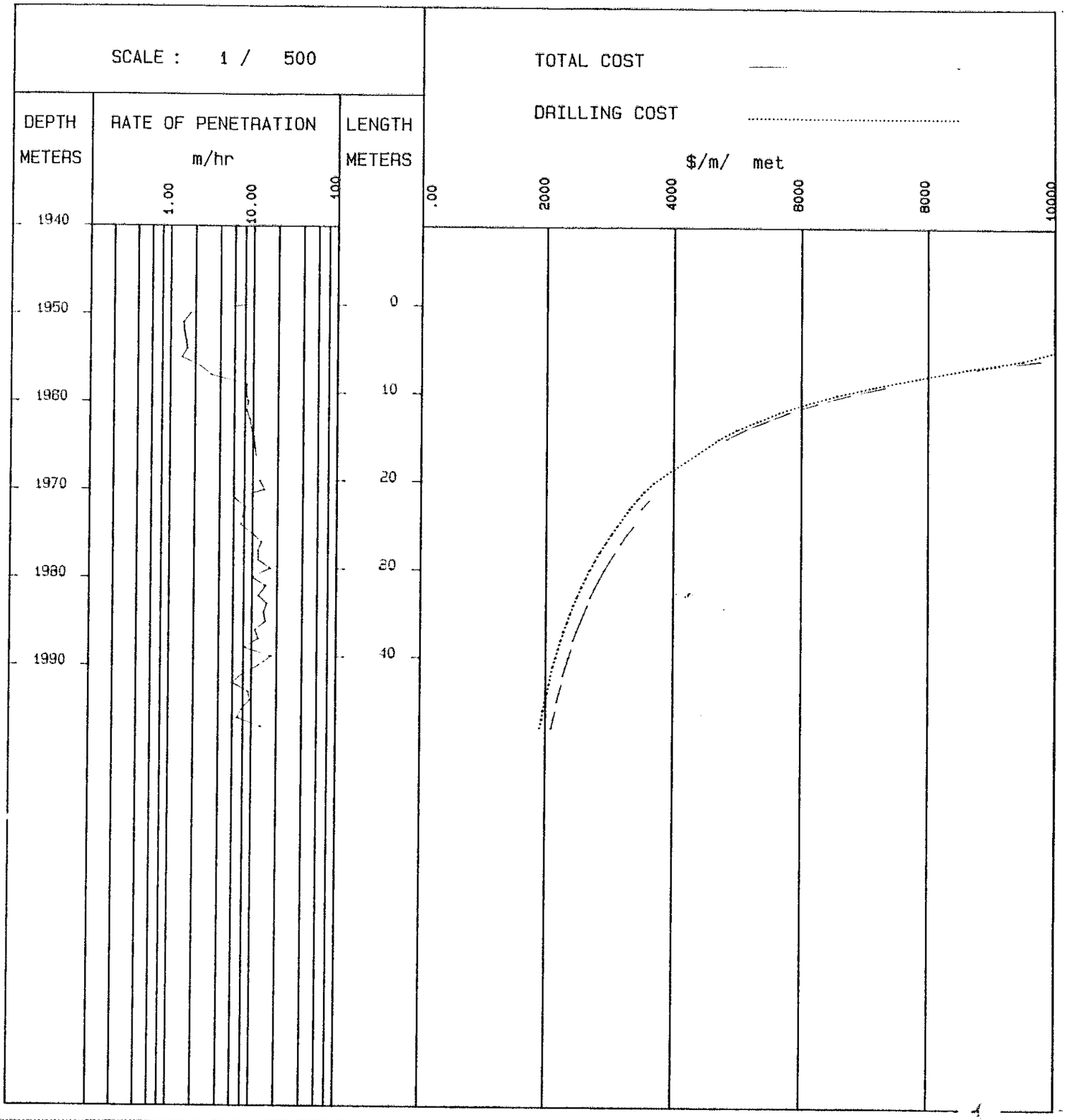
GEOSERVICES
ON-LINE TDC

BIT COST REPORT

16/ 6/ 82	HAMMERHEAD #1

BIT TYPE	:	INSERT	
BIT IDENTITY	:	HTC J33	
BIT SIZE	:	8.50	INCHES
BIT COST	:	8000	$/m
RIG COST	:	5833	$/m (PER HOUR)
TRIP TIME	:	6.0	HRS
STARTED AT	:	1948.0	met

ENDED AT	:	1997.9	met
TOTAL BIT TIME	:	16.2	HRS
BOTTOM TIME	:	10.2	HRS
MINIMUM DRILLING COST			
- HOUR	:	8.7	HRS
- DEPTH	:	1997.0	met
- COST	:	1918.1	$/m/ met
FINAL TOTAL COST	:	2093.0	$/m/ met



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GEOSERVICES
ON-LINE TDC

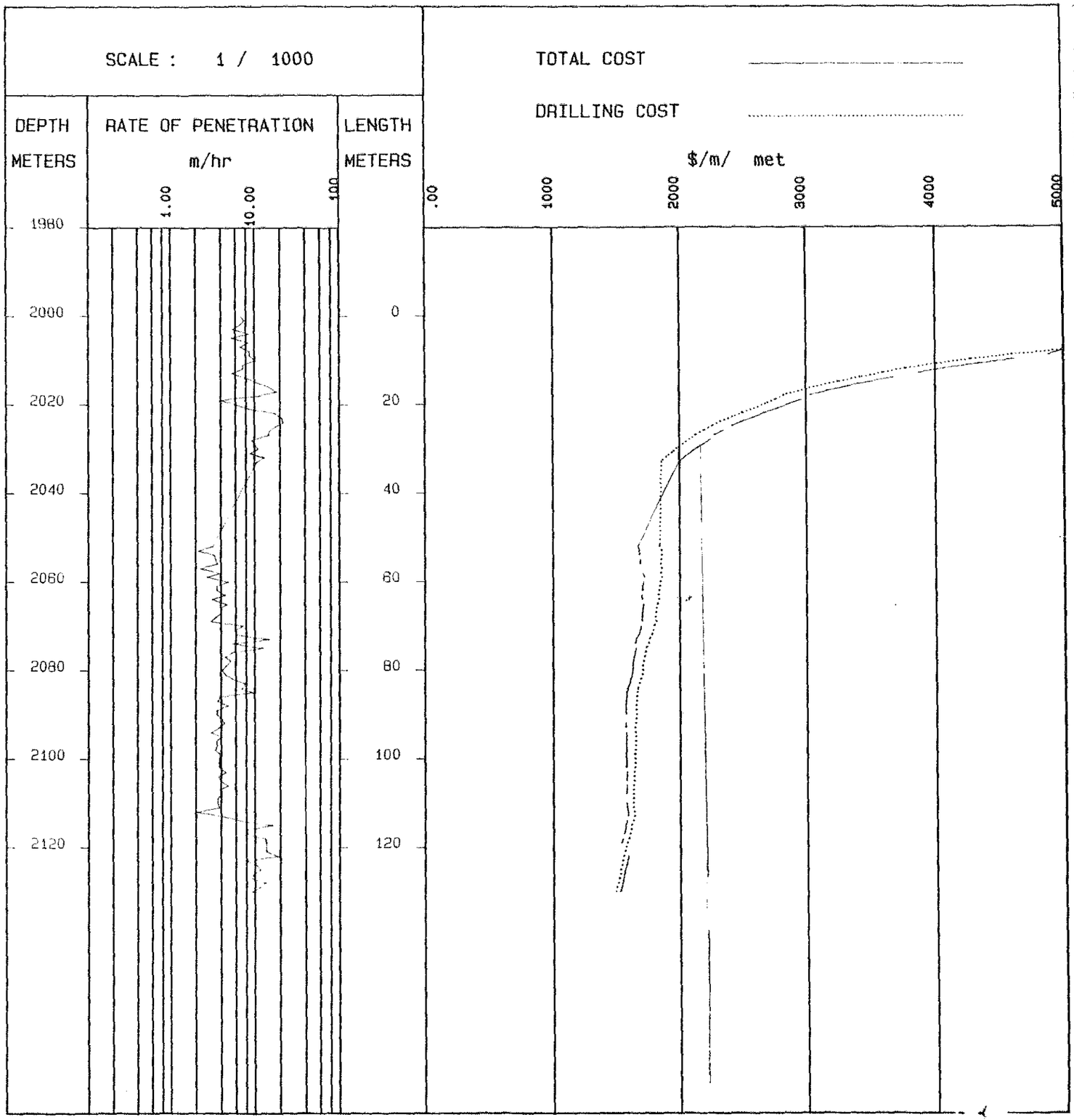
BIT COST REPORT

17/ 6/ 82 HAMMERHEAD #1

BIT TYPE	:	INSERT	
BIT IDENTITY	:	HTC J22	
BIT SIZE	:	8.50	INCHES
BIT COST	:	8000	$/m
RIG COST	:	5833	$/m (PER HOUR)
TRIP TIME	:	6.0	HRS
STARTED AT	:	1997.9	met
ENDED AT	:	2131.0	met
TOTAL BIT TIME	:	33.2	HRS
BOTTOM TIME	:	27.2	HRS

MINIMUM DRILLING COST

- HOUR	:	26.5	HRS
- DEPTH	:	2130.1	met
- COST	:	1493.0	$/m/ met
FINAL TOTAL COST	:	1525.6	$/m/ met



Geoservices overseas S.A.

ZERO

REAL TIME PRINT - OUT

(including Bit Reports

and Daily Hydraulic Reports)

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

17/ 4/82 — HAMMERHEAD #1

BIT #1 RUN #1 SEQ NBR: 0

STARTING DEPTH 143.00 METERS

BIT DATA — SIZE 36.00
TOOTH REED BIT &
CLES 28 28 28 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	5	9.22	4.28	5.00	29.02
2	DRILL COLLAR	1	56.60	2.81	7.75	207.00
3	DRILL COLLAR	1	33.24	3.00	9.50	322.90

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	17.37	.00	143.00
OPEN HOLE 1	36.00	143.00	143.00

COST DATA — BIT COST 0 $ — RIG COST 5033 $/HR
TRIP TIME 2.00 HRS

WEIGHTS — HOOK LOAD OFF BOTTOM 60.6 TONS
STRING WEIGHT IN AIR 23.8 TONS

VOLUMES — ANNULUS 18.0 M3 — IN PIPES .9 M3

DEVIATION .0 DEG .000 M / 100 M

HYDRAULICS — NOMINAL ANNULUS PRESSURE LOSSES AT 1600 L/MN : 392 KPA

BIT WEAR — TYPE EXPONENT .6
EXPECTED: RUN LENGTH 57 METERS TEETH WEAR 0 /8TH

GEOSERVICES — HAMMERHEAD #1 — DATE : 17/ 4/82

BIT #1 RUN #1 RD BIT . . BIT DIAMETER : 36.00 inch NOZZ 20/20/20 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	VERTCL	LAGGED	DRILLING PARAMETERS ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	DENSITY IN	DENSITY OUT	MUD PARAMETERS TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	tons	rpm	N*m	kPa	l/mn	m3	sg	sg	degC	degC	ohmm	ohmm	unit			sq	sq	sq	met	DHr	$/m
D	3: 0	143.9	143.9	93.0	7.9	-2.1	0	181	4552	3481	101.	1.00	.64	19.2	19.2	.19	-.19	2.0	-.16	.00	.00	2.36	.53	43.9	.11	200
D	5: 3	144.9	144.6	93.0	30.3	1.2	6	181	4582	3383	44.7	1.07	.64	18.3	19.0	.19	.00	2.0	-.20	.00	.00	2.32	.53	1.6	1.66	13659
D	5: 5	146.0	145.5	93.0	38.1	.6	15	181	4582	3400	45.5	1.08	.64	18.4	18.[illegible]	.19	.00	1.0	.07	.00	.00	2.33	.53	2.5	1.69	8472
D	5: 7	147.0	146.6	93.0	46.2	.2	19	181	2426	2754	45.5	1.07	.64	18.4	18.	.19	.00	2.0	.24	.00	.00	2.05	.53	3.6	1.72	5959
D	5:11	148.0	147.6	93.0	9.9	-.5	22	181	1887	2258	45.3	1.08	.64	18.6	18.[illegible]	.19	.00	2.0	.00	.00	.00	1.[illegible]	.53	4.6	1.79	4817
D	5:13	148.9	148.5	93.0	20.6	.1	20	181	1887	2258	45.3	1.07	.64	18.6	18.8	.19	.00	1.0	.00	.00	.00	[illegible]	.53	5.5	1.83	4807
D	5:25	150.0	149.6	93.0	5.9	-.1	23	181	2276	2466	41.1	1.03	.64	18.5	18.7	.19	.00	2.0	.52	.00	.00	2.[illegible]	.53	6.6	2.03	3488
D	6:12	151.0	150.5	93.0	6.4	.1	29	181	5420	3682	43.5	1.03	.64	18.3	18.[illegible]	.19	.00	3.0	.46	.00	.00	2.45	.53	7.5	2.18	3195
D	6:15	152.0	151.6	93.0	19.7	.7	28	181	5420	3682	40.2	1.04	.64	18.2	18.[illegible]	.19	.00	4.0	.34	.00	.00	2.45	.53	8.6	2.22	2854
D	6:19	153.0	152.6	93.0	11.2	1.4	29	181	5390	3665	53.6	1.07	.64	18.4	18.[illegible]	.19	.00	3.0	.49	.00	.00	2.46	.53	9.6	2.29	2606
D	6:22	154.0	153.6	93.0	14.5	1.2	29	181	5540	3758	51.8	1.06	.64	18.2	18.[illegible]	.19	.00	3.0	.51	.00	.00	2.[illegible]	.53	10.6	2.34	2379
D	6:26	154.9	154.6	93.0	15.7	1.7	29	181	5660	3793	50.4	1.06	.64	18.4	18.[illegible]	.19	.00	3.0	.48	.00	.00	2.[illegible]	.53	11.6	2.41	2216
D	6:34	156.0	155.5	93.0	12.7	1.2	29	181	5660	3776	47.8	1.07	.64	18.3	18.[illegible]	.19	.00	3.0	.54	.00	.00	2.51	.53	12.5	2.54	2070
D	6:38	157.0	156.5	93.0	11.6	1.4	28	181	5660	3776	46.8	1.07	.64	18.3	18.[illegible]	.19	.00	4.0	.54	.00	.00	2.50	.53	13.5	2.61	1977
D	6:43	158.0	157.6	93.0	14.8	.2	21	362	5690	3793	46.1	1.07	.64	18.4	18.2	.19	.00	4.0	.49	.00	.00	2.51	.53	14.6	2.68	1859
D	6:51	159.0	158.6	93.0	14.9	.4	36	181	5630	3756	44.3	1.07	.64	18.3	18.2	.19	.00	4.0	.53	.00	.00	2.47	.53	15.6	2.82	1779
D	7: 9	160.0	159.5	93.0	10.2	1.6	14	181	5540	3729	50.6	1.07	.64	18.3	18.[illegible]	.19	.00	1.0	.49	.00	.00	2.44	.53	16.5	2.87	1717
D	7:12	161.0	160.6	93.0	13.3	1.2	24	181	5510	3717	49.2	1.07	.64	18.2	18.[illegible]	.19	.00	1.0	.44	.00	.00	2.43	.53	17.6	2.93	1627
D	7:15	161.9	161.7	93.0	21.6	1.7	24	181	5510	3717	48.2	1.07	.64	18.2	18.[illegible]	.19	.00	1.0	.48	.00	.00	2.42	.53	18.7	2.98	1550
D	7:19	163.0	163.0	93.0	14.9	1.8	22	181	5510	3736	47.4	1.07	.64	18.3	18.[illegible]	.19	.00	1.0	.51	.00	.00	2.42	.53	20.0	3.05	1471
D	7:22	164.0	163.6	93.0	23.9	1.3	22	181	5510	3704	47.0	1.07	.64	18.2	18.[illegible]	.19	.00	1.0	.41	.00	.00	2.39	.53	20.6	3.09	1436
D	7:25	164.9	164.6	93.0	24.3	.4	40	181	5400	3717	46.5	1.07	.64	18.3	18.[illegible]	.19	.00	1.0	.40	.00	.00	2.39	.53	21.6	3.15	1387
D	7:31	166.0	166.0	93.0	12.2	.3	39	181	5450	3699	46.5	1.07	.64	18.3	18.[illegible]	.19	.00	1.0	.50	.00	.00	2.38	.53	23.0	3.23	1327
D	7:34	167.0	166.5	93.0	11.2	1.0	34	181	5480	3707	46.5	1.07	.64	18.4	18.[illegible]	.19	.00	1.0	.49	.00	.00	2.38	.53	23.5	3.30	1310
D	7:42	167.9	167.6	93.0	4.3	.1	41	181	5480	3724	46.5	1.07	.64	18.3	18.[illegible]	.19	.00	2.0	.64	.00	.00	2.39	.53	24.6	3.43	1285
D	7:56	169.2	169.0	93.0	5.3	-1.4	45	181	5779	3793	48.4	1.07	.64	18.5	18.[illegible]	.19	.00	2.0	-.00	.00	.00	2.42	.53	26.0	3.56	1244
D	7:57	170.0	170.0	93.0	66.8	1.2	36	181	5809	3795	46.1	1.07	.64	18.5	18.[illegible]	.19	.00	2.0	.26	.00	.00	2.41	.53	27.0	3.57	1203
D	7:58	171.0	170.6	93.0	37.2	-.6	44	181	5749	3793	44.7	1.07	.64	18.5	18.[illegible]	.19	.00	2.0	.38	.00	.00	2.40	.53	27.6	3.60	1180
D	8: 1	171.9	171.6	93.0	22.3	-.1	26	181	5809	3795	44.1	1.07	.64	18.3	18.[illegible]	.19	.00	2.0	.00	.00	.00	2.39	.53	28.6	3.64	1148
D	8:17	172.9	172.5	93.0	16.7	1.4	32	181	5839	3813	39.7	1.07	.64	18.4	18.2	.19	.00	2.0	.00	.00	.00	2.40	.53	29.5	3.98	1121
D	8:20	174.0	173.6	93.0	16.7	.8	33	181	5809	3810	38.7	1.07	.64	18.4	18.2	.19	.00	2.0	.47	.00	.00	2.39	.53	30.6	3.96	1133
D	8:24	174.9	174.6	93.0	12.7	-.5	41	181	5809	3793	37.7	1.07	.64	18.3	18.2	.19	.00	2.0	.50	.00	.00	2.37	.53	31.6	4.03	1109
D	8:28	175.9	175.5	93.0	12.1	1.2	37	181	5809	3813	37.3	1.07	.64	18.3	18.2	.19	.00	2.0	.46	.00	.00	2.38	.53	32.5	4.08	1088
D	8:30	177.0	176.5	93.0	26.7	.6	40	181	5809	3830	37.3	1.07	.64	18.4	18.2	.19	.00	2.0	.41	.00	.00	2.37	.53	33.5	4.12	1063
D	8:34	177.9	177.6	93.0	15.7	1.2	37	181	5809	3793	37.7	1.07	.64	18.3	18.2	.19	.00	2.0	.53	.00	.00	2.35	.54	34.6	4.18	1039
D	8:59	178.9	178.5	93.0	26.5	-.2	40	181	5151	3574	46.5	1.07	.64	18.3	18.3	.19	.00	3.0	.45	.00	.00	2.20	.54	35.5	4.22	1018
D	9: 3	180.0	179.5	93.0	38.1	.7	35	181	5151	3574	46.3	1.07	.64	18.5	18.3	.19	.00	3.0	.34	.00	.00	2.19	.54	36.5	4.29	1000
D	9: 8	180.9	180.6	93.0	14.1	-.1	42	181	5151	3576	45.7	1.07	.64	18.3	18.2	.19	.00	3.0	.00	.00	.00	2.19	.54	37.6	4.38	983
D	9:14	182.0	182.0	93.0	12.1	.1	42	362	5151	3596	45.7	1.07	.64	18.5	18.2	.19	.00	3.0	.45	.00	.00	2.19	.54	39.0	4.48	970
D	9:19	183.0	182.6	93.0	11.5	.1	45	362	5151	3596	45.7	1.07	.64	18.4	18.2	.19	.00	3.0	.50	.00	.00	2.18	.54	39.6	4.56	962
D	9:22	183.9	183.6	93.0	29.7	1.4	35	181	5180	3576	45.7	1.07	.64	18.3	18.2	.19	.00	3.0	.39	.00	.00	2.17	.54	40.6	4.60	946
D	9:44	185.0	184.5	93.0	11.2	1.4	41	181	5151	3596	46.1	1.07	.64	18.6	18.3	.19	.00	1.0	.56	.00	.00	2.17	.54	41.5	4.97	935
D	9:52	186.0	185.5	93.0	5.2	-.1	44	181	5151	3576	46.3	1.07	.64	18.3	18.3	.19	.00	1.0	.72	.00	.00	2.16	.54	42.5	5.10	969
D	10: 6	188.3	186.6	93.0	13.7	.9	23	181	5180	3559	51.2	1.03	.64	18.3	18.3	.19	.00	1.0	.55	.00	.00	2.12	.54	43.6	5.14	955
D	10:13	189.1	189.1	93.0	5.9	1.2	43	****	5630	3757	43.9	1.02	.64	18.5	18.3	.19	.00	1.0	.78	.00	.00	2.20	.55	46.1	5.26	918
D	10:18	189.9	189.6	93.0	7.6	1.2	42	****	5660	3752	48.6	1.02	.64	18.4	18.3	.19	.00	1.0	.66	.00	.00	2.18	.55	46.6	5.33	916
D	10:27	190.9	190.5	93.0	16.7	1.2	48	0	5690	3737	49.6	1.03	.64	18.5	18.3	.19	.00	1.0	.59	.00	.00	2.19	.55	47.5	5.50	904
D	10:33	192.0	191.5	95.0	14.9	-.1	53	0	5690	3757	49.2	1.03	.64	18.3	.0	.19	.00	1.0	.57	.00	.00	2.19	.55	48.5	5.59	906
D	10:58	192.9	192.6	.0	2.1	.5	34	0	5720	3757	48.6	1.03	.64	18.5	.0	.19	.00	1.0	.78	.00	.00	2.19	.55	49.6	5.85	919

GEOSERVICES — HAMMERHEAD #1 — DATE : 17/ 4/82

ON-LINE TDC

BIT #1 RUN #1 RD BIT 8 H BIT DIAMETER : 36.00 inch NOZZ 20/20/20 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRA	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	tons	rpm	N*m	kPa	l/mn	m3	sg		degC		ohmm		unit		sg	sg	sg		met	DHr	$/m
D	10:54	193.9	193.5	.0	14.9	-.1	38	0	5720	3737	40.2	1.03	.00	18.5	.0	.19	.00		.51	.00	.00	2.17	.55	50.5	5.91	918
D	10:59	195.0	194.6	.0	7.4	.5	39	0	5720	3737	47.6	1.03	.00	18.3	.0	.19	.00		.63	.00	.00	2.16	.55	51.6	6.00	904
D	11: 3	195.9	195.6	.0	30.9	.6	39	0	5749	3747	47.4	1.03	.00	18.6	.0	.19	.00	.0	.43	.00	.00	2.16	.55	52.6	6.05	890
D	11:12	197.0	197.0	.0	8.9	.2	39	0	5720	3770	47.4	1.03	.00	18.5	.0	.19	.00	1.0	.60	.00	.00	2.18	.56	54.0	6.21	887
D	11:27	198.0	197.6	.0	4.5	-.6	46	0	4911	3478	48.0	1.02	.00	18.4	.0	.19	.00	1.0	.60	.00	.00	1.99	.56	54.6	6.37	891
D	11:33	198.9	198.6	.0	7.4	-.3	45	0	5390	3576	50.4	1.01	.00	18.6	.0	.19	.00	1.0	-.00	.00	.00	2.03	.56	55.6	6.47	886
D	11:36	200.0	199.5	.0	22.3	.5	44	101	5390	3646	48.6	1.01	.00	18.6	.0	.19	.00	1.0	.39	.00	.00	2.06	.56	56.5	6.52	877
D	11:40	200.9	200.6	.0	15.0	.4	44	101	5420	3628	44.1	1.00	.00	18.4	.0	.19	.00	1.0	.54	.00	.00	2.04	.56	57.6	6.58	867
D	11:44	202.0	201.5	.0	16.0	.2	44	101	5420	3646	41.9	.99	.00	18.5	.0	.19	.00	2.0	.48	.00	.00	2.03	.56	58.5	6.65	859

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

17/ 4/82 TIME 12:12 HAMMERHEAD #1

DEPTH OF EXECUTION 201.99 METERS
FLOW RATE 3500 L/MN POWER LAW

MUD DATA	WEIGHT	1.07 SG
	PV	3 CPS
	YP	.10 LB/FT2
	GEL	.10 LB/100 FT2
	N	1.0000
	K	.0059 LB/100 FT2

HOLES VOLUMES	WITH PIPES	57.42 M3
	WITHOUT PIPES	60.60 M3
	ANNULAR	55.93 M3
	INSIDE PIPES	1.49 M3

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						704	55				
DR.STRING	.00	119.86	4.28	5.00		306	24				
DR.STRING	119.86	176.54	2.81	7.75		1004	85				
DR.STRING	176.54	209.78	3.00	9.50		464	36				
BIT						1487	116	M/S		50.2	
ANNULUS	201.99	168.75		9.50	36.00	0	0	TU	430.7	5.7	-1.4
ANNULUS	168.75	143.00		7.75	36.00	0	0	TU	414.1	5.6	-1.5
ANNULUS	143.00	112.07		7.75	17.37	0	0	TU	237.8	28.6	21.5
ANNULUS	112.07	-.00		5.00	17.37	1	0	TU	211.7	25.0	17.9
TOTAL						4046	317				

ANNULAR PRESSURE LOSSES 1 KPA

EQUIV.CIRCULATING DENSITY 1.07 SG
MAX DEPTH 2668.14

MUD LAG TIMES	S -) B	.43 MN
	B -) S	15.98 MN

CUTTINGS DATA	SIZE	.20 CM
	DENSITY	2.40 SG
	LAG TIME	-33.4 MN
	MAX SLIP VELOCITY	7.11 M/MN

BIT DATA	SIZE	36.00 INCH
	NOZZLES	28 28 28 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	1487 KPA
	H.H.P RATIO	36.76 %
	BIT H.H.P	.114
	BIT VELOCITY	50.16 M/S

ON-LINE TDC
GEOSERVICES BIT REPORT

* 17/ 4/82 HAMMERHEAD #1

*BIT HEADING :BIT #1 RUN #1
*BIT TYPE :TOOTH
*BIT IDENTITY :RD BIT & H
*BIT SIZE : 36.00 INCH
*BIT COST : . $ RIG COST/HR: 5833.
*NOZZLES : 28 28 28 /32NDS @ 95 % EFFICIENCY
*DEPTH IN : 143.48 METERS 17/ 4/82
*DEPTH OUT : 201.99 METERS 17/ 4/82
*METRAGE : 58.51 METERS
*TOTAL REVOLUTIONS : 10
*DRILLING TIME: 6:40 HR AVERAGE ROP: 8.78 M/HR
*TIME IN HOLE : 8:54 HR AVERAGE ROP: 6.57 M/HR
*TRIP TIME : 2: 0 HR
*DRILLING COST STANDARD : 1087.5 $/MET
*DRILLING COST ON BOTTOM : 863.5 $/MET
*DRILLING COST MINIMUM : 271.5 $/MET

* AVERAGE OVER THE RUN		AVERAGE HYDRAULICS	
*WEIGHT ON BIT	: .55 TONS	NOZZLES SPEED	: 49.98 M/S
*ROTATION	: 31.86 RPM	PRESSURE DROP	: 1477 KPA
*FLOW RATE	:3487.57 L/MN	HYDRAULIC POWER:	115.14 H.P
*STAND PIPE PRESSURE:	5065 KPA		

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

19/ 5:82 — HAMMERHEAD #1

BIT #3 RUN #1 SEQ NBR: 0

STARTING DEPTH 203.00 METERS

BIT DATA SIZE 12.25
TOOTH RD FP 12
NOZZLES 13 13 13 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	12	9.20	4.20	5.00	29.02
2	DRILL COLLAR	1	56.68	2.81	7.75	207.80
3	DRILL COLLAR	1	30.40	3.00	9.50	322.90

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	28.00	143.00	194.00
OPEN HOLE 1	12.25	194.00	203.00

COST DATA BIT COST 10000 $ RIG COST 5033 $/HR
TRIP TIME 2.00 HRS

WEIGHTS HOOK LOAD OFF BOTTOM 65.0 TONS
STRING WEIGHT IN AIR 24.8 TONS

VOLUMES ANNULUS 36.7 M3 IN PIPES 1.4 M3

DEVIATION .0 DEG .000 M / 100 M

HYDRAULICS NOMINAL ANNULUS PRESSURE LOSSES AT 1600 L/MN : 392 KPA

BIT WEAR TYPE EXPONENT .6
EXPECTED: RUN LENGTH 347 METERS TEETH WEAR 0 /8TH

GEOSERVICES — HAMMERHEAD #1 — DATE : 19/ 5/82

ON-LINE TDC

BIT #3 RUN #3 RD FP 12 — BIT DIAMETER : 12.25 inch — NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 6 GEL = 6

		DEPTHS				DRILLING PARAMETERS							MUD PARAMETERS						GAS	OVERPRESSURE SURVEY						ACCUMULATED		
	TIME	MEASURED	VERTCL	LAGGED	ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT		DCS	NORM	PF	ECD	FRAC	METER	TIME	
	hr:mn	met	met	met	m/hr	tons	rpm	Nm	kPa	l/mn	m3	sg		degC		ohmm		unit			a	sg	sg	met	DHr	$/m
D	5:46	256.3	254.8	.0	197.	.8	93	1446	19135	2528	97.9	1.09	1.15	16.5	.0	.19	.00	-13.	.33	.00	.00	1.47	.00	53.3	.84	411
D	5:46	257.0	255.1	.0	82.8	.4	94	1446	19105	2525	97.5	1.10	1.15	16.6	.0	.19	.00	-13.	.49	.00	.00	1.54	.00	53.6	.85	410
D	5:47	257.9	256.2	.0	158.	.4	94	1446	19105	2508	97.3	1.09	1.14	16.6	19.3	.19	.21	-13.	.37	.00	.00	1.43	.00	54.7	.86	402
D	5:47	258.9	257.1	.0	133.	.0	95	1446	19105	2544	96.9	1.23	1.14	16.7	19.4	.19	.21	-12.	.36	.00	.00	1.62	.00	55.6	.87	396
D	5:48	259.8	258.3	.0	146.	.8	95	1446	19135	2508	96.5	1.09	1.14	16.7	19.4	.19	.21	-12.	.38	.00	.00	1.46	.00	56.8	.87	389
D	5:48	260.5	259.0	.0	121.	.2	96	1446	6678	1637	96.3	1.03	1.15	16.7	19.4	.19	.20	-12.	.39	.00	.00	1.46	.00	57.5	.88	385
D	6: 4	261.8	260.2	.0	98.6	.4	89	1446	19235	2485	106.	1.02	1.10	17.0	19.1	.19	.21	-11.	-.00	.00	.00	1.39	.00	58.7	.10	379
D	6: 4	263.0	261.4	.0	158.	1.7	86	1627	19255	2539	105.	1.03	1.14	17.1	19.1	.19	.21	-11.	.34	.00	.00	1.52	.00	60.2	.11	371
D	6: 5	263.8	262.2	.0	139.	3.2	87	1627	19205	2532	105.	1.04	1.14	17.2	19.1	.19	.20	-11.	.51	.00	.00	1.49	.00	60.7	.12	368
D	6: 5	264.9	263.1	.0	130.	2.2	85	1627	19205	2517	105.	1.08	1.14	17.1	19.2	.19	.20	-11.	.46	.00	.00	1.50	.00	61.6	.12	363
D	6: 5	265.8	264.4	.0	220.	1.9	88	1627	19205	2502	104.	1.19	1.14	17.1	19.2	.19	.20	-11.		.00	.00	1.52	.00	62.8	.13	356
D	6: 6	267.2	265.6	.0	324.	2.8	87	1627	19205	2539	104.	1.05	1.14	17.1	19.3	.19	.21	-11.	.29	.00	.00	1.46	.00	64.1	.13	350
D	6: 6	268.0	266.0	.0	253.	2.9	87	1627	19205	2539	104.	1.03	1.13	17.2	19.3	.19	.21	-11.	.38	.00	.00	1.42	.00	64.5	.14	348
D	6: 6	268.8	267.0	.0	131.	2.4	88	1627	19205	2502	104.	1.10	1.14	17.1	19.3	.19	.21	-11.	.50	.00	.00	1.40	.00	65.5	.14	343
D	6: 7	269.7	268.2	.0	74.1	.7	50	1085	19255	2520	103.	1.10	1.14	17.1	19.4	.19	.21	-11.	.41	.00	.00	1.50	.00	66.7	.15	338
D	6:14	270.7	269.0	.0	130.	.2	85	1446	17338	2412	107.	1.29	1.16	17.4	19.6	.19	.22	-9.9	-.00	.00	.00	1.37	.00	67.5	1.25	429
D	6:15	271.9	270.2	.0	206.	2.3	81	1088	17396	2395	106.	1.10	1.16	17.4	19.6	.19	.22	-9.9	.34	.00	.00	1.44	.00	68.6	1.26	422
D	6:15	272.9	271.1	.0	110.	2.8	82	1627	17360	2395	106.	1.03	1.16	17.4	19.6	.19	.21	-9.9	.52	.00	.00	1.36	.00	69.6	1.26	417
D	6:15	274.1	272.1	.0	192.	2.5	83	1627	17360	2410	105.	1.02	1.15	17.5	19.4	.19	.21	-11.	.40	.00	.00	1.36	.00	70.6	1.27	411
D	6:16	275.0	273.1	.0	74.7	3.2	81	1627	17360	2393	105.	1.26	1.15	17.4	19.4	.19	.21	-11.	.20	.00	.00	1.38	.00	72.1	1.27	403
D	6:16	276.1	274.2	.0	160.	2.8	81	1088	17360	2393	105.	1.13	1.15	17.4	19.3	.19	.21	-11.	.39	.00	.00	1.45	.00	73.1	1.28	398
D	6:16	277.2	275.3	.0	195.	3.4	82	1627	17330	2410	104.	1.03	1.15	17.6	19.3	.19	.21	-11.	.44	.00	.00	1.37	.00	74.2	1.28	393
D	6:17	277.9	276.1	.0	206.	3.7	81	1627	17330	2395	104.	1.03	1.14	17.5	19.3	.19	.21	-11.	.43	.00	.00	1.35	.00	74.6	1.29	391
D	6:17	278.7	277.2	.0	138.	3.6	81	1085	17129	2393	104.	1.02	1.15	17.6	19.2	.19	.21	-11.	.53	.00	.00	1.35	.00	75.7	1.30	386
D	6:24	280.1	278.4	.0	154.	1.4	89	1088	16580	2339	106.	1.04	1.14	17.7	20.6	.19	.33	-1.0	.31	.00	.00	1.37	.00	76.9	1.32	382
D	6:24	281.2	279.5	.0	204.	2.9	88	1088	16470	2339	106.	1.02	1.13	17.8	20.6	.19	.33	-1.0	.41	.00	.00	1.33	.00	78.0	1.32	377
D	6:24	281.9	280.2	.0	185.	4.4	86	1989	16470	2358	105.	1.02	1.13	17.7	20.6	.19	.32	-1.0	.49	.00	.00	1.33	.00	79.1	1.33	372
D	6:24	282.9	281.3	.0	199.	3.2	87	1088	16470	2358	105.	1.52	1.13	17.8	20.5	.19	.32	-1.0	.41	.00	.00	1.40	.00	79.8	1.33	369
D	6:25	284.0	282.2	.0	178.	2.6	87	1088	16440	2350	105.	1.17	1.12	17.8	20.5	.19	.32	-1.0	.38	.00	.00	1.40	.00	81.0	1.34	364
D	6:25	284.9	283.3	.0	199.	3.4	87	1088	16470	2339	104.	1.04	1.12	17.8	20.4	.19	.31	-1.0	.42	.00	.00	1.37	.00	81.8	1.34	361
D	6:25	286.0	284.5	.0	195.	4.3	87	1989	16470	2341	104.	1.03	1.11	17.8	20.3	.19	.31	-1.0	.47	.00	.00	1.33	.00	83.0	1.35	356
D	6:26	287.0	285.3	.0	146.	4.3	87	1989	16440	2350	104.	1.20	1.11	17.7	20.3	.19	.31	-1.0	.54	.00	.00	1.33	.00	83.8	1.35	353
D	6:26	287.9	286.3	.0	161.	3.7	86	1088	16410	2358	103.	1.13	1.11	17.8	20.1	.20	.31	-1.0	.39	.00	.00	1.32	.00	84.8	1.36	349
D	6:27	288.5	287.1	.0	60.9	.0	38	1085	15961	2341	103.	1.10	1.10	17.8	19.9	.19	.30	-1.0	.53	.00	.00	1.46	.00	85.5	1.37	347
D	6:34	290.0	288.1	.0	142.	1.0	85	1627	17039	2376	105.	1.03	1.16	18.1	19.7	.20	.23	-1.0	.48	.00	.00	1.34	.00	86.6	1.39	344
D	6:34	291.0	289.4	.0	160.	1.3	86	1627	17069	2395	104.	1.13	1.15	18.0	19.6	.20	.23	-.0	.28	.00	.00	1.33	.00	87.9	1.40	339
D	6:35	292.0	290.1	.0	203.	3.2	83	1088	17069	2395	104.	1.03	1.16	18.0	19.6	.20	.23	-.0	.39	.00	.00	1.36	.00	88.6	1.40	337
D	6:35	293.7	291.1	290.0	213.	3.1	84	1088	17069	2376	103.	1.02	1.15	18.1	19.6	.20	.23	-.0	.46	.00	.00	1.33	.00	90.7	1.41	329
D	6:36	295.0	293.5	292.0	130.	3.0	84	1627	17009	2376	103.	1.12	1.14	18.0	19.6	.20	.22	-1.0	.47	.00	.00	1.34	.00	92.0	1.42	325
D	6:36	295.9	294.0	293.0	133.	3.2	84	1627	17039	2376	102.	1.03	1.14	18.0	19.6	.20	.22	-1.0	.48	.00	.00	1.35	.00	92.5	1.42	324
D	6:36	296.7	295.1	294.0	183.	2.8	85	1446	16979	2412	102.	1.02	1.14	18.0	19.6	.20	.22	-1.0	.56	.00	.00	1.33	.00	93.6	1.43	321
D	6:38	297.6	296.1	295.0	65.7	.9	89	984	16739	2393	101.	1.02	1.14	18.1	19.6	.20	.21	-1.0	.58	.00	.00	1.32	.00	94.6	1.45	318
D	6:44	298.6	297.1	296.0	147.	2.3	84	1627	17009	2388	103.	1.02	1.16	18.3	20.1	.20	.22	1.0	.47	.00	.00	1.33	.00	95.6	1.47	316
D	6:45	300.1	298.0	297.0	143.	1.6	84	1627	16979	2395	103.	1.22	1.16	18.3	20.0	.20	.23	1.0	.37	.00	.00	1.40	.65	96.5	1.48	314
D	6:45	301.0	299.5	298.0	206.	1.5	84	1627	16979	2385	103.	1.23	1.16	18.3	19.9	.20	.23	.0	.31	.00	.00	1.34	.65	98.0	1.49	310
D	6:46	301.7	300.0	299.0	132.	1.1	85	1446	17009	2375	102.	1.05	1.15	18.3	19.8	.20	.22	-1.0	.37	.00	.00	1.38	.65	98.5	1.50	308
D	6:46	303.0	301.1	300.0	126.	3.6	84	1088	17039	2393	102.	1.02	1.15	18.3	19.8	.20	.22	-1.0	.55	.00	.00	1.32	.65	99.6	1.50	306
D	6:46	303.8	302.3	301.0	326.	3.6	84	1627	17009	2395	101.	1.02	1.15	18.3	19.8	.20	.22	-1.0	.34	.00	.00	1.32	.65	100.8	1.51	302
D	6:47	305.0	303.1	302.0	195.	2.7	84	1627	17009	2395	101.	1.25	1.14	18.3	19.8	.20	.22	-1.0	.29	.00	.00	1.54	.65	101.6	1.52	300

1.04 1.05 — 1.04

BEGINNING OF WELL
NO TREND SELECTED FOR DCS
PF = 1.03

GEOSERVICES — HAMMERHEAD #1 — DATE : 19/ 5/82

ON-LINE TDC

BIT #3 RUN #8 RD FP 12 — BIT DIAMETER : 12.25 inch — NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	tons	rpm	kNm	kPa	l/mn	m3	sg		degC		ohmm		pit		sg	sg	sg	met	Hr	$/m
D	6:47	305.7	304.1	288.0	231.	2.3	83	1805	6049	2393	101.	1.03	1.13	18.3	19.8	.20	.22	-2.0	.36	.00	.00	1.34	.65	102.6	1.52	298
D	7: 2	306.8	305.1	290.0	3.5	.8	80	1446	17428	2412	107.	1.03	1.16	18.6	20.6	.20	.23	1.0	-.00	.00	.00	1.33	.65	103.6	1.60	304
D	7: 4	307.7	306.2	290.0	21.0	-.5	81	1265	17338	2412	105.	1.02	1	18.6	20.1	.20	.22	.0	-.00	.00	.00	1.32	.65	104.7	1.72	303
D	7: 6	308.5	307.0	290.0	33.5	-1.4	81	1265	17368	2410	104.	1.12	1.14	18.6	20.1	.20	.21	.0	.00	.00	.00	1.50	.65	105.5	1.75	302
D	7: 9	309.5	308.0	300.0	14.4	-.1	82	1265	17338	2412	103.	1.03	1.18	18.7	20.7	.20	.23	.0	-.00	.00	.00	1.32	.65	106.5	1.80	302
D	7:12	310.5	309.0	300.0	22.2	.1	81	1446	17368	2412	103.	1.02	1.17	18.8	20.5	.20	.22	1.0	-.00	.00	.00	1.32	.65	107.5	1.85	302
D	7:16	311.6	310.1	300.0	15.9	-.8	83	1265	17398	2412	102.	1.36	1.13	18.9	21.1	.20	.31	1.0	-.00	.00	.00	1.66	.66	108.6	1.91	302
D	7:19	312.5	311.0	300.0	22.2	-1.0	82	1265	17368	2393	103.	1.02	1.13	19.1	20.3	.20	.23	1.0	-.00	.00	.00	1.31	.66	109.5	1.96	302
D	7:21	314.0	312.1	300.0	48.9	4.6	76	1627	17398	2430	102.	1.07	1.13	19.1	20.6	.21	.22	1.0	.70	.00	.00	1.41	.66	110.6	1.99	301
D	7:22	314.7	313.2	300.0	63.6	3.2	77	1627	17398	2393	102.	1.03	1.14	19.1	20.7	.21	.22	1.0	.65	.00	.00	1.32	.66	111.7	2.00	298

ON-LINE TDC
GEOSERVICES HYDRAULIC REPORT

* 19/ 5/82 TIME 7:35 HAMMERHEAD #1

* DEPTH OF EXECUTION 315.30 METERS
* FLOW RATE 2400 L/MN POWER LAW

MUD DATA	WEIGHT	1.05	SG
————	PV	3	CPS
	YP	.10	LB/FT2
	GEL	.10	LB/100 FT2
	N	1.0000	
	K	.0059	LB/100 FT2
HOLES VOLUMES	WITH PIPES	46.30	M3
————	WITHOUT PIPES	49.01	M3
	ANNULAR	43.81	M3
	INSIDE PIPES	2.50	M3

	FROM	TO	PIPE ID	PIPE OD	HOLE DIAM	P.LOSSES	H.P	TYPE	CRITICAL FLOW	MUD VELOCITY	CUTTINGS VELOCITY
	METERS		INCH	INCH	INCH	KPA			L/MN	M/MN	M/MN
SURF.EQPT						352	19				
DR.STRING	.00	230.00	4.28	5.00		293	16				
DR.STRING	230.00	286.68	2.81	7.75		542	29				
DR.STRING	286.68	317.00	3.00	9.50		212	11				
BIT						14790	793	M/S		159.5	
ANNULUS	315.30	284.90		9.50	12.25	8	0	TU	209.5	79.2	72.0
ANNULUS	284.90	228.22		7.75	12.25	4	0	TU	192.7	52.6	45.4
ANNULUS	228.22	194.00		5.00	12.25	1	0	TU	166.2	37.9	30.7
ANNULUS	194.00	143.00		5.00	28.00	0	0	TU	317.9	6.2	-1.0
ANNULUS	143.00	.00		5.00	16.75	0	0	TU	209.5	10.5	11.3
TOTAL						16202	869				

ANNULAR PRESSURE LOSSES 13 KPA

EQUIV.CIRCULATING DENSITY 1.05 SG
MAX DEPTH 3093.60

MUD LAG TIMES	S -) B	1.04 MN
————	B -) S	18.25 MN

CUTTINGS DATA	SIZE	.20 CM
————	DENSITY	2.40 SG
	LAG TIME	-37.0 MN
	MAX SLIP VELOCITY	7.21 M/MN

BIT DATA	SIZE	12.25 INCH
————	NOZZLES	13 13 13 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	14790 KPA
	H.H.P RATIO	91.28 %
	BIT H.H.P	6.732
	BIT VELOCITY	159.55 M/S

ON-LINE TDC
GEOSERVICES BIT REPORT

19/ 5/82 HAMMERHEAD #1

#BIT HEADING :BIT #3 RUN #3
#BIT TYPE :TOOTH
#BIT IDENTITY :RD FP 12

#BIT SIZE : 12.25 INCH
#BIT COST : 10000. $ RIG COST/HR: 5833.

#NOZZLES : 13 13 13 /32NDS @ 95 % EFFICIENCY

#DEPTH IN : 283.24 METERS 19/ 5/82
#DEPTH OUT : 315.30 METERS 19/ 5/82
#METRAGE : 112.06 METERS
#TOTAL REVOLUTIONS : 4

#DRILLING TIME: 2: 1 HR AVERAGE ROP: 55.66 M/HR
#TIME IN HOLE : 1:45 HR AVERAGE ROP: 64.25 M/HR
#TRIP TIME : 2: 0 HR

#DRILLING COST STANDARD : 284.1 $/MET
#DRILLING COST ON BOTTOM : 298.1 $/MET
#DRILLING COST MINIMUM : 297.7 $/MET

AVERAGE OVER THE RUN AVERAGE HYDRAULICS
#WEIGHT ON BIT : 1.53 TONS NOZZLES SPEED : 157.46 M/S
#ROTATION : 81.88 RPM PRESSURE DROP : 14404 KPA
#FLOW RATE :2368.55 L/MN HYDRAULIC POWER: 762.64 H.P
#STAND PIPE PRESSURE: 17203 KPA

GEOSERVICES — HAMMERHEAD #1 — DATE : 19/ 5/82

ON-LINE TDC

BIT #3 RUN #3 RD FP 12 BIT DIAMETER : 12.25 inch NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 8 GEL = 8

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	WORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST	
	Hr:mn	met	met	met	m/hr	tons	rpm	Nmm	kPa	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m	
D	7:39	317.5	315.6	300.0	120.	-6.8	0	542	11209	1188	105.	1.07	1.19	19.3	20.7	.21	.21	1.0	-.00	.00	.00	9.94	.66	114.1	2.02	293	
D	7:39	326.0	323.8	300.0	2154	-4.0	0	542	14803	1519	106.	1.33	1.19	19.3	20.8	.21	.22	1.0	-.00	.00	.00	1.44	.67	122.3	2.03	274	
D	7:39	327.4	325.6	300.0	939.	-3.6	1	904	16000	1903	106.	1.07	1.14	19.3	20.8	.21	.22	1.0	.00	.00	.00	1.22	.67	124.1	2.03	270	
D	7:40	328.1	326.1	300.0	131.	-2.7	54	1808	16230	2239	105.	1.04	1.14	19.3	21.0	.21	.22	1.0	-.00	.00	.00	1.29	.67	124.6	2.03	269	
D	7:40	329.0	327.2	300.0	195.	-2.7	75	1265	16500	2234	105.	1.10	1.14	19.3	21.0	.21	.22	1.0	.00	.00	.00	1.28	.67	125.7	2.04	267	
D	7:40	329.8	328.2	300.0	137.	-4.1	84	1265	16560	2339	105.	1.21	1.14	19.3	21.0	.21	.22	1.0	-.00	.00	.00	1.64	.67	126.7	2.04	265	
D	7:41	330.6	329.1	300.0	129.	1.0	84	1627	16560	2376	104.	1.04	1.14	19.4	20.9	.21	.22	1.0	-.00	.00	.00	1.32	.67	127.6	2.05	263	
D	7:42	332.2	330.6	300.0	252.	4.6	80	1808	16649	2376	103.	1.06	1.14	19.3	20.8	.21	.22	1.0	.38	.00	.00	1.35	.67	129.1	2.07	261	
D	7:42	332.5	331.0	300.0	60.0	3.2	82	1627	16649	2393	103.	1.03	1.14	19.4	20.8	.21	.22	.0	.68	.00	.00	1.31	.67	129.5	2.08	261	
D	7:44	333.8	332.8	300.0	33.3	2.6	83	1627	16649	2376	102.	1.08	1.15	19.4	20.8	.21	.22	.0	.65	.00	.00	1.35	.67	130.5	2.11	260	
D	7:45	334.9	333.2	300.0	44.2	4.7	82	1989	16620	2359	101.	1.04	1.14	19.5	20.8	.21	.22	.0	.72	.00	.00	1.32	.67	131.6	2.12	259	
D	7:46	336.4	334.3	300.0	96.6	4.5	81	1808	16590	2393	101.	1.03	1.15	19.5	20.8	.21	.22	.0	.62	.00	.00	1.30	.67	132.8	2.13	257	
D	7:46	336.7	335.1	300.0	132.	4.2	80	1808	16590	2356	101.	1.03	1.14	19.5	20.9	.21	.22	.0	.55	.00	.00	1.29	.67	133.6	2.14	256	
D	7:48	337.9	336.1	300.0	28.3	5.9	81	1808	16620	2359	101.	1.25	1.15	19.5	21.1	.21	.22	.0	.85	.00	.00	1.49	.68	134.6	2.17	255	
D	7:49	339.0	337.4	300.0	37.7	5.2	81	1808	16290	2358	100.	1.03	1.15	19.6	21.1	.21	.22	.0	.70	.00	.00	1.29	.68	135.9	2.19	253	
D	8: 1	339.7	338.2	300.0	6.1	3.7	82	1808	17390	2429	99.7	1.08	1.16	19.8	21.1	.21	.23	3.0	.97	.00	.00	1.40	.68	136.7	2.21	253	
D	8: 2	340.7	339.0	300.0	131.	2.4	83	1627	17368	2429	99.7	1.02	1.15	19.8	21.2	.21	.23	3.0	.52	.00	.00	1.38	.68	137.5	2.22	252	
D	8: 4	341.5	340.0	300.0	26.4	3.2	82	1808	17330	2412	99.3	1.26	1.15	19.8	21.6	.21	.23	2.0	.88	.00	.00	1.54	.68	138.5	2.26	251	
D	8:12	342.8	341.0	300.0	55.7	4.8	66	1808	17608	2405	102.	1.05	1.15	19.9	21.6	.21	.23	1.0	.00	.00	.00	1.33	.68	139.5	2.28	251	
D	8:13	343.8	342.1	300.0	80.0	2.4	87	1627	17967	2449	101.	1.04	1.16	20.0	21.5	.21	.23	2.0	.46	.00	.00	1.34	.68	140.6	2.29	249	
D	8:14	344.6	343.0	300.0	139.	5.2	83	1989	17967	2454	101.	1.03	1.15	20.0	21.3	.21	.23	2.0	.58	.00	.00	1.30	.68	141.5	2.31	248	
D	8:15	345.6	344.1	300.0	53.3	4.5	85	1808	17937	2466	99.9	1.04	1.15	20.1	21.2	.21	.23	2.0	.71	.00	.00	1.33	.68	142.6	2.33	247	
D	8:16	346.6	345.1	300.0	66.5	5.4	84	1808	17937	2449	99.5	1.08	1.15	20.1	21.3	.21	.23	2.0	.67	.00	.00	1.40	.68	143.6	2.35	246	
D	8:17	347.5	346.0	300.0	49.7	7.1	81	2531	17967	2466	99.5	1.03	1.14	20.1	21.4	.21	.23	2.0	.83	.00	.00	1.31	.68	144.5	2.36	245	
D	8:18	348.9	347.1	300.0	146.	3.8	84	1989	17937	2458	99.3	1.37	1.14	20.1	21.5	.21	.23	2.0	.40	.00	.00	1.37	.68	145.6	2.37	244	
D	8:19	349.8	348.2	300.0	33.4	5.1	85	1989	17907	2466	99.1	1.03	1.14	20.1	21.8	.21	.22	1.0	.71	.00	.00	1.31	.68	146.7	2.39	243	
D	8:20	350.5	349.1	300.0	99.0	4.6	85	1627	17937	2449	98.9	1.04	1.14	20.1	22.0	.21	.23	1.0	.62	.00	.00	1.32	.68	147.5	2.40	242	
D	8:21	351.5	350.0	300.0	69.0	2.3	88	1627	17877	2466	98.7	1.15	1.15	20.2	22.1	.21	.23	1.0	.59	.00	.00	1.42	.69	148.5	2.43	241	
D	8:31	352.9	351.3	300.0	67.0	6.0	72	2169	17218	2412	99.7	1.10	1.15	20.3	21.7	.21	.23	2.0	.65	.00	.00	1.42	.69	149.8	2.48	241	
D	8:32	353.5	352.0	300.0	66.2	4.5	72	1989	17218	2440	99.3	1.03	1.14	20.3	21.7	.21	.23	2.0	.78	.00	.00	1.30	.69	150.5	2.49	240	
D	8:33	354.8	353.1	300.0	88.7	6.4	72	1989	17188	2412	98.9	1.03	1.14	20.4	21.6	.21	.23	2.0	.65	.00	.00	1.29	.69	151.6	2.51	239	
D	8:34	355.6	354.1	300.0	66.5	4.8	73	1808	17188	2412	98.7	1.19	1.13	20.4	21.8	.21	.22	2.0	.48	.00	.00	1.45	.69	152.6	2.52	238	
D	8:35	356.6	355.1	300.0	69.7	3.4	74	1627	17218	2412	98.3	1.03	1.14	20.3	22.0	.21	.23	1.0	.65	.00	.00	1.29	.69	153.6	2.54	238	
D	8:37	357.8	356.2	300.0	114.	3.9	74	1808	17248	2425	98.3	1.03	1.15	20.4	22.3	.21	.23	1.0	.56	.00	.00	1.29	.69	154.7	2.57	237	
D	8:38	358.5	357.0	300.0	44.7	3.9	72	1808	17248	2442	98.1	1.26	1.16	20.5	22.3	.21	.23	1.0	.64	.00	.00	1.71	.69	155.3	2.59	237	
D	8:40	359.7	358.1	300.0	44.6	2.6	75	1627	17869	2430	97.7	1.18	1.16	20.5	22.5	.21	.23	2.0	.61	.00	.00	1.50	.69	156.6	2.62	236	
D	8:41	360.6	359.1	300.0	46.3	.7	79	1446	17129	2444	97.3	1.06	1.16	20.5	22.5	.21	.23	2.0	.64	.00	.00	1.29	.69	157.6	2.64	235	
D	8:51	361.8	360.3	300.0	60.2	4.8	80	1989	17578	2449	99.3	1.00	1.14	20.7	22.1	.21	.22	2.0	.63	.00	.00	1.38	.69	158.8	2.69	235	
D	8:52	362.5	361.0	300.0	37.5	4.7	76	2712	17600	2441	98.3	1.11	1.14	20.8	22.1	.21	.22	1.0	.75	.00	.00	1.37	.69	159.5	2.72	235	
D	8:53	363.7	362.0	300.0	58.1	2.4	83	2358	17608	2449	97.7	1.03	1.14	20.8	22.2	.21	.23	.0	.78	.00	.00	1.29	.69	160.5	2.73	234	
D	8:54	364.5	363.0	300.0	92.1	1.9	83	2358	17608	2432	97.5	1.04	1.14	20.8	22.2	.21	.22	.0	.53	.00	.00	1.38	.69	161.5	2.75	233	
D	8:55	365.7	364.1	300.0	99.0	2.6	83	2358	17578	2449	97.3	1.04	1.15	20.8	22.5	.21	.23	.0	.54	.00	.00	1.38	.70	162.6	2.77	232	
D	8:58	366.3	365.0	300.0	23.5	5.1	83	2531	17608	2449	97.1	1.03	1.16	20.9	22.6	.21	.23	1.0	.94	.00	.00	1.29	.70	163.5	2.80	232	
D	8:59	367.7	366.2	300.0	85.6	3.6	46	1989	16350	2436	97.1	1.08	1.16	20.8	22.6	.21	.23	2.0	.36	.00	.00	1.67	.70	164.7	2.82	231	
D	9: 0	368.7	367.1	300.0	66.8	2.3	85	1627	16859	2417	97.1	1.10	1.15	20.8	22.6	.21	.23	2.0	.54	.00	.00	1.40	.70	165.6	2.83	231	
D	9:10	369.6	367.7	300.0	57.3	3.3	87	1808	17248	2437	97.7	1.11	1.15	21.1	22.4	.21	.23	2.0	.64	.00	.00	1.37	.70	166.6	2.87	230	
D	9:10	370.6	369.1	300.0	77.6	2.7	84	1627	17218	2437	97.1	1.08	1.14	21.1	22.4	.21	.23	2.0	.47	.00	.00	1.33	.70	167.6	2.88	230	
D	9:12	371.5	370.0	300.0	39.6	.3	88	1446	17218	2435	96.7	1.37	1.14	21.1	22.6	.21	.22	1.0	.60	.00	.00	1.70	.70	168.5	2.90	229	
D	9:14	372.5	371.0	300.0	25.0	3.3	85	1808	17308	2435	95.9	1.17	1.16	21.2	22.9	.21	.23	.0	.78	.00	.00	1.53	.70	169.5	2.94	229	
												1.05	1.06									1.05					

Beginning of well

No trend selected for DCS

PF = 1.03

GEOSERVICES — HAMMERHEAD #1 — DATE : 19/ 5/82

ON-LINE TDC

BIT #3 RUN #3 RD FP 12 BIT DIAMETER : 12.25 inch NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY WORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	tons	rpm	NMm	kPa	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	9:15	373.6	372.8	[illegible]	137.	4.3	86	1627	17248	2435	96.1	1.07	1.18	21.2	22.9	.21	.23	1.0	.49	.00	.00	1.30	.70	170.5	2.96	228
D	9:16	374.7	373.1	[illegible]	103.	1.9	86	1446	17308	2435	95.7	1.14	1.17	21.2	22.9	.21	.23	.0	.51	.00	.00	1.47	.70	171.6	2.97	227
D	9:17	375.8	374.1	[illegible]	44.4	4.9	83	1989	17388	2437	95.9	1.24	1.17	21.2	23.0	.21	.23	1.0	.70	.00	.00	1.49	.70	172.6	2.99	227
D	9:18	376.7	375.2	[illegible]	60.9	4.8	84	1808	17308	2435	95.5	1.22	1.17	21.3	23.0	.21	.24	1.0	.65	.00	.00	1.33	.70	173.7	3.00	226
D	9:19	377.6	376.1	[illegible]	59.8	4.6	82	2169	17248	2435	95.3	1.19	1.16	21.3	23.0	.21	.24	1.0	.69	.00	.00	1.34	.70	174.6	3.02	225
D	9:20	378.6	377.1	[illegible]	40.3	4.8	-0	542	17129	2415	95.3	1.12	1.16	21.3	22.9	.21	.23	2.0	.81	.00	.00	1.37	.71	175.6	3.04	224
D	9:26	379.7	378.2	.0	88.0	3.3	75	1627	18147	2469	97.9	1.35	1.16	21.4	22.8	.21	.23	1.0	.56	.00	.00	1.31	.71	176.7	3.06	224
D	9:28	380.7	378.5	.0	49.9	6.7	87	1808	18326	2503	95.7	1.30	1.14	21.5	22.6	.21	.23	2.0	.96	.00	.00	1.36	.71	177.7	3.10	224
D	9:29	381.6	380.1	.0	53.3	3.4	89	1446	18147	2523	95.3	1.11	1.14	21.5	22.6	.21	.23	2.0	.65	.00	.00	1.44	.71	178.6	3.11	223
D	9:30	382.8	381.0	.0	66.0	4.6	88	1627	18296	2501	94.7	1.16	1.14	21.5	22.8	.21	.23	1.0	.64	.00	.00	1.33	.71	179.5	3.13	222
D	9:32	383.6	382.1	.0	37.9	4.9	87	1627	18296	2523	94.3	1.14	1.14	21.5	22.9	.21	.22	.0	.82	.00	.00	1.40	.71	180.6	3.15	222
D	9:34	384.6	383.1	.0	60.0	5.5	84	1808	18326	2523	94.1	1.11	1.15	21.6	23.2	.21	.23	.0	.68	.00	.00	1.32	.71	181.6	3.18	222
D	9:35	385.7	384.1	.0	66.5	5.9	85	1808	18386	2503	94.3	1.10	1.15	21.6	23.2	.21	.23	.0	.67	.00	.00	1.41	.71	182.6	3.20	221
D	9:36	386.5	385.0	.0	58.2	7.0	84	1909	18356	2503	94.1	1.10	1.15	21.5	23.2	.21	.23	1.0	.71	.00	.00	1.36	.71	183.5	3.22	220
D	9:37	387.6	386.1	.0	55.1	5.2	87	1627	18356	2503	94.1	1.21	1.15	21.6	23.3	.21	.23	1.0	.74	.00	.00	1.32	.71	184.6	3.24	220
D	9:44	388.7	387.1	.0	65.3	4.9	84	1808	18925	2540	97.7	1.22	1.16	21.7	23.4	.21	.24	1.0	.68	.00	.00	1.50	.71	185.6	3.26	219
D	9:46	389.7	388.1	.0	40.3	5.3	86	1627	18925	2540	96.3	1.08	1.16	21.8	22.9	.21	.24	3.0	.76	.00	.00	1.30	.71	186.6	3.28	219
D	9:46	390.8	389.2	.0	55.2	4.2	85	1627	18955	2560	95.3	1.12	1.17	21.8	22.8	.21	.24	3.0	.68	.00	.00	1.41	.71	187.7	3.30	218
												1.05	1.06									1.05				

BEGINNING OF WELL
NO TREND SELECTED FOR DCS
PF = 1.03

GEOSERVICES — HAMMERHEAD #1 — DATE : 19/ 5/82

ON-LINE TDC

BIT #1 RUN #1 RD BIT & H BIT DIAMETER : 36.00 inch NOZZ 20/20/20 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/Hr	tons	rpm	Nm	kPa	l/mn	m3	sg		degC		ohmm		unit		sg	sg	sg		met	DHr	$/m
D	11:43	447.4	446.8		68.6	3.6	88	1989	16440	2319	90.7	1.05	1.17	23.6	24.7	.22	.24	1.0	.55	.00	.00	1.20	.76	244.2	6.71	825
D	11:44	448.2	447.1		52.0	3.8	89	1989	16530	2337	90.7	1.05	1.17	23.8	24.6	.22	.24	1.0	.58	.00	.00	1.20	.76	245.3	6.73	207
D	11:45	449.3	448.8		57.7	3.6	89	1989	16739	2356	90.5	1.11	1.17	23.8	24.5	.22	.24	2.0	.44	.00	.00	1.31	.76	246.2	6.74	207
D	11:46	450.2	449.1		53.3	2.7	91	1989	16799	2356	90.5	1.19	1.17	23.7	24.3	.22	.24	1.0	.51	.00	.00	1.51	.76	247.3	6.76	207
D	11:47	451.2	450.1		39.7	3.6	89	2169	16789	2356	90.5	1.05	1.16	23.8	24.3	.22	.24	1.0	.61	.00	.00	1.28	.76	248.3	6.78	206
D	11:55	452.4	451.8		4.8	7.8	92	1989	16789	2356	90.1	1.13	1.18	23.9	24.8	.22	.24	.0	1.05	.00	.00	1.32	.76	249.2	6.90	208
D	12: 1	453.3	452.8		36.6	4.4	86	1808	17069	2373	90.7	1.09	1.18	23.9	25.1	.22	.24	1.0	.62	.00	.00	1.26	.76	250.2	6.92	208
D	12: 2	454.3	453.8		46.2	5.7	90	1989	17069	2373	90.7	1.05	1.18	23.9	24.8	.22	.24	1.0	.59	.00	.00	1.25	.76	251.2	6.94	208
D	12: 3	455.3	454.1		59.9	7.4	89	2169	17188	2373	90.7	1.05	1.18	23.9	24.7	.22	.24	1.0	.62	.00	.00	1.29	.76	252.3	6.95	207
D	12: 5	456.4	455.8		44.4	7.5	89	1808	17188	2373	90.5	1.05	1.17	23.9	24.7	.22	.24	1.0	.53	.00	.00	1.25	.76	253.2	6.98	207
D	12: 6	457.3	456.8		68.7	6.2	90	1989	17188	2393	90.3	1.05	1.17	23.9	24.7	.22	.24	1.0	.58	.00	.00	1.25	.76	254.2	7.00	206
D	12: 7	458.3	457.8		42.7	6.6	90	1989	17039	2373	90.3	1.05	1.17	23.9	24.8	.22	.24	1.0	.68	.00	.00	1.25	.76	255.2	7.01	206
D	12: 8	459.2	458.2		47.1	7.5	89	1989	17218	2373	90.3	1.09	1.18	24.0	24.9	.22	.24	1.0	.57	.00	.00	1.31	.76	256.4	7.04	206
D	12:10	460.6	459.5		99.0	8.1	88	1989	17188	2373	90.1	1.06	1.18	24.0	25.0	.22	.24	.0	.53	.00	.00	1.24	.76	257.7	7.06	205
D	12:10	461.3	460.8		77.0	6.1	90	1989	16919	2371	90.3	1.06	1.18	24.0	25.1	.22	.24	1.0	.56	.00	.00	1.24	.76	258.2	7.07	205
D	12:17	462.2	461.1		57.4	6.6	88	1808	16089	2356	90.7	1.35	1.18	24.1	24.7	.22	.24	1.0	.54	.00	.00	1.29	.76	259.3	7.11	205
D	12:19	463.3	462.8	458.8	71.1	6.8	91	1989	17009	2356	90.1	1.13	1.17	24.0	24.6	.22	.24	1.0	.52	.00	.00	1.30	.76	260.2	5.11	159
D	12:20	464.2	463.0	459.0	46.2	5.2	93	1808	16739	2356	89.9	1.36	1.17	24.1	24.7	.22	.24	1.0	.56	.00	.00	1.47	.76	261.2	5.13	159
D	12:22	465.3	464.0	460.0	39.3	4.9	93	1808	16949	2356	89.9	1.05	1.16	24.1	24.9	.22	.24	1.0	.68	.00	.00	1.24	.76	262.2	5.15	159
D	12:23	466.3	465.8	461.8	32.3	6.2	90	1989	16799	2356	89.9	1.59	1.16	24.1	24.9	.22	.24	.0	.70	.00	.00	1.35	.76	263.2	5.18	159
D	12:24	467.4	466.8	462.8	66.5	7.3	91	1989	16979	2357	89.9	1.05	1.16	24.1	25.0	.22	.24	.0	.59	.00	.00	1.24	.76	264.2	5.20	159
D	12:26	468.2	467.8	463.8	31.7	6.9	92	1989	16859	2356	89.7	1.12	1.17	24.1	25.1	.22	.24	.0	.74	.00	.00	1.37	.76	265.2	5.23	159
D	12:28	469.3	468.8	464.8	32.1	7.2	90	1989	16919	2356	89.7	1.06	1.16	24.1	25.1	.22	.24	1.0	.65	.00	.00	1.25	.77	266.2	5.25	159
D	12:34	470.3	469.8	465.8	27.6	4.7	88	1808	17039	2312	86.1	1.05	1.18	24.2	25.4	.22	.24	1.0	.73	.00	.00	1.23	.77	267.2	5.28	159
D	12:35	471.3	470.8	466.8	66.8	6.7	90	1989	17129	2358	85.7	1.20	1.18	24.2	25.4	.22	.24	.0	.48	.00	.00	1.38	.77	268.2	5.30	159
D	12:36	472.3	471.8	467.8	53.1	7.9	90	1989	17089	2356	84.3	1.05	1.18	24.2	25.3	.22	.24	1.0	.64	.00	.00	1.24	.77	269.2	5.31	158
D	12:36	473.3	472.2	468.2	82.8	5.7	90	1989	17039	2364	83.5	1.80	1.18	24.2	25.2	.22	.24	1.0	.51	.00	.00	1.68	.77	270.4	5.32	158
D	12:37	474.3	473.8	469.8	66.2	6.6	91	1989	17129	2356	83.3	1.06	1.18	24.2	25.1	.22	.24	2.0	.53	.00	.00	1.25	.77	271.2	5.34	158
D	12:38	475.3	474.8	470.8	50.1	7.1	91	1989	17009	2356	82.7	1.05	1.18	24.1	25.1	.22	.24	1.0	.66	.00	.00	1.24	.77	272.2	5.35	158
D	12:39	476.3	475.8	471.8	61.8	7.8	90	2169	17069	2373	82.1	1.08	1.18	24.2	25.0	.22	.24	1.0	.48	.00	.00	1.30	.77	273.2	5.37	157
D	12:40	477.2	476.1	472.0	141.	7.3	89	2169	17039	2366	82.1	1.06	1.18	24.2	25.0	.22	.24	2.0	.45	.00	.00	1.24	.77	274.3	5.38	157
D	12:41	478.3	477.1	473.0	88.4	7.6	90	2169	17039	2376	81.9	1.05	1.17	24.2	25.0	.22	.24	2.0	.55	.00	.00	1.24	.77	275.2	5.39	157
D	12:46	479.2	478.8	474.8	99.8	.7	92	1265	17039	2339	84.9	1.05	1.17	24.2	25.4	.22	.24	.0	.49	.00	.00	1.24	.77	276.2	5.41	156
D	12:48	480.3	479.8	475.8	31.8	8.1	89	1989	17039	2344	83.1	1.05	1.17	24.3	25.5	.22	.24	.0	.74	.00	.00	1.23	.77	277.2	5.63	161
D	12:49	481.3	480.8	476.8	27.2	8.0	89	1989	17039	2339	82.1	1.10	1.17	24.2	25.4	.22	.24	1.0	.67	.00	.00	1.28	.77	278.2	5.66	160
D	12:50	482.3	481.8	477.8	59.9	7.5	90	1989	17039	2339	81.7	1.05	1.16	24.2	25.4	.22	.24	1.0	.63	.00	.00	1.23	.77	279.2	5.67	160
D	12:51	483.2	482.1	478.0	53.2	5.4	90	1989	17069	2357	81.7	1.19	1.16	24.2	25.4	.22	.24	1.0	.55	.00	.00	1.49	.77	280.3	5.69	160
D	12:53	484.3	483.2	479.2	37.8	6.8	90	1989	16979	2339	81.5	1.16	1.17	24.3	25.3	.22	.24	1.0	.60	.00	.00	1.25	.78	281.4	5.72	160
D	12:54	485.2	483.5	479.8	37.7	7.5	90	1989	17039	2339	81.7	1.43	1.18	24.3	25.4	.22	.24	2.0	.70	.00	.00	1.23	.78	281.7	5.73	160
D	12:55	486.2	485.8	481.8	68.7	6.7	90	1989	16889	2344	81.5	1.06	1.18	24.3	25.4	.22	.24	1.0	.57	.00	.00	1.24	.78	283.2	5.75	160
D	12:56	487.3	486.8	482.8	28.6	7.8	90	2169	17039	2339	81.3	1.09	1.18	24.4	25.4	.22	.24	1.0	.74	.00	.00	1.27	.78	284.2	5.78	159
D	13: 2	488.2	487.8	483.8	32.2	4.8	87	1808	17408	2393	86.1	1.09	1.09	24.5	25.4	.22	.24	.0	.67	.00	.00	1.27	.78	285.2	5.80	159
D	13: 4	489.3	488.2	484.2	40.7	7.4	90	2169	17089	2376	84.3	1.09	1.10	24.4	25.2	.22	.24	.0	.68	.00	.00	1.27	.78	286.3	5.83	159
D	13: 5	490.3	489.8	485.8	57.9	7.7	90	1989	16979	2356	82.7	1.09	1.10	24.5	25.3	.22	.25	1.0	.62	.00	.00	1.27	.78	287.2	5.84	159
D	13: 7	491.3	490.1	486.0	32.4	7.4	90	1989	16919	2356	82.1	1.09	1.11	24.4	25.4	.22	.25	1.0	.73	.00	.00	1.27	.78	288.3	5.87	159
D	13: 9	492.2	491.0	487.0	65.8	8.5	92	1989	16809	2358	81.3	1.09	1.11	24.6	25.4	.22	.25	2.0	.57	.00	.00	1.27	.78	289.2	5.90	159
D	13:10	493.3	492.8	488.8	36.5	6.5	90	1989	16869	2356	81.3	1.09	1.12	24.5	25.4	.22	.25	3.0	.69	.00	.00	1.27	.78	290.2	5.93	159
D	13:11	494.3	493.8	489.8	44.3	7.8	89	2169	16889	2337	81.3	1.09	1.11	24.5	25.4	.22	.25	3.0	.66	.00	.00	1.26	.78	291.2	5.94	159
D	13:12	495.2	494.1	490.0	35.8	7.6	90	1989	16829	2337	80.9	1.09	1.10	24.5	25.4	.22	.24	3.0	.70	.00	.00	1.26	.78	292.2	5.97	159
												1.06	1.07								1.06					

BEGINNING OF WELL
NO TREND SELECTED FOR DCS
PF = 1.02

GEOSERVICES — HAMMERHEAD #1 — DATE : 19/ 5/82

ON-LINE TDC

BIT #3 RUN #1 RD BIT & H BIT DIAMETER : 36.00 inch NOZZ 20/20/20 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY BCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	net	net	net	m/Hr	tons	rpm	KNm	kPa	l/mn	m3	sg		degC		ohmm		unit		sg	sg	sg		net	DHr	$/m
D	13:14	496.4	495.8	470.0	31.8	7.7	87	1989	16568	2337	80.3	1.09	1.10	24.6	25.4	.22	.24	2.0	.73	.00	.00	1.26	.00	293.2	5.99	159
D	13:21	497.2	496.1	478.0	23.9	6.2	90	1989	17039	2373	82.9	1.09	1.10	24.6	25.6	.22	.24	1.0	.73	.00	.00	1.27	.00	294.3	6.02	159
D	13:22	498.2	497.1	478.0	36.1	6.6	90	1989	17069	2376	81.1	1.09	1.10	24.6	25.4	.22	.25	2.0	.68	.00	.00	1.27	.00	295.3	6.05	159
D	13:24	499.3	498.0	470.0	46.3	7.3	89	2169	17129	2356	80.7	1.09	1.10	24.6	25.5	.22	.25	2.0	.65	.00	.00	1.27	.00	296.2	6.07	159
D	13:25	500.3	499.1	480.0	48.6	7.8	91	2169	17069	2356	80.3	1.09	1.11	24.6	25.6	.22	.25	2.0	.64	.00	.00	1.27	.00	297.3	6.09	159
D	13:26	502.2	501.1	490.0	308.	7.6	90	1989	17069	2339	80.1	1.09	1.11	24.6	25.4	.22	.25	2.0	.29	.00	.00	1.26	.00	299.3	6.11	158
D	13:26	502.3	501.1	490.0	308.	7.8	92	1989	17039	2376	80.1	1.09	1.10	24.6	25.4	.22	.24	2.0	.29	.00	.00	1.27	.00	299.3	6.11	158
D	13:28	503.3	502.0	490.0	64.0	7.1	91	1989	17129	2356	79.9	1.09	1.10	24.6	25.5	.22	.24	2.0	.59	.00	.00	1.26	.00	300.2	6.13	158
D	13:29	504.3	503.1	490.0	44.1	7.4	91	1989	17127	2341	80.1	1.09	1.10	24.7	25.6	.22	.24	2.0	.67	.00	.00	1.26	.00	301.3	6.15	158
D	13:30	505.3	504.1	490.0	64.2	7.6	91	1989	17099	2337	80.1	1.09	1.09	24.6	25.7	.22	.24	1.0	.60	.00	.00	1.26	.00	302.3	6.17	158
D	13:50	515.1	513.5	500.0	27.8	8.1	90	2169	17099	2356	79.1	1.09	1.05	24.9	25.8	.22	.24	1.0	.76	.00	.00	1.26	.00	311.7	6.31	155
D	13:51	516.1	515.1	500.0	53.2	6.7	90	1989	17218	2366	78.9	1.09	1.05	24.9	25.8	.22	.25	1.0	.62	.00	.00	1.26	.00	313.2	6.34	155
D	13:57	517.1	515.5	500.0	46.3	4.2	90	1888	17089	2354	81.7	1.09	1.09	24.9	26.1	.23	.25	1.0	.63	.00	.00	1.26	.00	313.7	6.37	155
D	13:59	518.1	516.5	500.0	30.0	7.9	89	2169	16949	2356	79.9	1.09	1.09	24.9	25.9	.23	.25	1.0	.66	.00	.00	1.26	.00	314.7	6.40	155
D	14: 1	519.1	518.0	500.0	22.1	7.8	93	2169	17129	2337	78.7	1.09	1.09	25.0	25.7	.23	.25	1.0	.81	.00	.00	1.26	.00	316.2	6.43	155
D	14: 2	520.1	518.5	500.0	46.3	7.8	92	2169	17129	2376	78.3	1.09	1.08	24.9	25.6	.23	.24	1.0	.66	.00	.00	1.26	.00	316.7	6.45	155
D	14: 3	521.0	520.0	500.0	72.3	6.9	91	2169	17099	2344	78.1	1.09	1.08	24.9	25.6	.23	.25	1.0	.56	.00	.00	1.26	.00	318.2	6.46	155
D	14: 4	522.1	521.0	505.0	31.9	8.3	93	1989	17159	2356	77.9	1.09	1.08	25.0	25.7	.23	.25	1.0	.73	.00	.00	1.26	.00	319.2	6.49	155
D	14: 6	523.0	521.5	505.0	44.4	7.7	91	2169	17218	2376	78.1	1.09	1.08	25.0	25.6	.23	.25	1.0	.66	.00	.00	1.26	.00	319.7	6.50	155
D	14: 8	524.0	522.5	505.0	38.0	7.8	92	2169	16829	2356	77.9	1.09	1.09	25.0	25.9	.23	.24	.0	.69	.00	.00	1.26	.00	320.7	6.54	155
D	14: 9	525.1	524.0	505.0	45.9	7.4	92	1989	17129	2376	77.9	1.09	1.09	25.0	25.9	.23	.24	.0	.65	.00	.00	1.26	.00	322.2	6.57	155
D	14:16	526.1	524.6	505.0	42.9	5.6	93	1989	17039	2341	80.7	1.09	.82	25.1	26.1	.23	.24	.0	.66	.00	.00	1.25	.00	322.0	6.60	155
D	14:18	527.1	526.0	505.0	44.2	6.4	94	1989	17089	2337	79.5	1.09	1.09	25.0	25.9	.23	.25	.0	.65	.00	.00	1.25	.00	324.2	6.62	155
D	14:19	528.0	526.6	520.0	41.8	8.4	93	2169	16979	2337	78.5	1.09	1.09	25.1	25.9	.23	.25	1.0	.67	.00	.00	1.26	.00	324.8	6.64	155
D	14:20	529.0	527.5	520.0	46.1	6.9	94	1989	16949	2337	77.9	1.09	1.09	25.1	25.8	.23	.25	1.0	.67	.00	.00	1.25	.00	326.2	6.66	155
D	14:22	530.1	529.0	520.0	27.8	7.0	94	2169	16859	2337	77.8	1.09	1.09	25.1	25.6	.23	.25	1.0	.74	.00	.00	1.25	.00	327.2	6.70	155
D	14:24	532.0	529.5	520.0	30.1	7.0	93	2169	17089	2356	77.6	1.09	1.09	25.1	25.8	.23	.25	1.0	.73	.00	.00	1.25	.00	327.7	6.72	155
D	14:26	533.1	532.0	520.0	34.8	7.1	94	1989	16949	2344	77.6	1.09	1.09	25.1	25.9	.23	.25	1.0	.71	.00	.00	1.25	.00	330.2	6.76	155
D	14:28	534.0	532.5	520.0	25.1	8.4	92	2169	16979	2337	77.4	1.09	1.09	25.1	26.0	.23	.25	1.0	.77	.00	.00	1.25	.00	330.7	6.79	155
D	14:30	535.0	533.5	520.0	28.4	7.6	93	2169	16320	2337	77.2	1.09	1.09	25.2	26.0	.23	.25	1.0	.77	.00	.00	1.25	.01	331.7	6.82	155
D	14:38	536.0	535.0	520.0	22.8	7.5	89	2350	16799	2319	80.3	1.09	1.09	25.1	25.9	.23	.25	.0	.75	.00	.00	1.25	.01	333.2	6.86	155
D	14:39	537.0	536.0	520.0	53.1	7.9	92	2350	16679	2337	78.7	1.09	1.09	25.1	25.6	.23	.25	1.0	.64	.00	.00	1.25	.01	334.2	6.89	155
D	14:41	538.0	537.0	520.0	46.2	7.6	92	2350	16530	2337	77.4	1.09	1.09	25.2	25.6	.23	.25	2.0	.66	.00	.00	1.25	.01	335.2	6.91	155
D	14:42	539.0	538.0	520.0	42.7	7.9	93	2350	17099	2356	76.4	1.09	1.09	25.1	25.6	.23	.25	1.0	.67	.00	.00	1.25	.01	336.2	6.93	155
D	14:44	540.0	539.0	520.0	42.2	8.5	92	2350	16829	2337	76.8	1.09	1.09	25.2	25.6	.23	.25	1.0	.69	.00	.00	1.25	.01	337.2	6.96	155
D	14:46	541.1	540.0	530.0	46.4	7.4	93	2350	17108	2356	75.8	1.09	1.09	25.2	25.7	.23	.25	.0	.66	.00	.00	1.25	.01	338.2	6.99	155
D	14:47	542.0	541.0	530.0	39.7	8.0	94	1909	17069	2356	75.6	1.09	1.09	25.1	25.9	.23	.25	.0	.70	.00	.00	1.25	.01	339.2	7.01	155
D	14:48	543.0	541.5	530.0	41.1	8.0	93	2169	16949	2337	75.2	1.09	1.09	25.2	25.9	.23	.25	.0	.68	.00	.00	1.25	.01	339.7	7.04	155
D	14:50	544.1	543.0	530.0	45.8	7.4	93	2169	16200	2341	74.8	1.09	1.09	25.2	25.9	.23	.25	.0	.65	.00	.00	1.25	.01	341.2	7.06	155
D	14:56	545.1	544.1	530.0	23.7	6.9	92	2169	17278	2376	78.1	1.09	1.09	25.2	26.1	.23	.25	.0	.74	.00	.00	1.25	.01	342.3	7.10	155
D	14:57	546.2	545.1	.0	110.	7.5	92	2169	17039	2337	77.9	1.09	1.09	25.2	26.1	.23	.25	.0	.49	.00	.00	1.25	.01	343.3	7.10	155
D	14:58	547.0	546.0	.0	36.2	9.6	92	2169	17248	2376	77.2	1.09	1.09	25.2	25.9	.23	.25	1.0	.71	.00	.00	1.25	.01	344.2	7.13	155
D	15: 0	548.1	547.0	.0	44.3	8.1	93	2169	17129	2356	76.6	1.09	1.09	25.2	25.8	.23	.25	1.0	.67	.00	.00	1.25	.01	345.2	7.16	155
D	15: 2	549.1	548.1	.0	39.7	8.6	91	2169	17338	2349	76.6	1.09	1.09	25.2	25.7	.23	.25	1.0	.70	.00	.00	1.25	.01	346.3	7.18	155
D	15: 3	550.1	548.6	.0	26.5	8.3	92	2169	17248	2376	76.0	1.09	1.09	25.2	25.8	.23	.25	1.0	.77	.00	.00	1.25	.01	346.7	7.21	155
D	15: 6	551.0	549.5	.0	30.5	9.1	94	1989	17089	2371	76.4	1.09	1.09	25.3	25.9	.23	.25	.0	.75	.00	.00	1.25	.01	347.7	7.25	155
D	15: 9	552.1	551.1	.0	19.0	8.0	93	1989	17248	2358	75.6	1.09	1.09	25.2	25.9	.23	.25	1.0	.85	.00	.00	1.25	.01	349.3	7.30	155
D	15:11	553.1	552.1	.0	31.1	7.7	94	1989	17218	2373	75.4	1.09	1.09	25.2	25.9	.23	.25	1.0	.74	.00	.00	1.25	.02	350.3	7.33	155
D	15:13	554.0	552.5	.0	23.2	6.9	94	1989	17248	2368	75.4	1.09	1.09	25.2	25.9	.23	.25	1.0	.78	.00	.00	1.25	.02	350.7	7.36	156

1.08 1.08

BEGINNING of WELL
NO TREND SELECTED FOR DCS
PF = 1.02

GEOSERVICES — HAMMERHEAD #1 — DATE : 19/ 5/82

ON-LINE TDC

BIT #3 RUN #1 RD BIT & H BIT DIAMETER : 36.00 inch NOZZ 20/20/20 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	MEASURED DEPTHS	VERTCL	LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY WORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	tons	rpm	Nm	kPa	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	Hr	$/m
D	15:24	555.2	554.0	.0	39.6	8.0	93	2169	17039	2339	76.6	1.09	1.09	25.3	26.0	.23	.25	1.0	.60	.00	.00	1.09	.82	352.2	7.42	156
D	15:25	556.1	554.6	.0	43.1	7.8	94	2169	17039	2356	76.2	1.09	1.09	25.2	25.8	.23	.26	1.0	.69	.00	.00	1.09	.82	353.2	7.44	156
D	15:28	557.8	555.5	555.0	17.8	6.4	95	1909	16879	2319	75.8	1.09	1.09	25.2	25.5	.23	.25	1.0	.86	.00	.00	1.09	.82	353.7	7.48	156
D	15:29	558.1	557.1	.0	55.8	8.2	93	2169	17129	2337	74.6	1.09	1.09	25.3	25.5	.23	.25	1.0	.63	.00	.00	1.09	.81	355.3	7.51	156
D	15:31	559.8	558.8	.0	35.8	8.3	94	2169	17129	2337	74.2	1.09	1.09	25.2	25.7	.23	.25	1.0	.72	.00	.00	1.09	.82	356.2	7.53	156
D	15:32	560.8	559.5	.0	44.4	7.8	94	2169	17069	2356	74.4	1.09	1.09	25.3	25.8	.23	.25	1.0	.67	.00	.00	1.09	.82	356.7	7.56	156
D	15:34	561.8	560.8	.0	38.9	7.5	94	1909	17039	2337	74.6	1.09	1.09	25.3	25.8	.23	.25	1.0	.73	.00	.00	1.09	.82	358.2	7.59	156
D	15:36	562.1	560.6	.0	31.2	9.3	93	2169	17159	2337	73.8	1.09	1.09	25.2	25.9	.23	.25	1.0	.74	.00	.00	1.09	.82	358.8	7.61	156
D	15:38	563.1	562.0	.0	29.3	7.7	93	2169	17186	2337	74.0	1.09	1.10	25.2	25.9	.23	.25	1.0	.74	.00	.00	1.09	.82	360.2	7.64	156
D	15:44	565.0	562.5	.0	49.9	.0	0	362	16829	2337	73.2	1.09	1.09	25.3	26.5	.23	.25	1.0	.66	.00	.00	1.09	.82	360.7	7.68	156
T	16:22	565.0	562.5	9907.4			0	362	17248	2337	74.0	1.09	1.10	25.6	27.2	.23	.25	1.0								

BEGINNING OF WELL

NO TREND SELECTED FOR DCS

PF = 1.03

1.08

ON-LINE TDC
GEOSERVICES

BIT REPORT

19/ 5/82 HAMMERHEAD #1

#BIT HEADING :BIT #3 RUN #1
#BIT TYPE :TOOTH
#BIT IDENTITY :RD FP 12

#BIT SIZE : 12.25 INCH
#BIT COST : 10000. $ RIG COST/HR: 5033.

#NOZZLES : 13 13 13 /32NDS @ 95 % EFFICIENCY

#DEPTH IN : 283.24 METERS 19/ 5/82
#DEPTH OUT : 565.00 METERS 19/ 5/82
#METRAGE : 361.76 METERS
#TOTAL REVOLUTIONS : 26

#DRILLING TIME: 7:41 HR AVERAGE ROP: 47.10 M/HR
#TIME IN HOLE : 12:16 HR AVERAGE ROP: 29.50 M/HR
#TRIP TIME : 2: 0 HR

#DRILLING COST STANDARD : 257.6 $/MET
#DRILLING COST ON BOTTOM : 183.7 $/MET
#DRILLING COST MINIMUM : 154.8 $/MET

AVERAGE OVER THE RUN AVERAGE HYDRAULICS
#WEIGHT ON BIT : 6.22 TONS NOZZLES SPEED : 156.09 M/S
#ROTATION : 89.94 RPM PRESSURE DROP : 14695 KPA
#FLOW RATE :2348.00 L/MN HYDRAULIC POWER: 771.27 H.P
#STAND PIPE PRESSURE: 17102 KPA

BOFF

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

23/ 5/82 — HAMMERHEAD #1

BIT #3 RUN #2 SEQ NBR: 3

STARTING DEPTH 195.00 METERS

BIT DATA SIZE 26.00
TOOTH FP 12+0H
NOZZLES 32 32 32 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	11	9.22	4.28	5.00	29.02
2	DRILL COLLAR	1	56.68	2.81	7.75	207.00
3	DRILL COLLAR	1	34.21	3.00	9.50	322.90

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	28.00	143.00	194.00
OPEN HOLE 1	26.00	194.00	195.00

COST DATA BIT COST 3000 $ RIG COST 5033 $/HR
TRIP TIME 2.00 HRS

WEIGHTS HOOK LOAD OFF BOTTOM 66.0 TONS
STRING WEIGHT IN AIR 25.7 TONS

VOLUMES ANNULUS 36.2 M3 IN PIPES 1.3 M3

DEVIATION 1.0 DEG 1.75 M / 100 M

HYDRAULICS NOMINAL ANNULUS PRESSURE LOSSES AT 1600 L/MN : 9 KPA

BIT WEAR TYPE EXPONENT .5
EXPECTED: RUN LENGTH 371 METERS TEETH WEAR 2 /8TH

GEOSERVICES — HANNERHEAD #1 — DATE : 24/ 5/82

ON-LINE TDC

BIT #3 RUN #2 FP 12+0H — BIT DIAMETER : 26.00 inch — NOZZ 32/32/32 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	tons	rpm	Nm	kPa	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	Hr	$/m
D	0:39	290.3	146.9	95.0	52.0	.2	75	2531	3083	3381	27.5	1.02	.00	14.7	.0	.19	.00	1.0	.46	.00	.00	1.03	.53	95.2	.00	159
D	0:40	291.0	147.6	95.0	112.	.6	75	2531	3713	3324	26.9	1.02	.00	14.8	.0	.19	.00	1.0	.33	.00	.00	1.03	.53	96.0	.00	159
D	1:10	300.5	298.6	95.0	19.2	.0	79	2169	3923	3342	46.8	1.02	.00	14.7	.0	.19	.00	1.0	.59	.00	.00	1.04	.64	96.5	3.90	387
D	1:11	301.1	300.1	95.0	66.3	-.3	77	1989	3923	3361	45.7	1.02	.00	14.8	.0	.19	.00	1.0	-.00	.00	.00	1.04	.65	186.0	3.92	354
D	1:12	302.0	300.7	95.0	33.3	.4	75	2531	3923	3381	44.3	1.02	.00	14.8	.0	.19	.00	1.0	.00	.00	.00	1.04	.65	186.6	3.93	353
D	1:13	303.4	302.2	95.0	39.2	1.2	75	2892	3923	3361	42.9	1.02	.00	14.7	.0	.19	.00	1.0	.47	.00	.00	1.04	.65	188.1	3.95	349
D	1:14	304.1	303.1	95.0	30.3	-.5	78	2169	3923	3369	41.9	1.02	.00	14.8	.0	.19	.00	1.0	.00	.00	.00	1.03	.65	189.0	3.97	347
D	1:17	305.1	303.5	95.0	36.5	.7	75	2531	3923	3381	38.9	1.02	.00	14.8	.0	.19	.00	2.0	.00	.00	.00	1.04	.65	189.5	4.02	346
D	1:18	306.1	304.7	95.0	88.0	-.4	74	2712	3923	3361	38.3	1.02	.00	14.8	.0	.19	.00	2.0	.35	.00	.00	1.03	.65	110.7	4.03	345
D	1:20	307.1	305.6	95.0	69.3	.8	74	2712	3923	3361	36.3	1.02	.00	14.8	.0	.19	.00	2.0	-.00	.00	.00	1.03	.65	111.5	4.07	343
D	1:21	308.1	307.1	95.0	88.5	.3	75	3435	3923	3381	35.9	1.02	.00	14.8	.0	.19	.00	2.0	-.00	.00	.00	1.03	.65	113.0	4.09	341
D	1:23	309.1	307.7	95.0	40.6	.5	77	1989	3953	3361	34.7	1.02	.00	14.8	.0	.19	.00	2.0	.53	.00	.00	1.03	.65	113.6	4.11	340
D	1:30	310.1	308.9	95.0	49.4	1.0	74	2712	3953	3378	39.7	1.02	.00	14.8	.0	.19	.00	2.0	.00	.00	.00	1.04	.65	114.9	4.13	337
D	1:33	311.1	309.5	95.0	20.2	-1.0	76	2169	3953	3378	39.1	1.02	.00	14.8	.0	.19	.00	2.0	.55	.00	.00	1.04	.65	115.5	4.17	337
D	1:35	312.1	310.5	305.0	15.1	.9	74	3073	3953	3378	38.1	1.02	.00	14.8	.0	.19	.00	2.0	-.00	.00	.00	1.03	.66	116.5	4.21	336
D	1:38	313.1	312.1	305.0	88.4	1.0	74	3073	3953	3393	37.1	1.02	.00	14.8	.0	.19	.00	2.0	.37	.00	.00	1.04	.66	118.0	4.25	334
D	1:41	314.1	313.1	305.0	23.1	.8	74	3073	3953	3381	36.3	1.02	.00	14.8	.0	.19	.00	2.0	.00	.00	.00	1.04	.66	119.1	4.30	334
D	1:47	315.2	314.0	305.0	16.8	3.0	74	3073	3953	3378	34.5	1.02	.00	14.8	.0	.19	.00	2.0	.77	.00	.00	1.04	.66	120.0	4.36	334
D	1:48	316.2	315.0	305.0	66.0	2.0	75	2892	3953	3378	34.3	1.02	.00	14.8	.0	.19	.00	2.0	.52	.00	.00	1.03	.66	121.0	4.38	332
D	2: 0	317.0	315.6	305.0	3.2	3.0	75	2712	3923	3413	33.7	1.02	.00	14.8	.0	.19	.00	.0	1.11	.00	.00	1.04	.66	121.6	4.59	339
D	2:14	318.1	316.6	305.0	114.	.0	82	1808	3923	3381	43.9	1.02	.00	14.8	.0	.19	.00	.0	.41	.00	.00	1.04	.66	122.6	4.60	338
D	2:15	319.2	317.5	305.0	103.	1.1	75	2359	3893	3361	43.7	1.02	.00	14.8	.0	.19	.00	.0	.41	.00	.00	1.03	.66	123.5	4.61	336
D	2:17	320.1	319.1	305.0	29.3	1.0	75	2531	3893	3361	42.9	1.02	.00	14.8	.0	.19	.00	.0	.65	.00	.00	1.03	.66	125.1	4.64	334
D	2:19	321.1	319.6	305.0	69.3	1.1	78	1989	3923	3381	42.1	1.02	.00	14.8	.0	.19	.00	.0	.48	.00	.00	1.04	.66	125.6	4.67	333
D	2:20	322.0	321.0	305.0	27.6	4.4	74	3073	3923	3381	41.5	1.02	.00	14.8	.0	.19	.00	.0	.69	.00	.00	1.04	.66	127.0	4.69	331
D	2:21	323.0	321.5	305.0	66.0	2.3	79	2892	3953	3381	41.1	1.02	.00	14.8	.0	.19	.00	.0	.52	.00	.00	1.04	.66	127.5	4.71	330
D	2:22	324.1	323.1	305.0	82.5	3.9	78	3073	3953	3381	40.7	1.02	.00	14.8	.0	.19	.00	.0	.49	.00	.00	1.03	.67	129.1	4.73	327
D	2:24	325.0	324.0	305.0	18.1	5.0	79	3254	3983	3398	39.9	1.02	.00	14.8	.0	.19	.00	.0	.81	.00	.00	1.03	.67	130.0	4.76	326
D	2:25	326.0	324.6	305.0	66.6	3.0	78	3435	3983	3381	39.5	1.02	.00	14.8	.0	.19	.00	.0	.55	.00	.00	1.04	.67	130.6	4.77	325
D	2:31	327.1	326.0	305.0	88.7	3.3	76	2531	3953	3398	37.7	1.02	.00	14.8	.0	.19	.00	.0	.46	.00	.00	1.03	.67	132.0	4.87	326
D	2:42	328.2	327.2	305.0	16.5	1.6	81	2892	4013	3408	44.3	1.02	.00	14.8	.0	.19	.00	.0	.72	.00	.00	1.04	.67	133.1	4.94	327
D	2:45	329.1	327.6	305.0	9.2	1.6	82	2892	4013	3398	42.7	1.02	.00	14.8	.0	.19	.00	.0	.86	.00	.00	1.04	.67	133.5	4.99	327
D	2:50	330.3	329.3	305.0	17.5	3.4	81	2712	4013	3400	41.1	1.02	.00	14.8	.0	.19	.00	.0	.79	.00	.00	1.04	.67	135.2	5.06	327
D	2:52	331.1	329.7	305.0	20.3	3.4	81	2892	4013	3398	40.5	1.02	.00	14.8	.0	.19	.00	.0	.73	.00	.00	1.04	.67	135.6	5.09	327
D	2:53	332.0	330.5	305.0	49.7	2.7	80	3435	4013	3415	39.5	1.02	.00	14.8	.0	.19	.00	.0	.55	.00	.00	1.04	.67	136.5	5.12	325
D	3: 2	333.1	332.1	305.0	17.0	3.3	79	3073	4013	3398	36.5	1.02	.00	14.8	.0	.19	.00	.0	.79	.00	.00	1.03	.67	138.1	5.27	329
D	3: 8	334.0	333.0	305.0	5.7	3.4	76	2892	3863	3361	34.5	1.02	.00	14.8	.0	.19	.00	.0	.98	.00	.00	1.03	.67	139.0	5.36	330
D	3:15	335.1	334.1	305.0	5.1	2.0	76	2359	3863	3330	32.3	1.02	.00	14.8	.0	.19	.00	.0	.96	.00	.00	1.03	.67	140.0	5.47	333
D	3:18	336.3	334.5	305.0	15.1	3.6	74	3073	3863	3327	31.1	1.02	.00	14.8	.0	.19	.00	.0	.70	.00	.00	1.03	.67	140.5	5.52	333
D	3:28	337.1	335.6	305.0	87.3	2.7	74	2892	3893	3342	37.1	1.02	.00	14.8	.0	.19	.00	.0	.45	.00	.00	1.04	.67	141.5	5.59	331
D	3:35	338.1	336.6	305.0	44.3	2.6	68	2892	3863	3387	35.1	1.02	.00	14.8	.0	.19	.00	.0	.55	.00	.00	1.03	.68	142.5	5.70	332
D	3:39	339.1	338.1	305.0	17.1	1.7	72	2892	3893	3349	33.9	1.02	.00	14.8	.0	.19	.00	.0	.67	.00	.00	1.03	.68	144.1	5.78	336
D	3:46	340.1	338.5	305.0	6.1	3.2	75	3073	3923	3361	31.5	1.02	.00	14.8	.0	.19	.00	.0	.92	.00	.00	1.03	.68	144.5	5.89	337
D	3:49	341.1	339.7	305.0	21.6	1.8	76	2531	3923	3361	30.9	1.02	.00	14.8	.0	.19	.00	.0	.68	.00	.00	1.03	.68	145.7	5.93	338
D	3:52	342.0	341.0	305.0	29.6	3.0	76	2531	3923	3359	29.9	1.02	.00	14.8	.0	.19	.00	.0	.64	.00	.00	1.03	.68	147.0	5.98	337
D	4: 1	343.0	341.5	305.0	4.1	2.6	75	2531	3923	3371	29.3	1.02	.00	14.8	.0	.19	.00	.0	1.02	.00	.00	1.03	.68	147.5	6.13	341
D	4: 4	344.0	342.5	305.0	19.9	2.0	77	2359	3953	3361	29.5	1.02	.00	14.7	.0	.19	.00	.0	.72	.00	.00	1.03	.68	148.5	6.19	341
D	4: 7	345.2	343.7	305.0	38.9	2.3	76	2892	3953	3361	30.3	1.02	.00	14.7	.0	.19	.00	.0	.61	.00	.00	1.04	.68	149.7	6.23	340
D	4:21	346.1	345.1	305.0	35.9	2.0	78	3073	3773	3298	42.9	1.02	.00	14.8	.0	.19	.00	.0	.59	.00	.00	1.03	.68	151.1	6.33	341

GEOSERVICES — HAMMERHEAD #1 — DATE : 24/ 5/82

ON-LINE TDC

BIT #3 RUN #2 FP 12+0H BIT DIAMETER : 26.00 inch NOZZ 32/32/32 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	WORM	PF	CCD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	tons	rpm	N*m	kPa	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	4:26	347.0	346.0	305.0	11.2	2.9	71	2350	3803	3308	41.7	1.02	.00	14.8	.0	.19	.00	.0	.81	.00	.00	1.03	.60	152.0	6.42	343
D	4:31	348.3	347.1	305.0	3.4	3.2	71	3073	3803	3308	40.5	1.02	.00	14.8	.0	.19	.00	.0	1.00	.00	.00	1.03	.60	153.0	6.49	343
D	4:35	349.1	348.1	305.0	11.0	3.6	72	2712	3803	3325	39.5	1.02	.00	14.7	.0	.19	.00	.0	.84	.00	.00	1.03	.60	154.1	6.56	344
D	4:39	350.0	349.0	305.0	28.9	1.7	72	2531	3803	3344	39.5	1.02	.00	14.6	.0	.19	.00	.0	.62	.00	.00	1.04	.60	155.0	6.62	344
D	4:43	351.0	349.6	305.0	74.2	3.9	73	3073	3833	3325	38.1	1.02	.00	14.7	.0	.19	.00	.0	.44	.00	.00	1.03	.60	155.5	6.69	343
D	4:49	352.2	351.1	305.0	8.8	3.6	74	2531	3833	3325	36.5	1.02	.00	14.6	.0	.19	.00	.0	.87	.00	.00	1.03	.60	157.1	6.79	345
D	4:58	353.0	352.0	305.0	46.5	2.9	74	3073	3773	3315	35.9	1.02	.00	14.6	.0	.19	.00	.0	.53	.00	.00	1.03	.60	158.0	6.81	344
D	5: 5	354.0	352.5	305.0	3.9	4.0	72	2892	3773	3313	33.3	1.02	.00	14.6	.0	.19	.00	.0	1.06	.00	.00	1.03	.60	158.5	7.04	348
D	5:18	355.1	354.1	305.0	8.8	2.7	74	2712	4132	3418	42.1	.99	.00	14.6	.0	.19	.00	.0	.91	.00	.00	.99	.60	160.0	7.14	352
D	5:20	356.0	354.5	305.0	21.3	2.6	74	2531	4102	3418	40.9	.99	.00	14.6	.0	.19	.00	.0	.72	.00	.00	.99	.60	161.0	7.18	351
D	5:29	357.0	355.5	305.0	13.3	3.3	75	2712	4132	3438	37.3	.99	.00	14.6	.0	.19	.00	.0	.83	.00	.00	1.00	.60	161.5	7.32	352
D	5:35	358.0	356.6	305.0	15.6	2.2	78	1989	4132	3438	35.3	1.02	.00	14.7	.0	.19	.00	.0	.77	.00	.00	1.03	.60	162.5	7.42	354
D	5:40	359.3	358.1	.0	10.8	3.2	75	2892	4132	3418	33.3	1.02	.00	14.7	.0	.19	.00	.0	.82	.00	.00	1.03	.60	164.1	7.50	356
D	5:44	360.8	359.8	.0	13.4	3.0	74	2892	4132	3438	32.3	1.01	.00	14.6	.0	.19	.00	.0	.81	.00	.00	1.02	.60	165.0	7.56	356
D	5:47	361.2	360.1	.0	18.8	2.6	75	3435	4132	3435	31.1	.99	.00	14.6	.0	.19	.00	.0	.77	.00	.00	1.00	.60	166.1	7.62	356
D	5:53	362.1	361.1	.0	8.7	3.7	75	2892	4132	3428	29.3	.99	.00	14.6	.0	.19	.00	.0	.89	.00	.00	1.00	.60	167.0	7.72	358
D	5:56	363.1	362.1	.0	26.3	3.8	73	2892	4102	3411	28.5	.98	.00	14.6	.0	.19	.00	.0	.71	.00	.00	1.00	.60	168.1	7.77	357

1.02

ON-LINE TDC
GEOSERVICES HYDRAULIC REPORT

24/ 5/82 TIME 6:12 HAMMERHEAD #1

DEPTH OF EXECUTION 363.97 METERS
FLOW RATE 3403 L/MN POWER LAW

MUD DATA	WEIGHT	1.02	SG
————	PV	3	CPS
	YP	.10	LB/FT2
	GEL	.10	LB/100 FT2
	N	1.0000	
	K	.0059	LB/100 FT2
HOLES VOLUMES	WITH PIPES	95.01	M3
————	WITHOUT PIPES	98.01	M3
	ANNULAR	92.06	M3
	INSIDE PIPES	2.95	M3

	FROM	TO	PIPE ID	PIPE OD	HOLE DIAM	P.LOSSES	H.P	TYPE	CRITICAL FLOW	MUD VELOCITY	CUTTINGS VELOCITY
	METERS		INCH	INCH	INCH	KPA			L/MN	M/MN	M/MN
SURF.EQPT						644	49				
DR.STRING	.00	276.60	4.28	5.00		645	49				
DR.STRING	276.60	333.28	2.81	7.75		986	75				
DR.STRING	333.28	367.49	3.00	9.50		437	33				
BIT						785	60	M/S		37.3	
ANNULUS	363.97	329.76	9.50	26.00		0	0	TU	352.7	11.5	4.1
ANNULUS	329.76	273.08	7.75	26.00		0	0	TU	335.3	10.9	3.5
ANNULUS	273.08	194.00	5.00	26.00		0	0	TU	308.0	10.3	2.9
ANNULUS	194.00	143.00	5.00	28.00		0	0	TU	327.9	8.8	1.4
ANNULUS	143.00	.00	5.00	16.75		1	0	TU	216.1	26.3	10.9
TOTAL						3498	266				

ANNULAR PRESSURE LOSSES 1 KPA

EQUIV.CIRCULATING DENSITY 1.02 SG
MAX DEPTH 4470.61

MUD LAG TIMES	S -> B	.87	MN
————	B -> S	27.85	MN
CUTTINGS DATA	SIZE	.20	CM
————	DENSITY	2.40	SG
	LAG TIME	94.63	MN
	MAX SLIP VELOCITY	7.40	M/MN
BIT DATA	SIZE	26.00	INCH
————	NOZZLES	32 32 32	/32NDS
	NOZZLES EFFICIENCY	95	%
	BIT P. LOSSES	785	KPA
	H.H.P RATIO	22.45	%
	BIT H.H.P	.113	
	BIT VELOCITY	37.34	M/S

ON-LINE TDC
GEOSERVICES BIT REPORT

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\# 24/ 5/82 HAMMERHEAD #1

****

****

#BIT HEADING :BIT #3 RUN #2
#BIT TYPE :TOOTH #
#BIT IDENTITY :FP 12+OH #

****

#BIT SIZE : 26.00 INCH #
#BIT COST : 3000. $ RIG COST/HR: 5833. #

****

#NOZZLES : 32 32 32 /32NDS @ 95 % EFFICIENCY #

****

#DEPTH IN : 195.46 METERS 24/ 5/82 #
#DEPTH OUT : 363.97 METERS 24/ 5/82 #
#METRAGE : 168.51 METERS #
#TOTAL REVOLUTIONS : 19 #

****

#DRILLING TIME: 7:53 HR AVERAGE ROP: 21.39 M/HR #
#TIME IN HOLE : 5:29 HR AVERAGE ROP: 30.75 M/HR #
#TRIP TIME : 2: 0 HR #

****

#DRILLING COST STANDARD : 276.7 $/MET #
#DRILLING COST ON BOTTOM : 359.7 $/MET #
#DRILLING COST MINIMUM : 150.6 $/MET #

****

\# AVERAGE OVER THE RUN AVERAGE HYDRAULICS #

#WEIGHT ON BIT : 3.38 TONS NOZZLES SPEED : 36.91 M/S #
#ROTATION : 75.00 RPM PRESSURE DROP : 767 KPA #
#FLOW RATE :3363.96 L/MN HYDRAULIC POWER: 57.70 H.P #
#STAND PIPE PRESSURE: 3844 KPA #

****

GEOSERVICES — HAMMERHEAD #1 — DATE : 24/ 5/82

ON-LINE TDC

BIT #3 RUN #2 FP 12+0M BIT DIAMETER : 26.00 inch NOZZ 32/32/32 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	LAGGED	DRILLING PARAMETERS ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	tons	rpm	kNm	kPa	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	Hr	$/m
D	6:18	368.5	367.5	.0	22.4	3.1	75	2350	4132	3420	41.5	1.02	.00	14.6	.0	.19	.00	.0	.70	.00	.00	1.03	.70	173.5	7.92	351
D	6:20	369.1	368.1	.0	15.7	3.1	74	3073	4132	3403	41.5	1.02	.00	14.6	.0	.19	.00	.0	.73	.00	.00	1.03	.70	174.1	7.96	351
D	6:26	370.1	368.5	.0	37.0	3.5	74	2892	4132	3437	41.7	1.02	.00	14.6	.0	.19	.00	.0	.59	.00	.00	1.03	.70	174.5	8.05	350
D	6:30	371.1	369.5	.0	9.5	2.2	73	2531	4132	3403	41.9	1.02	.00	14.6	.0	.19	.00	.0	.80	.00	.00	1.03	.70	175.5	8.12	353
D	6:33	372.0	370.5	.0	24.5	2.7	73	2712	4132	3403	41.9	1.02	.00	14.6	.0	.19	.00	.0	.66	.00	.00	1.03	.70	176.5	8.16	352
D	6:36	373.0	372.0	.0	12.1	3.4	73	3073	4132	3403	42.1	1.02	.00	14.6	.0	.19	.00	.0	.82	.00	.00	1.03	.70	178.0	8.21	351
D	6:42	374.0	373.0	.0	11.3	3.2	73	2712	4132	3420	41.9	1.02	.00	14.6	.0	.19	.00	.0	.83	.00	.00	1.04	.70	179.0	8.30	353
D	6:50	375.1	374.1	.0	19.0	3.0	75	2712	4013	3364	47.8	1.02	.00	14.6	.0	.19	.00	.0	.70	.00	.00	1.04	.70	180.1	8.36	352
D	6:54	376.1	375.1	.0	10.4	2.4	76	3796	4013	3383	46.5	1.02	.00	14.6	.0	.19	.00	.0	.80	.00	.00	1.03	.70	181.0	8.44	353
D	7: 1	377.1	375.6	.0	13.3	3.3	76	3073	4013	3366	43.1	1.02	.00	14.5	.0	.19	.00	.0	.76	.00	.00	1.03	.70	181.5	8.55	353
D	7: 6	378.2	377.1	.0	14.0	1.3	75	2350	4013	3347	43.3	1.02	.00	14.5	.0	.19	.00	.0	.73	.00	.00	1.03	.70	183.0	8.63	355
D	7: 8	379.1	378.1	.0	18.0	3.4	76	2892	4013	3349	42.5	1.02	.00	14.5	.0	.19	.00	.0	.70	.00	.00	1.03	.70	184.1	8.67	354
D	7:12	380.1	379.1	.0	15.2	1.9	75	3977	4013	3366	41.7	1.02	.00	14.6	.0	.19	.00	.0	.74	.00	.00	1.03	.70	185.1	8.74	355
D	7:16	381.2	379.5	.0	11.1	1.9	75	2531	4013	3349	41.7	1.02	.00	14.6	.0	.19	.00	.0	.79	.00	.00	1.03	.70	185.5	8.81	355
D	7:23	382.0	380.5	.0	7.1	2.2	75	3073	4013	3349	42.9	1.02	.00	14.6	.0	.19	.00	.0	.89	.00	.00	1.03	.70	186.5	8.91	356
D	7:27	383.1	381.6	.0	11.5	1.8	76	2531	4013	3349	43.9	1.02	.00	14.6	.0	.19	.00	.0	.80	.00	.00	1.03	.70	187.6	8.98	357
D	7:39	384.2	382.5	.0	11.7	2.4	74	4519	4073	3383	45.5	1.02	.00	14.6	.0	.19	.00	.0	.42	.00	.00	1.03	.70	188.5	9.06	357
D	7:48	385.1	384.1	.0	7.1	2.7	76	2712	4102	3386	43.7	1.02	.00	14.6	.0	.19	.00	.0	.88	.00	.00	1.03	.70	190.0	9.22	360
D	7:52	386.2	385.1	.0	19.3	2.5	75	2892	4102	3383	44.5	1.02	.00	14.6	.0	.19	.00	.0	.70	.00	.00	1.03	.70	191.1	9.28	360
D	7:55	387.2	386.2	.0	19.4	2.9	77	3073	4102	3383	44.9	1.02	.00	14.6	.0	.19	.00	.0	.70	.00	.00	1.03	.70	192.1	9.33	360
D	8: 2	388.0	386.5	.0	5.6	3.0	77	2712	4102	3366	43.5	1.02	.00	14.6	.0	.19	.00	.0	.93	.00	.00	1.03	.70	192.5	9.44	361
D	8: 5	389.1	387.7	.0	22.3	2.0	77	3073	4102	3383	43.9	1.02	.00	14.6	.0	.19	.00	.0	.68	.00	.00	1.03	.70	193.7	9.50	361
D	8: 8	390.0	389.0	.0	17.4	3.1	76	2531	4102	3400	44.1	1.02	.00	14.6	.0	.19	.00	.0	.69	.00	.00	1.03	.70	195.0	9.55	361
D	8:13	391.1	390.1	.0	16.4	2.8	75	2892	4132	3386	42.1	1.02	.00	14.6	.0	.19	.00	.0	.73	.00	.00	1.03	.70	196.1	9.63	361
D	8:17	392.1	390.6	.0	11.0	.0	76	2892	4102	3383	41.9	1.02	.00	14.6	.0	.19	.00	.0	.80	.00	.00	1.03	.70	197.1	9.69	361
D	8:31	393.0	392.0	.0	11.6	2.0	82	2531	4132	3383	44.7	1.02	.00	14.6	.0	.19	.00	.0	.73	.00	.00	1.03	.72	198.0	9.88	363
D	8:37	394.1	392.6	.0	17.7	3.0	74	5785	4073	3366	42.9	1.02	.00	14.6	.0	.19	.00	.0	.70	.00	.00	1.03	.72	198.5	9.89	363
D	8:43	395.0	393.6	.0	10.7	2.9	75	3073	4102	3383	43.9	1.02	.00	14.6	.0	.19	.00	.0	.81	.00	.00	1.03	.72	199.5	9.99	364
D	8:48	396.1	395.1	.0	26.6	2.7	76	2892	4132	3373	44.5	1.02	.00	14.6	.0	.19	.00	.0	.65	.00	.00	1.03	.72	201.1	10.08	365
D	8:54	397.1	396.1	.0	12.3	2.2	78	2712	4132	3383	43.7	1.02	.00	14.6	.0	.19	.00	.0	.78	.00	.00	1.03	.72	202.1	10.18	366
D	8:58	398.0	396.7	.0	18.6	1.8	77	2712	4102	3383	43.5	1.02	.00	14.6	.0	.19	.00	.0	.71	.00	.00	1.03	.72	202.7	10.24	366
D	9: 5	399.0	398.0	.0	13.1	3.0	78	2531	4102	3383	44.1	1.02	.00	14.6	.0	.19	.00	.0	.80	.00	.00	1.03	.72	204.0	10.36	368
D	9:10	400.0	399.0	.0	16.4	2.9	75	3435	4132	3366	43.9	1.02	.00	14.6	.0	.19	.00	.0	.73	.00	.00	1.03	.72	205.0	10.45	369
D	9:23	401.2	400.1	.0	14.6	3.1	76	3977	4192	3400	45.9	1.02	.00	14.6	.0	.19	.00	.0	.64	.00	.00	1.03	.72	206.1	10.52	369
D	9:27	402.2	400.6	.0	21.4	2.6	80	2892	4222	3396	44.9	1.02	.00	14.6	.0	.19	.00	.0	.60	.00	.00	1.03	.72	206.5	10.58	369
D	9:31	403.1	402.0	.0	9.3	3.5	79	2892	4222	3415	44.5	1.02	.00	14.6	.0	.19	.00	.0	.88	.00	.00	1.03	.72	208.0	10.66	369
D	9:35	404.0	402.6	.0	14.2	2.3	80	3435	4222	3383	44.5	1.02	.00	14.6	.0	.19	.00	.0	.77	.00	.00	1.03	.72	208.6	10.71	369
D	9:40	405.1	403.6	.0	7.7	2.2	79	3616	4222	3383	43.9	1.02	.00	14.6	.0	.19	.00	.0	.89	.00	.00	1.03	.72	209.5	10.81	370
D	9:47	406.0	404.6	.0	7.0	2.7	80	3073	4222	3400	43.5	1.02	.00	14.6	.0	.19	.00	.0	.85	.00	.00	1.03	.72	210.5	10.91	371
D	9:51	407.1	405.6	.0	32.4	2.9	81	3073	4222	3383	43.7	1.02	.00	14.6	.0	.19	.00	.0	.65	.00	.00	1.03	.72	212.1	10.98	371

GEOSERVICES — HAMMERHEAD #1

ON-LINE TDC — DATE : 24/ 5/02

BIT #3 RUN #2 FP 12+0H — BIT DIAMETER : 26.00 inch — NOZZ 32/32/32 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	CCD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	tons	rpm	N*m	kPa	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	13:35	430.2	145.2	.0	10.6	4.1	70	3254	4252	3303	45.1	1.02	.00	14.8	.0	.19	.00	.0	.94	.00	.00	1.03	.53	232.2	12.81	385
D	13:39	431.0	146.1	.0	15.9	4.1	69	3073	4282	3393	44.9	1.02	.00	14.8	.0	.19	.00	.0	.81	.00	.00	1.03	.53	233.1	12.87	385
D	13:42	432.0	147.1	.0	21.4	4.3	68	3435	4252	3400	44.5	1.02	.00	14.8	.0	.19	.00	.0	.75	.00	.00	1.03	.53	234.1	12.92	385
D	13:58	433.0	147.7	.0	16.7	2.8	70	3435	4282	3381	43.9	1.02	.00	14.8	.0	.19	.00	.0	.80	.00	.00	1.03	.53	237.8	13.00	385
D	14:15	434.1	149.1	.0	24.9	1.4	73	2169	4312	3364	45.7	1.02	.00	14.8	.0	.19	.00	.0	.65	.00	.00	1.03	.53	239.3	13.03	379
D	14:16	435.1	149.7	.0	47.7	2.3	77	3254	4312	3383	45.1	1.02	.00	14.8	.0	.19	.00	.0	.45	.00	.00	1.03	.53	239.9	13.05	378
D	14:17	436.1	150.9	.0	74.4	3.7	76	3616	4312	3383	44.5	1.02	.00	14.8	.0	.19	.00	.0	.59	.00	.00	1.03	.53	241.3	13.07	377
D	14:25	437.0	151.6	.0	5.4	3.8	77	3435	4312	3393	43.9	1.02	.00	14.8	.0	.19	.00	.0	1.07	.00	.00	1.03	.53	241.8	13.19	378
D	14:28	438.0	152.8	.0	30.8	3.8	75	3616	4312	3383	43.5	1.02	.00	14.8	.0	.19	.00	.0	.69	.00	.00	1.03	.53	243.8	13.24	378
D	14:33	439.1	154.2	.0	13.5	3.9	78	3435	4342	3388	43.7	1.02	.00	14.8	.0	.19	.00	.0	.87	.00	.00	1.03	.53	244.3	13.33	378
D	14:38	440.0	155.1	.0	12.9	4.6	75	3435	4342	3381	43.7	1.02	.00	14.8	.0	.19	.00	.0	.88	.00	.00	1.03	.53	245.2	13.40	379
D	14:42	441.1	156.1	.0	16.6	4.0	78	3073	4342	3381	43.1	1.02	.00	14.8	.0	.19	.00	.0	.82	.00	.00	1.03	.53	246.3	13.46	378
D	14:57	442.1	156.6	.0	16.7	2.1	75	3435	4073	3293	47.6	1.02	.00	14.8	.0	.19	.00	.0	.82	.00	.00	1.03	.53	246.8	13.53	378
D	15: 3	443.0	158.1	.0	7.8	3.5	79	2892	4222	3325	47.9	.99	.00	14.9	.0	.19	.00	.0	.97	.00	.00	.99	.53	248.2	13.63	379
D	15: 8	444.0	158.6	.0	16.9	3.7	78	2892	4222	3347	46.8	.99	.00	14.9	.0	.19	.00	.0	.83	.00	.00	.99	.53	248.8	13.71	379
D	15:16	445.0	159.7	.0	7.4	3.0	79	2892	4222	3344	47.0	1.03	.00	14.9	.0	.19	.00	.0	.98	.00	.00	1.04	.53	250.2	13.84	381
D	15:24	446.0	161.1	.0	5.5	2.7	81	3073	4222	3324	44.9	1.07	.00	14.8	.0	.19	.00	.0	.92	.00	.00	1.08	.53	251.2	13.98	383
D	15:33	447.0	161.6	.0	7.3	2.4	80	3073	4222	3327	44.9	1.07	.00	14.8	.0	.19	.00	.0	.85	.00	.00	1.08	.53	251.8	14.12	384
D	15:40	448.1	163.1	.0	11.4	3.8	77	3073	4222	3339	44.7	1.05	.00	14.9	.0	.19	.00	.0	.85	.00	.00	1.06	.53	253.3	14.23	386
D	15:43	449.1	164.1	.0	19.7	3.5	77	2712	4222	3327	45.1	1.03	.00	14.9	.0	.19	.00	.0	.77	.00	.00	1.04	.53	254.3	14.27	385
D	15:46	456.6	164.1	.0	19.7	3.3	79	2531	4222	3310	44.9	1.03	.00	14.9	.0	.19	.00	.0	.77	.00	.00	1.04	.53	254.3	14.32	385

GEOSERVICES — HAMMERHEAD #1 — DATE : 24/ 5/82

BIT #3 RUN #2 FP 12+0H — BIT DIAMETER : 26.00 inch — NOZZ 32/32/32 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	tons	rpm	Nm	kPa	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	17:42	465.2	462.4	.0	16.4	5.5	65	3977	4162	3310	44.1	1.06	.00	14.9	.0	.19	.00	.0	.74	.00	.00	1.07	.78	269.8	17.06	423
D	17:45	466.1	462.9	.0	21.4	5.5	64	4081	4162	3293	43.9	1.06	.00	14.9	.0	.19	.00	.0	.68	.00	.00	1.08	.78	270.3	17.11	423
D	18: 3	467.1	464.5	.0	6.6	4.9	63	3616	4202	3344	46.7	1.06	.00	14.9	.0	.19	.00	.0	.87	.00	.00	1.07	.78	271.8	17.24	424
D	18: 7	468.0	465.0	.0	13.4	6.3	62	5062	4252	3312	45.5	1.06	.00	14.9	.0	.19	.00	.0	.77	.00	.00	1.07	.78	272.3	17.30	424
D	18:11	469.2	466.8	.0	16.1	5.1	62	3616	4202	3327	44.5	1.06	.00	14.9	.0	.19	.00	.0	.76	.00	.00	1.07	.78	273.3	17.37	424
D	18:17	470.0	467.0	.0	10.0	5.0	61	3977	4252	3329	44.3	1.04	.00	14.9	.0	.19	.00	.0	.83	.00	.00	1.05	.78	274.3	17.47	424
D	18:18	479.0	477.2	.0	3948	6.1	61	4158	4202	3329	44.3	1.06	.00	14.9	.0	.19	.00	.0	.29	.00	.00	1.07	.77	284.6	17.49	418
D	19:24	480.0	480.2	.0	10.8	4.8	64	3254	4312	3327	47.0	1.03	.00	14.9	.0	.19	.00	.0	.00	.00	.00	1.04	.77	284.6	17.80	415
D	19:30	481.1	481.7	.0	11.9	3.7	65	3873	4312	3327	45.9	1.03	.00	14.9	.0	.19	.00	.0	.81	.00	.00	1.04	.77	286.1	17.91	416
D	19:34	482.0	482.2	.0	19.3	5.4	65	3616	4312	3327	45.5	1.04	.00	14.9	.0	.19	.00	.0	.71	.00	.00	1.05	.77	286.6	17.96	416
D	19:39	483.1	483.7	.0	10.2	3.8	65	3796	4312	3347	45.1	1.05	.00	14.9	.0	.19	.00	.0	.81	.00	.00	1.06	.78	288.1	18.04	416
D	19:51	484.0	484.1	.0	9.5	4.8	64	4081	4312	3347	46.3	1.06	.00	14.9	.0	.19	.00	.0	.78	.00	.00	1.07	.78	288.5	18.13	417
D	19:57	485.1	485.1	.0	9.5	3.7	64	3616	4342	3347	45.5	1.03	.00	14.9	.0	.19	.00	.0	.84	.00	.00	1.04	.78	289.5	18.23	417
D	20: 1	486.1	486.2	.0	28.4	4.6	62	3616	4342	3344	45.1	1.03	.00	14.9	.0	.19	.00	.0	.66	.00	.00	1.04	.78	290.5	18.31	417
D	20: 7	487.1	487.7	.0	14.3	4.8	62	3796	4342	3327	45.1	1.03	.00	14.9	.0	.19	.00	.0	.76	.00	.00	1.04	.78	292.0	18.41	418
D	20:16	488.0	488.2	.0	5.3	.0	62	2892	4342	3347	45.1	1.03	.00	14.9	.0	.19	.00	.0	.96	.00	.00	1.04	.78	292.5	18.55	419
D	20:23	489.2	489.9	.0	19.0	4.1	63	3254	4372	3329	44.9	1.03	.00	14.9	.0	.19	.00	.0	.70	.00	.00	1.04	.78	294.2	18.67	420
D	20:37	490.1	487.8	.0	6.5	4.6	62	3435	3983	2092	45.9	1.04	.00	14.9	.0	.19	.00	.0	.91	.00	.00	1.04	.78	294.6	18.80	421
D	20:46	494.0	490.1	.0	2.8	4.8	59	3435	4192	3261	40.8	1.04	.00	14.9	.0	.19	.00	.0	1.88	.00	.00	1.05	.78	299.8	18.93	418
D	20:53	495.1	495.1	.0	10.7	7.1	65	3796	4162	3265	46.8	1.03	.00	14.9	.0	.19	.00	.0	.86	.00	.00	1.04	.78	300.1	19.03	419
D	20:56	496.0	495.5	.0	14.6	6.0	64	4158	4132	3258	46.7	1.03	.00	14.9	.0	.19	.00	.0	.78	.00	.00	1.04	.78	301.0	19.09	419
D	21: 1	497.1	497.1	.0	13.6	6.9	64	4339	4162	3268	44.3	1.03	.00	14.9	.0	.19	.00	.0	.82	.00	.00	1.04	.78	302.0	19.17	419
D	21: 7	498.0	498.1	.0	9.4	6.4	65	4339	4192	3255	40.3	1.03	.00	14.9	.0	.19	.00	.0	.90	.00	.00	1.04	.78	303.0	19.28	419
D	21:12	499.1	499.1	.0	12.6	4.5	65	3977	4162	3255	37.1	1.06	.00	14.9	.0	.19	.00	.0	.80	.00	.00	1.07	.78	304.1	19.36	420
D	21:18	500.1	499.6	.0	11.2	5.8	64	3616	4192	3275	34.5	1.03	.00	14.9	.0	.19	.00	.0	.79	.00	.00	1.04	.79	304.5	19.45	420
D	21:26	501.1	500.6	.0	9.2	5.9	65	3254	4192	3275	34.9	1.03	.00	14.9	.0	.19	.00	.0	.88	.00	.00	1.04	.79	305.5	19.58	420
D	21:39	502.0	501.5	.0	2.8	5.8	63	4780	4282	3268	44.9	1.03	.00	14.9	.0	.19	.00	.0	1.13	.00	.00	1.04	.79	306.5	19.80	423
D	21:54	503.1	503.1	.0	17.8	7.7	52	4339	4582	3300	45.5	1.03	.00	14.9	.0	.19	.00	.0	.73	.00	.00	1.04	.79	308.1	19.92	425
D	22: 1	504.1	503.7	.0	9.8	4.3	65	4519	4582	3392	44.7	1.03	.00	14.8	.0	.19	.00	.0	.88	.00	.00	1.04	.79	308.6	20.03	425
D	22: 7	505.0	505.1	.0	7.7	4.3	63	3616	4582	3366	44.3	1.03	.00	14.9	.0	.19	.00	.0	.86	.00	.00	1.04	.79	310.0	20.13	426
D	22:19	506.0	506.0	.0	4.5	5.9	62	3616	4552	3348	44.5	1.03	.00	14.9	.0	.19	.00	.0	.99	.00	.00	1.04	.79	311.0	20.32	428
D	22:24	507.2	506.6	.0	11.1	5.4	62	4158	4552	3371	44.3	1.03	.00	14.9	.0	.19	.00	.0	.83	.00	.00	1.04	.79	311.5	20.41	428
D	22:30	508.1	508.1	.0	7.4	4.4	65	2712	4582	3366	44.7	1.03	.00	14.9	.0	.19	.00	.0	.89	.00	.00	1.04	.79	313.0	20.50	429
D	22:37	509.0	508.5	.0	7.8	5.6	62	3873	4582	3380	45.1	1.03	.00	14.9	.0	.19	.00	.0	.87	.00	.00	1.04	.79	313.5	20.63	429
D	22:47	510.0	509.6	.0	5.0	4.4	63	3435	4582	3361	45.1	1.03	.00	14.9	.0	.19	.00	.0	.99	.00	.00	1.04	.79	314.5	20.79	431
D	23: 1	516.3	516.3	.0	490.	4.4	52	3254	4282	3258	48.4	1.03	.00	14.9	.0	.19	.00	.0	.18	.00	.00	1.04	.00	321.3	20.97	425
D	23: 7	513.0	512.2	.0	15.4	4.6	63	3073	4282	3295	46.7	1.03	.00	14.9	.0	.19	.00	.0	.74	.00	.00	1.04	.79	317.2	20.98	430
D	23:20	514.2	513.2	.0	4.9	5.4	64	3254	4342	3298	45.5	1.03	.00	14.9	.0	.19	.00	.0	.96	.00	.00	1.04	.79	318.2	21.11	430
D	23:28	515.1	514.7	.0	17.8	4.9	64	3977	4342	3276	45.5	1.03	.00	14.9	.0	.19	.00	.0	.74	.00	.00	1.04	.79	319.7	21.23	433
D	23:33	516.0	515.7	.0	7.9	4.6	63	3796	4342	3293	45.5	1.03	.00	14.9	.0	.19	.00	.0	.88	.00	.00	1.04	.79	320.7	21.31	433
D	23:37	517.0	516.7	.0	13.3	5.2	64	3977	4342	3295	45.5	1.03	.00	14.9	.0	.19	.00	.0	.88	.00	.00	1.04	.00	321.7	21.39	434
D	23:42	518.0	517.2	.0	4.9	5.6	63	3796	4372	3293	44.3	1.03	.00	14.9	.0	.19	.00	.0	.99	.00	.00	1.04	.00	322.2	21.63	435
D	23:58	519.1	518.2	.0	11.2	5.3	64	3977	4342	3295	44.1	1.03	.00	14.9	.0	.19	.00	.0	.84	.00	.00	1.04	.00	323.2	21.74	437
D	0: 3	520.0	519.2	.0	15.8	4.9	64	3796	4372	3278	44.1	1.03	.00	14.9	.0	.19	.00	.0	.77	.00	.00	1.04	.00	324.2	21.81	437
D	0:10	521.1	520.7	.0	7.4	5.4	63	3616	4372	3295	43.5	1.03	.00	14.9	.0	.19	.00	.0	.93	.00	.00	1.04	.00	325.7	21.93	438
D	0:25	522.0	521.2	.0	10.7	.0	64	3254	4552	3347	44.1	1.03	.00	14.9	.0	.19	.00	.0	.85	.00	.00	1.04	.00	326.2	21.98	438
D	0:29	523.0	522.3	.0	51.2	4.2	64	3435	4552	3329	43.5	1.03	.00	14.9	.0	.19	.00	.0	.53	.00	.00	1.04	.00	327.3	22.04	437
D	0:33	524.0	523.6	.0	19.2	4.9	64	3435	4552	3329	43.3	1.03	.00	14.9	.0	.19	.00	.0	.68	.00	.00	1.04	.00	328.6	22.10	437
D	0:37	525.1	524.7	.0	19.5	4.5	63	3616	4552	3312	43.1	1.03	.00	14.9	.0	.19	.00	.0	.78	.00	.00	1.04	.00	329.7	22.17	437

GEOSERVICES — HAMMERHEAD #1 — DATE : 25/ 5/02

ON-LINE TDC

BIT #3 RUN #2 FP 12+0H BIT DIAMETER : 26.00 inch NOZZ 32/32/32 MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY WORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	tons	rpm	N*m	kPa	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	D/Hr	$/m
D	0:44	526.2	525.8	.0	8.6	4.1	64	3616	4552	3346	43.1	1.03	.00	15.8	.0	.19	.00	.0	.86	.00	.00	1.04	.00	330.8	22.28	437
D	0:53	527.0	526.2	.0	15.4	5.5	64	3977	4552	3383	42.9	1.03	.00	15.8	.0	.19	.00	.0	.74	.00	.00	1.04	.00	331.2	22.45	432
D	0:58	528.1	527.1	.0	13.3	4.2	66	4158	4552	3329	42.9	1.03	.00	14.9	.0	.19	.00	.0	.80	.00	.00	1.04	.00	332.1	22.52	439
D	1: 5	529.1	528.4	.0	8.4	4.7	64	3977	4552	3329	42.9	1.03	.00	14.9	.0	.19	.00	.0	.88	.00	.00	1.04	.00	333.4	22.64	439
D	1:11	530.1	529.7	.0	7.7	4.9	64	3977	4552	3347	42.9	1.03	.00	15.8	.0	.19	.00	.0	.89	.00	.00	1.04	.00	334.7	22.74	440
D	1:29	531.1	530.2	.0	7.5	4.1	65	3977	4432	3276	45.7	1.03	.00	14.9	.0	.19	.00	.0	.91	.00	.00	1.04	.00	335.2	22.89	441
D	1:35	532.0	531.2	.0	8.1	4.2	65	3073	4432	3298	44.1	1.03	.00	14.9	.0	.19	.00	.0	.88	.00	.00	1.04	.00	336.6	23.00	442
D	1:43	533.1	532.2	.0	6.7	4.2	65	3254	4462	3318	43.7	1.03	.00	14.9	.0	.19	.00	.0	.92	.00	.00	1.04	.00	337.7	23.12	443
D	1:49	534.0	533.7	.0	9.4	4.6	65	3616	4462	3276	43.1	1.03	.00	14.9	.0	.19	.00	.0	.85	.00	.00	1.04	.01	338.7	23.23	443
D	1:58	535.1	534.2	.0	6.7	4.6	65	2531	4492	3293	43.1	1.03	.00	14.9	.0	.19	.00	.0	.87	.00	.00	1.04	.01	339.7	23.37	444
D	2: 0	536.1	535.7	.0	5.3	4.7	65	3073	4522	3325	43.3	1.03	.00	14.9	.0	.19	.00	.0	.96	.00	.00	1.04	.01	340.7	23.54	446
D	2:17	537.0	536.2	.0	9.7	4.9	65	3254	4522	3293	43.3	1.03	.00	14.9	.0	.19	.00	.0	.84	.00	.00	1.04	.01	341.2	23.69	446

GEOSERVICES — HAMMERHEAD #1 — DATE : 25/ 5/02

ON-LINE TDC

BIT #3 RUN #2 FP 12+0M BIT DIAMETER : 26.00 inch NOZZ 32/32/32 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 9 GEL = 8

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	DRILLING PARAMETERS ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/Hr	tons	rpm	NMm	kPa	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
T	4:39	541.8	459.9	.0	——	——	63	3073	4522	3327	43.9	1.03	.00	14.9	.0	.19	.00	.0	——	——	——	——	——	——	——	——
D	4:56	543.1	462.3	.0	5.0	5.4	63	4158	4522	3327	44.1	1.03	.00	14.9	.0	.19	.00	.0	.98	.00	.00	1.04	.76	348.4	17.33	332
D	5: 4	544.2	463.3	.0	6.9	4.0	63	3796	4522	3327	44.3	1.03	.00	14.9	.0	.19	.00	.0	.89	.00	.00	1.04	.76	349.4	17.47	333
D	5:16	545.1	464.3	.0	4.9	5.7	63	2092	4552	3327	44.1	1.03	.00	14.9	.0	.19	.00	.0	.99	.00	.00	1.04	.76	350.4	17.67	335
D	5:34	546.1	465.3	.0	3.6	3.0	64	2712	4552	3332	44.1	1.03	.00	14.8	.0	.19	.00	.0	1.01	.00	.00	1.04	.76	351.4	29.46	530
D	5:46	547.2	545.9	.0	5.0	5.1	64	2531	4522	3318	43.9	1.03	.00	14.8	.0	.19	.00	.0	.96	.00	.00	1.04	.81	352.4	29.65	532
D	6: 7	548.2	547.0	.0	2.9	6.2	63	2531	4492	3330	44.1	1.04	.00	14.8	.0	.19	.00	.0	1.09	.00	.00	1.04	.81	353.4	30.01	536

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

25/ 5/82 TIME 6:35

HAMMERHEAD #1

DEPTH OF EXECUTION	549.86 METERS			
FLOW RATE	3366 L/MN			POWER LAW
MUD DATA	WEIGHT	1.02 SG		
	PV	3 CPS		
	YP	.10 LB/FT2		
	GEL	.10 LB/100 FT2		
	N	1.0000		
	K	.0059 LB/100 FT2		
HOLES VOLUMES	WITH PIPES	157.77 M3		
	WITHOUT PIPES	162.21 M3		
	ANNULAR	153.11 M3		
	INSIDE PIPES	4.65 M3		

	FROM	TO	PIPE ID	PIPE OD	HOLE DIAM	P.LOSSES	H.P	TYPE	CRITICAL FLOW	MUD VELOCITY	CUTTINGS VELOCITY
	METERS		INCH	INCH	INCH	KPA			L/MN	M/MN	M/MN
SURF.EQPT						632	40				
DR.STRING	.00	461.00	4.28	5.00		1055	79				
DR.STRING	461.00	517.68	2.81	7.75		969	73				
DR.STRING	517.68	551.89	3.00	9.50		429	32				
BIT						770	50	M/S		36.9	
ANNULUS	549.86	514.85	9.50	26.00		0	0	TU	352.0	11.3	3.9
ANNULUS	514.85	458.17	7.75	26.00		0	0	TU	334.7	10.8	3.4
ANNULUS	458.17	194.00	5.00	26.00		0	0	TU	307.4	10.2	2.8
ANNULUS	194.00	143.00	5.00	28.00		0	0	TU	327.2	8.8	1.4
ANNULUS	143.00	.00	5.00	16.75		1	0	TU	215.7	26.0	18.6
TOTAL						3856	298				

ANNULAR PRESSURE LOSSES	1 KPA	
EQUIV.CIRCULATING DENSITY	1.02 SG	
MAX DEPTH	5775.90	
MUD LAG TIMES	S -> B	1.38 MN
	B -> S	45.49 MN
CUTTINGS DATA	SIZE	.20 CM
	DENSITY	2.40 SG
	LAG TIME	164.5 MN
	MAX SLIP VELOCITY	7.39 M/MN
BIT DATA	SIZE	26.00 INCH
	NOZZLES	32 32 32 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	770 KPA
	H.H.P RATIO	19.96 %
	BIT H.H.P	.189
	BIT VELOCITY	36.93 M/S

ON-LINE TDC
GEOSERVICES BIT REPORT

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* 25/ 5/82 HAMMERHEAD #1
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**********
#BIT HEADING  :BIT #3 RUN #2
#BIT TYPE     :TOOTH                                    #
#BIT IDENTITY :FP 12+ON                                 #
**********
#BIT SIZE     :   26.00 INCH                            #
#BIT COST     :  3000.   $              RIG COST/HR:  5833.   #
**********
#NOZZLES      :  32 32 32 /32NDS  @  95 % EFFICIENCY    #
**********
#DEPTH IN     :  193.90 METERS          23/ 4/82        #
#DEPTH OUT    :  549.86 METERS          25/ 5/82        #
#METRAGE      :  355.00 METERS                          #
#TOTAL REVOLUTIONS :     0                              #
**********
#DRILLING TIME:   30:14 HR              AVERAGE ROP:  11.74 M/HR  #
#TIME IN HOLE :   35:52 HR              AVERAGE ROP:   9.90 M/HR  #
#TRIP TIME    :    2: 0 HR                             #
**********
#DRILLING COST STANDARD  :  630.5 $/MET                 #
#DRILLING COST ON BOTTOM :  538.1 $/MET                 #
#DRILLING COST MINIMUM   :  335.5 $/MET                 #
**********
#    AVERAGE OVER THE RUN              AVERAGE HYDRAULICS    #
#WEIGHT ON BIT      :  4.89 TONS    NOZZLES SPEED  :  36.43 M/S  #
#ROTATION           :  66.00 RPM    PRESSURE DROP  :   749 KPA   #
#FLOW RATE          :3320.63 L/MN   HYDRAULIC POWER:  55.61 H.P  #
#STAND PIPE PRESSURE:  4262 KPA                         #
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GEOSERVICES — HAMMERHEAD #1 — DATE : 25/ 5/82

ON-LINE TDC

BIT #3 RUN #2 FP 12+0M BIT DIAMETER : 26.00 inch NOZZ 32/32/32 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 0 GEL = 0

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	DRILLING PARAMETERS ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	tons	rpm	kNm	kPa	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	7: 5	350.1	348.9	.0	1.0	6.9	62	2531	4402	3270	47.6	1.03	.00	14.8	.0	.19	.00	.0	1.26	.00	.00	1.04	.81	356.1	30.52	541
T	7:35	350.5	349.4	.0	----	----	61	2169	4402	3290	45.3	1.03	.00	14.8	.0	.19	.00	.0	----		----			----		
T	8: 5	350.5	349.4	.0	----	----	58	2531	5720	3749	42.1	1.03	.00	14.8	.0	.19	.00	.0	----		----			----		
D	8:21	351.1	349.9	.0	.6	3.8	63	4881	5839	3739	39.3	1.05	.00	14.8	.0	.19	.00	.0	1.30	.00	.00	1.06	.81	357.0	31.62	557
D	8:45	352.1	350.9	.0	1.9	4.0	67	2350	5839	3771	35.3	1.06	.00	14.8	.0	.19	.00	.0	.81	.00	.00	1.07	.82	358.0	31.94	561
D	8:56	353.1	351.9	.0	4.9	5.3	64	4519	5839	3793	33.1	1.07	.00	14.8	.0	.19	.00	.0	.97	.00	.00	1.08	.82	359.1	32.13	562
D	9: 4	354.1	352.5	.0	6.0	4.8	63	5243	5839	3766	31.9	1.04	.00	14.8	.0	.19	.00	.0	.90	.00	.00	1.04	.82	359.6	32.26	563
D	9:10	355.1	353.9	.0	7.5	5.7	63	4881	5839	3776	30.9	1.03	.00	14.8	.0	.19	.00	.0	.91	.00	.00	1.05	.82	361.0	32.35	563
D	9:19	356.2	355.0	.0	6.2	5.7	64	4881	5869	3756	29.5	1.03	.00	14.8	.0	.19	.00	.0	.94	.00	.00	1.05	.82	362.1	32.50	564
D	9:25	357.2	355.9	.0	8.7	6.0	65	4519	5869	3793	28.7	1.03	.00	14.8	.0	.19	.00	.0	.87	.00	.00	1.04	.82	363.0	32.60	564
D	9:39	358.2	357.0	.0	5.7	4.0	65	5423	5840	3678	39.3	1.04	.00	14.8	.0	.19	.00	.0	.97	.00	.00	1.04	.82	364.1	32.77	565
D	9:43	359.2	358.0	.0	13.6	5.0	64	4700	5688	3700	39.1	1.04	.00	14.8	.0	.19	.00	.0	.77	.00	.00	1.04	.82	365.1	32.83	565
D	9:48	360.3	358.9	.0	13.2	4.6	64	5243	5630	3665	38.7	1.03	.00	14.8	.0	.19	.00	.0	.80	.00	.00	1.04	.82	366.1	32.92	564
D	9:53	361.1	359.9	.0	11.1	4.5	65	3977	5630	3663	38.3	1.03	.00	14.8	.0	.19	.00	.0	.82	.00	.00	1.04	.82	367.1	33.00	564
D	10: 3	362.1	361.0	.0	5.0	5.2	65	3977	5630	3680	37.7	1.03	.00	14.8	.0	.19	.00	.0	1.01	.00	.00	1.04	.82	368.1	33.17	565
D	10:18	363.1	361.9	.0	7.1	5.7	65	4158	5630	3665	37.3	1.03	.00	14.8	.0	.19	.00	.0	.92	.00	.00	1.04	.82	369.1	33.30	566
T	10:48	363.4	361.9	.0	----	----	63	2169	5600	3663	34.9	1.07	.00	14.8	.0	.19	.00	.0	----		----			----		
T	11:18	363.4	361.9	.0	----	----	0	542	5540	3665	32.5	1.08	.00	14.8	.0	.19	.00	.0	----		----			----		
D	11:17	365.0	361.9	.0	7.1	.0	0	542	5570	3700	32.3	1.04	.00	14.8	.0	.19	.00	.0	.92	.00	.00	1.04	.82	369.1	33.89	566

ON-LINE TDC
GEOSERVICES BIT REPORT

* 25/ 5/82 HAMMERHEAD #1

#BIT HEADING :BIT #3 RUN #2
#BIT TYPE :TOOTH
#BIT IDENTITY :FP 12+ON
#BIT SIZE : 26.00 INCH
#BIT COST : 3000. $ RIG COST/HR: 5033.
#NOZZLES : 32 32 32 /32NDS @ 95 % EFFICIENCY
#DEPTH IN : 194.00 METERS 23/ 4/82
#DEPTH OUT : 565.00 METERS 25/ 5/82
#METRAGE : 371.00 METERS
#TOTAL REVOLUTIONS : 22
#DRILLING TIME: 33:54 HR AVERAGE ROP: 10.95 M/HR
#TIME IN HOLE : 40:39 HR AVERAGE ROP: 9.13 M/HR
#TRIP TIME : 2: 0 HR
#DRILLING COST STANDARD : 678.7 $/MET
#DRILLING COST ON BOTTOM : 572.4 $/MET
#DRILLING COST MINIMUM : 335.5 $/MET

* AVERAGE OVER THE RUN AVERAGE HYDRAULICS
#WEIGHT ON BIT : 5.18 TONS NOZZLES SPEED : 36.37 M/S
#ROTATION : 66.33 RPM PRESSURE DROP : 755 KPA
#FLOW RATE :3315.37 L/MN HYDRAULIC POWER: 55.95 H.P
#STAND PIPE PRESSURE: 4288 KPA

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

* 25/ 5/82 TIME 11:55 HAMMERHEAD #1

* DEPTH OF EXECUTION 565.00 METERS
* FLOW RATE 3340 L/MN POWER LAW

MUD DATA	WEIGHT	1.02	SG
	PV	3	CPS
	YP	.10	LB/FT2
	GEL	.10	LB/100 FT2
	N	1.0000	
	K	.0059	LB/100 FT2
HOLES VOLUMES	WITH PIPES	163.20	M3
	WITHOUT PIPES	167.67	M3
	ANNULAR	158.37	M3
	INSIDE PIPES	4.83	M3

	FROM	TO	PIPE ID	PIPE OD	HOLE DIAM	P.LOSSES KPA		H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
	METERS		INCH	INCH	INCH	KPA				L/MN	M/MN	M/MN
SURF.EQPT						623	47					
DR.STRING	.00	479.44	4.28	5.00		1082	81					
DR.STRING	479.44	536.12	2.81	7.75		955	71					
DR.STRING	536.12	570.33	3.00	9.50		423	32					
BIT						758	57	M/S		36.6		
ANNULUS	565.00	538.79		9.50	26.00	0	0	TU	352.8	11.3	3.9	
ANNULUS	538.79	474.11		7.75	26.00	0	0	TU	334.7	10.7	3.3	
ANNULUS	474.11	194.00		5.10	26.00	0	0	TU	307.4	10.1	2.7	
ANNULUS	194.00	143.00		5.00	28.00	0	0	TU	327.2	8.7	1.3	
ANNULUS	143.00	.00		5.00	16.75	1	0	TU	215.7	25.6	18.4	
TOTAL						3843	287					

ANNULAR PRESSURE LOSSES 1 KPA

EQUIV.CIRCULATING DENSITY 1.02 SG
MAX DEPTH 5929.06

MUD LAG TIMES	S -) B	1.44	MN
	B -) S	47.42	MN
CUTTINGS DATA	SIZE	.20	CM
	DENSITY	2.40	SG
	LAG TIME	175.7	MN
	MAX SLIP VELOCITY	7.39	M/MN
BIT DATA	SIZE	26.00	INCH
	NOZZLES	32 32 32	/32NDS
	NOZZLES EFFICIENCY	75	%
	BIT P. LOSSES	758	KPA
	H.H.P RATIO	19.72	%
	BIT H.H.P	.107	
	BIT VELOCITY	36.64	M/S

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

31/ 5/82 — HAMMERHEAD 1

BIT RUN # 11 — SEQ NBR: 7

STARTING DEPTH 582.00 METERS

BIT DATA — SIZE 12.25 / TOOTH HTC J4 / NOZZLES 13 13 13 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	54	9.20	4.28	5.00	29.02
2	DRILL COLLAR	1	59.00	2.81	7.75	207.00

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	18.75	143.00	554.00
OPEN HOLE 1	12.25	554.00	594.64

COST DATA — BIT COST 3500 $ / RIG COST 5833 $/HR / TRIP TIME 4.00 HRS

WEIGHTS — HOOK LOAD OFF BOTTOM 66.6 TONS / STRING WEIGHT IN AIR 26.6 TONS

VOLUMES — ANNULUS 87.2 M3 / IN PIPES 5.1 M3

DEVIATION — .5 DEG .873 M / 100 M

HYDRAULICS — NOMINAL ANNULUS PRESSURE LOSSES AT 10 BBL/MN : 4.0 KG/CM2

BIT WEAR — TYPE EXPONENT 5.0 / EXPECTED: RUN LENGTH 120 METERS TEETH WEAR 4 /8TH

T	-15:38	582.0	579.8	571.8	*472.7	.0	0	53	-0	0	89	60.1	.78	1.03	.65	27.6	27.9	15.0	.30	.27	2.95	3.6	-1.94	.82	.24	1.03	.98	1.46	.0	.0	2115.7		
	15:40	585.6	579.0	581.9	*472.7	.0	60	178	168	2709	2709	62.3	1.07	1.03	1.34	20.8	20.8	25.8	.30	.29	.30	4.8	-1.94	.82	.24	1.03	1.27	1.46	.0	.0	2115.7		
	15:44	586.1	583.1	566.0	6.3	1.5	67	178	170	2711	5288	65.1	1.07	1.05	1.31	20.6	20.8	25.6	.30	.30	.31	4.8	.65	.82	.32	1.30	1.27	1.62	4.1	.0	6675.2		
	15:47	587.1	584.1	566.0	23.3	6.7	67	178	169	2714	3425	65.7	1.04	1.05	1.29	21.0	20.8	25.7	.30	.30	.31	3.6	.59	.82	.44	1.39	1.24	1.68	5.1	.1	5407.6		
	15:52	588.1	584.5	566.3	15.1	5.2	67	196	167	2696	1364	65.9	1.05	1.05	1.31	21.1	20.8	25.3	.31	.30	.31	3.6	.67	.82	.47	1.27	1.25	1.61	5.5	.2	4980.6		
	16: 6	591.0	585.5	566.6	11.9	.0	64	143	170	2734	247	68.7	1.02	1.05	1.33	21.4	20.8	26.2	.31	.30	.31	4.8	.24	.82	.35	1.03	1.22	1.46	9.0	.3	3151.8		
T	16:26	591.3	588.0	567.8	38.7	3.7	65	143	170	2752	2663	65.3	1.05	1.05	1.32	22.0	20.9	27.1	.30	.30	.31	3.6	.24	.82	.35	1.03	1.25	1.46	9.0	.6	3151.8		
T	16:46	591.4	588.0	570.9	38.7	10.6	20	125	171	2752	1597	64.7	1.05	1.05	1.31	22.6	21.0	27.4	.31	.30	.31	4.8	.24	.82	.35	1.03	1.26	1.46	9.0	.9	3151.8		
T	17: 6	591.5	588.0	573.9	38.7	-1.7	28	107	172	2742	3453	64.1	1.06	1.05	1.32	23.1	21.3	28.4	.31	.30	.30	4.8	.24	.82	.35	1.03	1.26	1.46	9.0	1.2	3151.8		
T	17:26	591.5	588.0	591.3	38.7	-2.4	29	107	166	2747	1948	64.3	1.06	1.05	1.30	23.0	22.6	29.0	.30	.30	.31	4.8	.24	.82	.35	1.03	1.25	1.46	9.0	1.5	3151.8		
T	17:46	591.5	588.5	591.3	.4	5.4	33	125	171	2752	2752	64.1	1.05	1.05	1.31	24.3	23.2	29.6	.31	.30	.30	4.8	1.20	.82	.80	1.03	1.25	1.46	9.5	1.8	3847.2		
T	18: 6	591.5	588.5	591.3	.4	.0	29	107	106	2134	4267	66.3	1.02	1.05	1.30	24.7	23.8	29.5	.31	.30	.31	6.0	1.20	.82	.80	1.03	1.14	1.46	9.5	2.1	3847.2		
T	18:26	591.6	588.5	591.3	.4	7.0	64	160	171	2770	5702	66.5	1.00	1.05	.65	25.0	24.3	25.8	.31	.30	2.95	4.8	1.20	.82	.80	1.03	1.21	1.46	9.5	2.3	3847.2		
T	18:46	592.0	588.5	591.3	.4	7.5	58	143	165	2697	2943	65.9	1.00	1.05	1.30	25.4	24.7	29.7	.30	.30	.30	6.0	1.20	.82	.80	1.03	1.20	1.46	9.5	2.7	3847.2		
	18:51	592.0	589.0	591.3	.4	6.8	58	143	165	2735	2735	65.7	1.00	1.05	1.30	25.4	24.7	30.1	.30	.30	.30	4.8	1.20	.82	.80	1.03	1.20	1.46	10.0	2.7	4277.9		
T	19:11	592.0	589.0	591.6	.4	.0	0	53	-7	0	****	67.5	.85	1.00	1.28	25.4	25.0	30.9	.30	.30	.30	4.8	1.20	.82	.80	1.03	.85	1.46	10.0	2.9	4277.9		

ON-LINE TDC
GEOSERVICES

BIT REPORT

* 31/ 5/82 HAMMERHEAD 1 *

*BIT HEADING :BIT RUN # 11 *
*BIT TYPE :TOOTH *
*BIT IDENTITY :HTC J4 *

*BIT SIZE : 12.25 INCH *
*BIT COST : 3500. $ RIG COST/HR: 5833. *

*NOZZLES : 13 13 13 /32NDS @ 95 % EFFICIENCY *

*DEPTH IN : 582.00 METERS 31/ 5/82 *
*DEPTH OUT : 592.01 METERS 31/ 5/82 *
*METRAGE : 10.01 METERS *
*TOTAL REVOLUTIONS : 8 *

*DRILLING TIME: 2:53 HR AVERAGE ROP: 3.48 m/hr *
*TIME IN HOLE : 3:35 HR AVERAGE ROP: 2.79 m/hr *
*TRIP TIME : 4: 0 HR *

*DRILLING COST STANDARD : 4773.1 $/MET *
*DRILLING COST ON BOTTOM : 4358.7 $/MET *
*DRILLING COST MINIMUM : 3151.8 $/MET *

* AVERAGE OVER THE RUN AVERAGE HYDRAULICS *
*WEIGHT ON BIT : 6.15 TONS NOZZLES SPEED : 167.26 M/S *
*ROTATION : 55.99 RPM PRESSURE DROP : 167.31 K/CM2 *
*FLOW RATE :2515.96 L/MN HYDRAULIC POWER: 922.79 H.P *
*STAND PIPE PRESSURE: 155.32 K/CM2 *

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

* 31/ 5/82 21:55 HAMMERHEAD 1 *

* DEPTH OF EXECUTION 592.01 METERS SIMULATION *
* FLOW RATE 2710 L/MN BINGHAM *
*

* MUD DATA	WEIGHT	1.06	KG/L
* ————	PV	4	CPS
*	YP	6.00	
*	GEL	3.00	
*	N	.6521	
*	K	.1199	
*			
* HOLES VOLUMES	WITH PIPES	93.06	M3
* ————	WITHOUT PIPES	96.43	M3
*	ANNULAR	87.80	M3
*	INSIDE PIPES	5.18	M3

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES K/C	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						5.3	32				
DR.STRING	.00	533.10	4.28	5.00		9.9	59				
DR.STRING	533.10	592.10	2.81	7.75		8.2	49				
*BIT *						194.1	1153	M/S		188.2	
*ANNULUS *	592.01	554.00		7.75	12.25	.0	0	TU	2354.5	59.4	59.4
*ANNULUS *	554.00	533.01		7.75	10.75	.0	0	LA	7447.9	10.3	10.3
*ANNULUS *	533.01	143.00		5.00	10.75	.1	1	LA	8316.4	16.4	16.4
*ANNULUS *	143.00	.00		5.50	16.75	.1	0	LA	6522.8	20.9	20.9
* TOTAL*						217.0	1294				

*ANNULAR PRESSURE LOSSES .2 K/C
*

*EQUIV.CIRCULATING DENSITY	1.06	KG/L
* MAX DEPTH	2393.57	METERS
* MUD LAG TIMES S -> B	1.91	MN
* ———— B -> S	32.43	MN
* CUTTINGS DATA SIZE	.20	CM
* ———— DENSITY	.00	KG/L
* LAG TIME	32.43	MN
* MAX SLIP VELOCITY	.00	M/MN
* BIT DATA SIZE	12.25	INCH
* ———— NOZZLES	13 13 13	/32NDS
* NOZZLES EFFICIENCY	95	%
* P. LOSSES	194.1	K/C
* POWERS RATIO	89.13	
* H.P/SQ.INCHES	9.784	
* ———— MUD VELOCITY	188.16	M/S

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

3/ 6/82 — HAMMERHEAD #1

BIT#12 RUN#25 SEQ NBR: 0

STARTING DEPTH 591.00 METERS

BIT DATA SIZE 12.25
H/TOOT HTC J1
NOZZLES 13 13 13 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	54	9.20	4.20	5.00	29.02
2	DRILL COLLAR	1	80.00	2.81	7.75	207.00

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	18.73	143.00	554.00
OPEN HOLE 1	12.25	554.00	591.50

COST DATA BIT COST 7500 $ RIG COST 5833 $/HR
TRIP TIME 3.00 HRS

WEIGHTS HOOK LOAD OFF BOTTOM 72.1 TONS
STRING WEIGHT IN AIR 32.8 TONS

VOLUMES ANNULUS 87.1 M3 IN PIPES 5.8 M3

DEVIATION 4.0 DEG 7.00 M / 100 M

HYDRAULICS NOMINAL ANNULUS PRESSURE LOSSES AT 1600 L/MN : 13 KPA

BIT WEAR TYPE EXPONENT .5
EXPECTED: RUN LENGTH 300 METERS TEETH WEAR 2 /8TH

GEOSERVICES — HAMMERHEAD #1 — DATE : 3/ 6/82

ON-LINE

BIT#12 RUN#25 HTC J1 BIT DIAMETER : 12.25 inch NOZZ 13/13/13 MUD RHEOLOGICAL PARAMETERS : PV = 4 YP = 6 GEL = 3

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	TRIP GAS	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	Nm	KPA	l/mn	m3	sg		degC		ohmm					sg	sg	sg	met	DHr	$/m
D	4: 6	603.1	609.6	557.8	26.9	8.1	76	11.8	17214	2749	46.8	1.09	1.07	23.2	22.2	.29	.30		.84	.00	.00	1.6		20.1	.34	1342
D	4: 8	604.2	603.1	557.8	31.9	8.2	75	12.7	17075	2729	44.2	1.11	1.07	23.3	22.0	.29	.30	.2	.85	.00	.00	1.12		21.1	.37	1287
D	4:10	605.1	604.0	557.8	30.2	7.6	76	12.7	16992	2749	42.8	1.06	1.07	23.3	21.9	.29	.30	.2	.85	.00	.00	1.09		22.0	.40	1241
D	4:11	606.1	605.0	557.8	30.2	8.4	75	12.7	16936	2744	42.2	1.06	1.05	23.3	22.3	.29	.30	.1	.80	.00	.00	1.08		23.1	.42	11
D	4:14	607.1	606.0	591.9	20.6	9.2	75	13.7	16825	2747	42.6	1.06	1.05	23.4	22.7	.29	.30	.2	1.01	.00	.00	1.06		24.0	.47	11
D	4:16	608.1	607.0	593.1	33.4	7.2	77	12.7	16992	2749	42.6	1.06	1.07	23.3	22.8	.29	.30	.2	.85	.00	.00	1.06		25.1	.50	1113
D	4:17	609.1	608.0	593.8	41.3	7.8	76	12.7	16741	2749	42.4	1.05	1.07	23.4	22.9	.29	.30	.2	.80	.00	.00	1.06		26.0	.52	1078
D	4:19	610.2	609.2	594.1	41.9	7.7	75	12.7	16797	2749	43.2	1.06	1.07	23.4	23.1	.29	.30	.2	.82	.00	.00	1.06		17.3	.55	1463
D	4:21	611.1	610.0	602.6	25.2	8.3	76	12.7	17047	2734	43.0	1.07	1.07	23.5	23.2	.29	.30	.2	.96	.00	.00	1.07		20.1	.58	1410
D		612.1	611.0	602.6	28.5	7.4	75	11.8	16490	2711	46.2	1.72	1.06	23.6		.29	.30	.2	.88	.00	.00	1.14		21.1		1359
D	4:33	613.2	612.0	602.6	42.4	9.8	74	14.7	16100	2711	45.2	.93	1.07	23.7	23.1	.29	.30	.2	.97	.00	.00	.93		22.1	.60	1305
D	4:36	614.2	613.0	602.6	28.8	8.9	76	10.8	16462	2732	44.6	1.75	1.07	23.8	23.3	.29	.30	.2	1.10	.00	.00	.95		23.1	.71	1258
D	4:37	615.1	614.0	602.6	66.8	8.5	74	12.7	16518	2732	44.6	1.04	1.07	23.8	23.5	.29	.30	.2	.59	.00	.00	1.04		24.1	.73	1218
D	4:39	616.2	615.0	602.6	30.7	8.4	75	12.7	16435	2732	44.2	.98	1.08	23.9	23.6	.29	.30	.2	.92	.00	.00	.98		25.2	.76	1170
D	4:41	617.1	616.1	602.6	37.9	7.2	76	11.8	16657	2711	44.2	.89	1.08	24.0	23.7	.29	.30	.2	1.01	.00	.00	.98		26.2	.79	1128
D	4:44	618.1	617.0	602.6	17.8	8.7	76	11.8	16518	2711	44.6	1.04	1.08	24.1	23.7	.29	.30	3.7	1.16	.00	.00	1.05		27.1	.83	1099
D	4:47	619.1	618.0	604.1	21.2	8.5	75	12.7	16462	2732	44.6	1.04	1.08	24.2	24.0	.29	.30	3.7	1.01	.00	.00	1.05		28.1	.87	1070
D	4:55	620.3	619.2	605.9	40.8	.5	78	8.82	16980	2732	63.2	1.04	1.08	24.5	23.7	.29	.30	3.7	.81	.00	.00	1.05		29.4	.90	1030
D	4:57	621.2	619.9	606.9	32.9	7.5	73	12.7	16574	2711	75.1	1.04	1.08	24.5	23.7	.29	.30	3.7	.85	.00	.00	1.05		30.1	.93	1010
D	4:59	622.1	621.0	608.1	36.1	7.7	74	11.8	16518	2694	73.5	1.04	1.08	24.6	23.8	.29	.30	5.0	.86	.00	.00	1.05		31.2	.96	982
D	5: 1	623.1	621.9	608.7	31.5	7.2	74	12.7	16462	2709	72.7	1.04	1.08	24.6	23.9	.29	.30	5.0	.91	.00	.00	1.05		32.1	.99	959
D	5: 3	624.2	623.0	609.9	35.2	8.0	75	12.7	16407	2694	72.5	1.04	1.07	24.6	24.0	.29	.30	5.0	.85	.00	.00	1.05		33.1	1.03	935
D	5: 5	625.1	623.9	611.1	30.7	7.9	75	11.8	16462	2694	72.1	1.04	1.07	24.7	24.1	.29	.30	3.7	.90	.00	.00	1.05		34.1	1.06	913
D	5: 7	626.2	624.9	611.1	33.3	7.4	74	11.8	16379	2694	72.3	1.04	1.10	24.8	24.1	.30	.30	5.0	.87	.00	.00	1.05		35.1	1.09	893
D	5: 9	627.2	626.0	611.4	32.4	7.7	75	11.8	16407	2694	72.1	1.04	1.06	24.8	24.3	.30	.30	5.0	.88	.00	.00	1.05		36.2	1.12	872
D	5:10	628.2	626.9	612.3	30.5	8.6	75	12.7	16435	2704	71.9	1.04	1.04	24.9	24.2	.30	.30	3.7	.84	.00	.00	1.05		37.1	1.15	853
D	5:13	629.1	628.0	613.0	26.5	8.4	74	12.7	16017	2694	72.1	1.04	1.08	24.9	24.4	.30	.30	5.0	.93	.00	.00	1.05		38.1	1.18	836
D	5:22	630.1	628.9	615.7	17.9	7.5	76	11.8	15265	2694	75.5	1.04	1.08	25.2	24.1	.30	.31	5.0	1.00	.00	.00	1.05		39.1	1.24	824
D	5:25	631.2	630.0	616.9	28.4	5.3	77	10.8	15292	2706	73.9	1.04	1.07	25.3	24.2	.31	.30	5.0	.87	.00	.00	1.05		40.2	1.29	809
D	5:28	632.2	630.9	618.1	15.9	7.3	76	2520	15571	2711	73.3	1.04	1.08	25.4	24.5	.30	.30	3.7	.96	.00	.00	1.05		41.1	1.34	798
D	5:31	633.2	632.0	619.7	21.3	6.8	76	2310	15655	2689	72.7	1.04	1.03	25.4	24.7	.31	.30	5.0	.96	.00	.00	1.05		42.1	1.38	784
D	5:35	634.1	632.9	620.3	10.4	6.7	77	2310	15543	2694	72.9	1.04	1.05	25.5	24.9	.31	.30	3.7	1.13	.00	.00	1.05		43.1	1.45	776
D	5:38	635.1	634.0	621.5	20.1	7.6	76	2310	15292	2694	72.3	1.04	1.06	25.7	25.0	.31	.30	3.7	.96	.00	.00	1.05		44.1	1.49	763
D	5:40	636.1	634.9	622.7	25.1	7.2	77	2310	15070	2674	71.9	1.04	1.06	25.7	25.0	.31	.30	3.7	.91	.00	.00	1.05		45.1	1.53	752
D	5:42	637.2	635.9	623.9	25.5	7.0	77	2310	14986	2701	72.3	1.04	1.04	25.8	25.0	.31	.30	3.7	.91	.00	.00	1.05		46.1	1.57	740
D	5:46	638.2	636.9	625.8	15.0	7.4	77	2310	15125	2711	72.5	1.04	1.03	26.0	24.8	.31	.31	3.7	1.04	.00	.00	1.05		47.1	1.63	731
D	5:54	639.2	637.9	628.2	22.9	7.6	77	2520	15655	2767	75.9	1.04	1.06	26.2	24.6	.32	.32	3.7	.95	.00	.00	1.05		48.1	1.67	722
D	5:57	640.1	639.0	629.1	29.8	7.2	83	2100	15905	2787	73.9	1.04	1.08	26.2	24.3	.31	.31	3.7	.88	.81	1.03	1.05	1.48	49.2	1.70	710
D	6: 1	641.1	639.9	629.7	18.4	7.2	79	2310	15432	2787	72.1	1.04	1.08	26.2	24.6	.32	.32	3.7	1.14	.81	1.03	1.05	1.48	50.1	1.78	705
D	6: 4	642.1	640.9	631.2	22.9	7.2	81	2520	15460	2785	72.5	1.04	1.07	26.3	24.6	.32	.33	3.7	.94	.81	1.03	1.05	1.48	51.1	1.83	698
D	6: 6	643.2	641.9	631.9	34.7	7.5	81	2310	15627	2767	72.1	1.04	1.07	26.3	24.6	.32	.34	3.7	.84	.81	1.03	1.05	1.48	52.1	1.87	688
D	6: 9	644.2	642.9	632.8	23.0	7.2	79	2310	15655	2705	72.3	1.05	1.07	26.3	24.6	.32	.33	3.7	.92	.81	1.03	1.06	1.48	53.1	1.91	679
D	6:13	645.4	643.9	634.8	18.6	7.1	79	2310	15766	2787	71.3	1.06	1.07	26.4	24.5	.32	.33	3.7	1.00	.81	1.03	1.05	1.48	54.1	1.97	672
D	6:14	646.2	644.9	634.6	30.9	7.9	79	2310	15579	2787	70.9	1.04	1.07	26.4	24.6	.31	.32	3.7	.87	.81	1.03	1.05	1.48	55.1	1.99	664
D	6:17	647.1	645.9	635.8	18.1	7.7	101	2310	16295	2787	70.5	1.05	1.06	26.4	24.6	.31	.34	3.7	1.05	.81	1.03	1.06	1.48	56.1	2.04	657

ON-LINE TDC
GEOSERVICES BIT REPORT

\# 3/ 6/82 HAMMERHEAD #1

*BIT HEADING :BIT#12 RUN#25
*BIT TYPE :M/TOOT
*BIT IDENTITY :HTC J1

*BIT SIZE : 12.25 INCH
*BIT COST : 7500. $ RIG COST/HR: 5033.

*NOZZLES : 13 13 13 /32NDS @ 95 % EFFICIENCY

*DEPTH IN : 591.20 METERS 3/ 6/82
*DEPTH OUT : 647.82 METERS 3/ 6/82
*METRAGE : 56.62 METERS
*TOTAL REVOLUTIONS : 8

*DRILLING TIME: 2: 5 HR AVERAGE ROP: 27.28 M/HR
*TIME IN HOLE : 2:17 HR AVERAGE ROP: 24.71 M/HR
*TRIP TIME : 3: 0 HR

*DRILLING COST STANDARD : 677.6 $/MET
*DRILLING COST ON BOTTOM : 655.4 $/MET
*DRILLING COST MINIMUM : 653.7 $/MET

\# AVERAGE OVER THE RUN AVERAGE HYDRAULICS

*WEIGHT ON BIT : 7.70 TONS NOZZLES SPEED : 182.15 M/S
*ROTATION : 97.00 RPM PRESSURE DROP : 19093 KPA
*FLOW RATE :2740.00 L/MN HYDRAULIC POWER:1169.42 H.P
*STAND PIPE PRESSURE: 16800 KPA

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

3/ 6/82 TIME 6:31

HAMMERHEAD #1

DPTH OF EXECUTION 647.82 METERS

FLOW RATE 2740 L/MN

BINGHAM

MUD DATA	WEIGHT	94	SG
	PV	o	CPS
	YP	21.00	LB/FT2
	GEL	6.00	LB/100 FT2
	N	.3626	
	K	2.1009	LB/100 FT2
HOLES VOLUMES	WITH PIPES	96.20	M3
	WITHOUT PIPES	100.51	M3
	ANNULAR	90.72	M3
	INSIDE PIPES	5.56	M3

	FROM	TO	PIPE ID	PIPE OD	HOLE DIAM	P.LOSSES	H.P	TYPE	CRITICAL FLOW	MUD VELOCITY	CUTTINGS VELOCITY
	METERS		INCH	INCH	INCH	KPA			L/MN	M/MN	M/MN
SURF.EQPT						502	31				
DR.STRING	.00	561.20	4.28	5.00		1109	68				
DR.STRING	561.20	650.00	2.81	7.75		1315	01				
BIT						19093	1169	M/S		102.1	
ANNULUS	647.02	559.02		7.75	12.25	33	2	LA	4413.3	60.1	57.5
ANNULUS	559.02	554.00		5.00	12.25	1	0	LA	6857.0	43.2	41.0
ANNULUS	554.00	143.00		5.00	10.73	40	3	LA	15629.	16.6	15.9
ANNULUS	143.00	.00		5.00	16.75	19	1	LA	12204.	21.2	20.3
TOTAL						22120	1355				

ANNULAR PRESSURE LOSSES 101 KPA

EQUIV.CIRCULATING DENSITY 1.06 SG

MAX DEPTH 1941.11

MUD LAG TIMES	S -> B	2.03	MN
	B -> S	33.11	MN
CUTTINGS DATA	SIZE	.20	CM
	DENSITY	2.40	SG
	LAG TIME	34.64	MN
	MAX SLIP VELOCITY	2.57	M/MN
BIT DATA	SIZE	12.25	INCH
	NOZZLES	13 13 13	/32NDS
	NOZZLES EFFICIENCY	95	%
	BIT P. LOSSES	19093	KPA
	H.H.P RATIO	86.32	%
	BIT H.H.P	9.922	
	BIT VELOCITY	102.15	M/S

GEOSERVICES — HAMMERHEAD #1 — DATE : 3/ 6/82

ON-LINE TDC

BIT#12 RUN#25 HTC J1 BIT DIAMETER : 12.25 inch NOZ 7/13/13 MUD RHEOLOGICAL PARAMETERS : PV = 6 YP = 21 GEL = 6

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED		DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE NORM	SURVEY ECD	SURVEY FRAC	ACCUMULATED METER	ACCUMULATED TIME	ON BIT COST
	Hr:mn	met	met	met		ton	rpm	Nm	KPA	l/mn	m3	sg		degC		ohm		unit		sg	sg	sg	met	DHr	$/m
D	6:36	648.2	647.8	637.6		5.2	92	2100	19334	2749	70.3	1	1.06	26.4	23.[illegible]	.30	.33	3.7	.90	.81	1.03	1.11	1.48	57.2	2.08	648
D	6:39	649.2	647.9	640.4		6.0	100	2310	19241	2714	68.3	1	1.06	26.4	24	.30	.33	3.7	.89	.81	1.03	1.12	1.48	58.1	2.12	643
D	6:42	650.2	648.9	641.3	13.7	7.0	100	2310	19272	2749	67.2	1.04	1.05	26.3	24	.30	.33	2.5	1..	.81	1.03	1.05	1.48	59.1	2.18	637
D	6:46	651.1	649.9	643.1	11.4	7.4	100	2310	19210	2732	66.4	1.04	1.05	26.3	24.[illegible]	.30	.33	3.7	1.16	.81	1.03	1.05	1.48	60.1	2.25	
D	6:50	652.2	650.9	644.3	22.6	6.9	100	2310	19117	2714	66.0	1.04	1.05	26.3	25.0	.30	.33	3.7	.98	.81	1.03	1.05	1.48	61.2	2.32	629
D	6:54	653.1	651.9	645.9	17.2	6.2	101	2100	19210	2749	66.2	1.04	1.05	26.4	25.0	.29	.32	17.5	1.05	.81	1.03	1.05	1.48	62.1	2.38	626
D	6:57	654.1	652.9	646.8	24.3	7.3	99	2310	19117	2711	65.8	1.04	1.06	26.4	25.0	.30	.32	5.0	.96	.81	1.03	1.05	1.48	63.2	2.43	620
D	7: 0	655.1	653.9	647.4	19.3	7.0	100	2100	19148	2694	66.0	1.04	1.06	26.4	25.0	.30	.32	3.7	1.01	.81	1.03	1.05	1.48	64.1	2.47	615
D	7: 3	656.1	654.9	648.0	15.6	7.0	99	2310	19148	2732	66.0	1.04	1.06	26.5	24.8	.30	.32	3.7	1.07	.81	1.03	1.05	1.48	65.1	2.53	610
D	7: 6	657.1	655.9	648.8	28.5	6.3	102	2100	19210	2732	66.6	1.04	1.06	26.5	24.6	.30	.32	2.5	.93	.81	1.03	1.05	1.48	66.1	2.58	605
D	7:22	658.1	656.9	648.9	25.7	5.7	99	2100	18559	2678	67.4	1.04	1.05	26.5	23.6	.30	.31	2.5	.92	.81	1.03	1.05	1.48	67.1	2.65	602
D	7:25	659.1	657.9	650.1	18.8	7.9	97	2310	18403	2678	66.6	1.04	1.05	26.5	24.8	.30	.30	2.5	1.03	.81	1.03	1.05	1.48	68.1	2.71	599
D	7:28	660.1	658.9	650.7	31.4	7.1	98	2310	18124	2676	66.4	1.04	1.05	26.4	25.0	.30	.30	2.5	.89	.81	1.03	1.05	1.48	69.1	2.76	594
D	7:31	661.1	659.9	651.1	21.3	7.0	100	2310	18466	2691	66.2	1.04	1.06	26.4	25.0	.30	.30	2.5	.97	.81	1.03	1.05	1.48	70.1	2.80	589
D	7:34	662.2	660.9	652.8	20.1	5.9	99	2100	18434	2696	66.6	1.04	1.05	26.4	24.9	.30	.31	2.5	.97	.81	1.03	1.05	1.48	71.1	2.85	585
D	7:40	663.1	661.9	653.8	9.1	6.8	97	2310	18000	2696	66.2	1.04	1.05	26.4	25.0	.30	.31	2.5	1.19	.81	1.03	1.05	1.48	72.2	2.95	585
D	7:43	664.2	662.9	654.7	24.2	6.7	99	2310	18497	2676	66.2	1.04	1.04	26.5	25.0	.30	.31	2.5	.95	.81	1.03	1.05	1.48	73.1	3.00	581
D	7:46	665.1	663.8	655.9	21.1	6.5	98	2310	18372	2696	66.2	1.04	1.05	26.5	25.0	.30	.32	2.5	.98	.81	1.03	1.05	1.48	74.1	3.04	577
D	7:50	666.1	664.9	657.2	17.0	5.9	100	2100	18559	2676	67.0	1.04	1.05	26.5	24.9	.29	.31	1.2	1.04	.81	1.03	1.05	1.48	75.2	3.12	574
T	8:10	666.9	665.6	657.2	----	---	0	630.	-1140	0	76.7	1.04	1.06	26.5	24.5	.29	.29	3.7	----------	----------	----------	----------	----------	----------	----------	----------
D	8:27	667.1	665.9	657.8	1.6	9.2	105	2730	17379	2590	70.1	1.04	1.05	26.4	19.8	.29	.34	2.5	1.20	.81	1.03	1.05	1.48	76.1	3.30	581
D	8:30	668.1	666.8	658.1	35.4	9.1	105	2730	17472	2618	67.6	1.04	1.06	26.3	20.3	.29	.34	1.2	.96	.81	1.03	1.05	1.49	77.1	3.34	577
D	8:32	669.2	667.9	658.7	27.6	8.2	107	2520	17534	2590	66.6	1.04	1.05	26.3	23.5	.29	.31	1.2	1.00	.81	1.03	1.05	1.49	78.1	3.37	571
D	8:34	670.1	668.9	659.8	32.3	7.0	108	2310	17379	2560	66.2	1.04	1.06	26.2	24.5	.30	.30	1.2	.93	.81	1.03	1.05	1.49	79.1	3.41	567
D	8:35	671.1	669.8	659.9	36.9	8.6	108	2520	17379	2598	66.2	1.04	1.05	26.1	24.8	.30	.31	2.5	.89	.81	1.03	1.05	1.49	80.1	3.44	562
D	8:40	672.1	670.9	661.1	11.8	9.4	107	2520	17379	2580	65.6	1.04	1.05	25.9	25.0	.30	.32	1.2	1.22	.81	1.03	1.05	1.49	81.1	3.50	560
D	8:43	673.1	671.9	662.3	16.5	9.6	108	2520	17472	2590	65.8	1.04	1.05	25.8	25.0	.29	.32	1.2	1.16	.81	1.03	1.05	1.49	82.2	3.57	557
D	8:46	674.2	672.9	662.6	26.9	7.8	109	2310	17620	2560	65.2	1.04	1.05	25.8	25.0	.29	.32	1.2	1.00	.81	1.03	1.05	1.49	83.2	3.60	553
D	8:48	675.1	673.8	662.9	25.4	8.2	110	2310	17472	2598	65.6	1.04	1.05	25.8	25.1	.29	.31	2.5	1.02	.81	1.03	1.05	1.49	84.1	3.65	550
D	8:58	676.2	674.8	665.1	21.4	6.5	102	2100	16417	2486	66.6	1.04	1.06	26.0	24.4	.29	.32	2.5	1.01	.81	1.03	1.04	1.49	85.1	3.71	547
D	9: 0	677.1	675.8	665.4	30.9	8.8	97	2520	17284	2580	65.6	1.04	1.06	26.0	24.9	.29	.32	2.5	.96	.81	1.03	1.05	1.49	86.1	3.74	544
D	9: 4	678.2	676.8	666.3	12.4	9.7	98	2520	17286	2580	64.6	1.04	1.06	26.1	25.2	.30	.32	3.7	1.23	.81	1.03	1.05	1.49	87.1	3.81	541
D	9: 7	679.1	677.8	666.9	20.5	10.4	99	2520	17286	2600	64.4	1.04	1.06	26.2	25.1	.30	.32	2.5	1.09	.81	1.03	1.05	1.49	88.1	3.86	539
D	9:10	680.1	678.8	667.2	29.2	9.2	98	2520	17193	2560	65.0	1.04	1.06	26.2	25.0	.30	.32	3.7	.97	.81	1.03	1.05	1.49	89.1	3.90	536
D	9:13	681.1	679.8	667.8	22.9	10.7	98	2520	17067	2502	64.6	1.04	1.06	26.2	25.1	.30	.32	3.7	1.03	.81	1.03	1.05	1.49	90.1	3.95	532
D	9:17	682.1	680.8	670.9	11.9	9.7	99	2310	17193	2580	65.0	1.04	1.07	26.3	25.0	.30	.32	5.0	1.24	.81	1.03	1.05	1.49	91.1	4.02	531
D	9:21	683.2	681.8	671.8	14.9	8.8	98	2310	17224	2600	64.4	1.04	1.06	26.5	25.0	.30	.31	3.7	1.15	.81	1.03	1.05	1.49	92.2	4.08	529
D	9:25	684.1	682.9	672.7	17.7	10.0	99	2310	17224	2600	64.2	1.04	1.06	26.5	25.0	.30	.32	3.7	1.11	.81	1.03	1.05	1.49	93.2	4.14	527
D	9:35	685.2	683.8	675.1	32.3	9.2	104	2520	18186	2673	65.6	1.04	1.06	26.6	24.0	.30	.32	5.0	.96	.81	1.03	1.05	1.49	94.1	4.19	525
D	9:36	686.1	684.8	675.1	27.2	9.3	103	2520	18240	2655	64.6	1.04	1.06	26.6	24.3	.30	.32	5.0	1.01	.81	1.03	1.05	1.49	95.2	4.21	521
D	9:38	687.2	685.9	675.4	35.0	9.4	105	2520	17317	2655	64.2	1.04	1.06	26.6	25.0	.30	.31	3.7	.95	.81	1.03	1.05	1.49	96.2	4.25	517
D	9:41	688.2	686.8	676.4	21.4	8.5	103	2520	17131	2620	64.4	1.04	1.06	26.6	25.1	.30	.31	3.7	1.07	.81	1.03	1.05	1.49	97.1	4.29	515
D	9:45	689.2	687.8	677.6	16.8	9.7	105	2520	17162	2580	63.8	1.04	1.07	26.6	25.1	.30	.31	3.7	1.15	.81	1.03	1.05	1.49	98.1	4.35	513
D	9:48	690.1	688.8	678.5	15.6	9.6	102	2730	17255	2580	63.4	1.04	1.07	26.6	25.1	.30	.31	3.7	1.15	.81	1.03	1.05	1.49	99.1	4.40	511
D	9:52	691.2	689.8	680.3	13.4	9.6	104	2310	17100	2600	63.4	1.04	1.07	26.7	25.2	.30	.31	5.0	1.21	.81	1.03	1.05	1.49	100.1	4.47	510
D	9:56	692.1	690.8	681.2	12.7	9.4	104	2520	16603	2577	63.6	1.04	1.05	26.7	25.1	.30	.32	3.7	1.21	.81	1.03	1.05	1.49	101.1	4.54	509
D	10: 0	693.2	691.8	682.4	15.4	9.6	102	2520	17317	2577	63.4	1.04	1.07	24.0	25.0	.30	.32	3.7	1.14	.81	1.03	1.05	1.49	102.1	4.61	507
D	10:10	694.1	692.8	684.0	14.2	9.8	99	2310	17162	2600	66.0	1.04	1.06	24.4	24.5	.30	.33	3.7	1.11	.81	1.03	1.05	1.49	103.1	4.67	506
D	10:14	695.1	693.9	684.3	21.0	8.0	97	2310	17255	2577	63.6	1.04	1.02	24.4	24.8	.30	.33	3.7	1.03	.81	1.03	1.05	1.49	104.2	4.73	504

GEOSERVICES — HAMMERHEAD #1 — DATE : 3/ 6/02

ON-LINE TDC

BIT#12 RUN#5 HTC J1 BIT DIAMETER : 12.25 inch NOZZ 13/13/13 MUD RHEOLOGICAL PARAMETERS : PV = 6 YP = 21 GEL = 6

		DEPTHS				DRILLING PARAMETERS						MUD PARAMETERS						GAS		OVERPRESSURE SURVEY					ACCUMULATED ON BIT		
	TIME	MEASURED	VERTCL	LAGGED	ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT		DCS	NORM	PP	ECD	FRAC	METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	Dhr	$/m
D	10:16	696.3	694.8	685.2	31.2	7.7	99	2520	16945	2500	63.0	1.04	1.00	24.4	25.3	.30	.32	2.5	.93	.81	1.03	1.05	1.49	105.1	4.76	502
D	10:18	697.1	695.8	685.8	28.9	7.9	98	2310	17317	2615	62.8	1.04	1.05	24.4	25.6	.30	.32	3.7	.95	.81	1.03	1.05	1.49	106.1	4.77	499
D	10:22	698.1	696.8	687.6	15.9	9.1	102	2310	17317	2595	63.0	1.04	1.05	24.3	25.6	.30	.33	3.7	1.11	.81	1.03	1.05	1.49	107.1	4.86	497
D	10:27	699.2	697.8	689.2	11.7	8.0	102	2310	17628	2615	62.6	1.04	1.05	24.4	25.5	.30	.32	3.7	1.19	.81	1.03	1.05	1.49	108.1	4.95	498
D	10:31	700.2	698.8	690.1	20.1	8.9	99	2310	17286	2598	63.0	1.04	1.05	24.4	25.7	.30	.33	3.7	1.05	.81	1.03	1.05	1.49	109.2	5.01	496
D	10:34	701.1	699.8	690.7	16.9	9.4	99	2310	17379	2598	62.8	1.04	1.05	24.4	25.7	.30	.32	5.0	1.10	.81	1.03	1.05	1.49	110.2	5.06	495
D	10:39	702.1	700.8	691.9	13.7	8.5	102	2310	17348	2610	62.8	1.04	1.05	24.5	25.6	.30	.32	3.7	1.16	.81	1.03	1.05	1.49	111.1	5.14	494
D	10:54	704.8	702.8	693.7	24.9	9.2	101	2730	17566	2623	65.2	1.04	1.05	24.5	24.1	.30	.33	2.5	.97	.81	1.03	1.05	1.50	113.1	5.24	491
D	10:54	704.1	702.8	693.7	24.9	8.6	101	2520	17566	2630	65.0	1.04	1.04	24.5	24.1	.30	.34	2.5	.97	.81	1.03	1.05	1.50	113.1	5.24	491
D	10:57	705.3	703.8	694.6	18.6	8.8	103	2520	17752	2615	63.0	1.04	1.04	24.6	25.1	.30	.32	3.7	1.07	.81	1.03	1.05	1.50	114.1	5.29	489
D	11: 3	706.1	704.8	697.4	12.2	7.9	100	2520	17752	2635	62.4	1.04	1.04	24.5	25.9	.30	.32	3.7	1.10	.81	1.03	1.05	1.50	115.2	5.39	490
D	11: 7	707.1	705.3	698.3	18.1	8.3	107	2310	17628	2635	62.2	1.04	1.03	24.5	25.9	.30	.32	3.7	1.07	.81	1.03	1.05	1.50	116.2	5.46	489
D	11:11	708.1	706.8	698.9	15.8	6.8	103	2100	16976	2635	62.8	1.04	1.03	24.5	26.0	.30	.32	3.7	1.10	.81	1.03	1.05	1.50	117.2	5.52	488
D	11:16	709.1	707.8	700.1	9.4	6.7	105	2100	17534	2625	62.2	1.04	1.02	24.6	25.9	.30	.32	3.7	1.20	.81	1.03	1.05	1.50	118.1	5.60	488
D	11:19	710.1	708.9	701.0	17.4	8.3	102	2310	17418	2656	62.4	1.04	1.03	24.6	25.8	.30	.33	3.7	1.10	.81	1.03	1.05	1.50	119.2	5.66	487
D	11:23	711.1	709.8	702.0	13.7	8.5	102	2520	17348	2674	62.8	1.04	1.03	24.7	26.0	.30	.32	3.7	1.17	.81	1.03	1.05	1.50	120.2	5.72	485
D	11:34	713.4	712.2	702.6	44.5	9.6	88	2520	17503	2637	64.8	1.04	1.04	24.8	25.4	.30	.34	2.5	.86	.81	1.03	1.05	1.50	122.5	5.78	479
D	11:38	714.1	712.9	704.4	10.9	9.6	101	2730	18031	2655	62.4	1.04	1.05	24.8	25.2	.30	.33	3.7	1.21	.81	1.03	1.05	1.50	123.2	5.84	479
D	11:41	715.2	713.8	705.3	20.6	9.5	105	2940	17938	2637	61.6	1.04	1.05	24.8	26.0	.30	.32	3.7	1.07	.81	1.03	1.05	1.50	124.1	5.89	478
D	11:44	716.1	714.8	705.3	22.8	7.9	105	2520	17597	2637	61.8	1.04	1.04	24.8	26.1	.30	.32	3.7	1.03	.81	1.03	1.05	1.50	125.2	5.94	476
D	11:47	717.1	715.8	706.2	24.9	9.0	105	2310	17930	2675	61.6	1.04	1.04	24.8	26.2	.30	.32	2.5	1.02	.81	1.03	1.05	1.50	126.2	5.99	475
D	11:50	718.1	716.8	707.1	27.2	7.8	100	2310	17534	2620	61.6	1.04	1.04	24.8	26.1	.30	.32	3.7	.98	.81	1.03	1.05	1.50	127.1	6.04	473
D	11:54	719.1	717.8	708.1	20.5	9.7	107	2520	17224	2652	61.4	1.04	1.04	24.8	26.1	.30	.32	3.7	1.05	.81	1.03	1.05	1.50	128.1	6.10	473
D	11:57	720.1	718.8	708.7	22.0	9.1	105	2520	18000	2652	61.2	1.04	1.04	24.9	26.2	.30	.33	3.7	1.06	.81	1.03	1.05	1.50	129.1	6.15	471
D	12: 0	721.1	719.8	709.6	18.7	7.9	105	2310	18031	2637	61.0	1.04	1.04	24.9	26.2	.30	.32	3.7	1.07	.81	1.03	1.05	1.50	130.1	6.21	470
D	12: 3	722.1	720.8	710.2	20.3	9.1	103	2520	17876	2652	61.0	1.04	1.04	25.0	26.2	.30	.33	3.7	1.07	.81	1.03	1.05	1.50	131.1	6.26	469
D	12:15	723.1	721.8	711.7	13.1	7.5	111	2310	17193	2617	63.0	1.04	1.12	25.1	25.2	.30	.34	3.7	1.14	.81	1.03	1.04	1.50	132.1	6.33	468
D	12:18	724.1	722.9	713.2	25.2	9.1	105	2520	17441	2615	61.6	1.04	1.13	25.1	25.4	.30	.33	3.7	.98	.81	1.03	1.04	1.50	133.2	6.38	467
D	12:22	725.2	723.8	714.1	14.7	9.2	107	2520	16852	2617	61.2	1.04	1.12	25.1	26.3	.31	.32	3.7	1.12	.81	1.03	1.04	1.50	134.1	6.44	466
D	12:25	726.1	724.8	715.1	16.8	8.3	103	2520	17100	2597	61.4	1.04	1.13	25.0	26.3	.30	.32	5.0	1.10	.81	1.03	1.04	1.50	135.1	6.49	465
D	12:28	727.2	725.8	716.3	19.6	8.6	103	2310	17162	2658	61.0	1.04	1.13	25.0	26.3	.30	.33	3.7	1.06	.81	1.03	1.05	1.50	136.2	6.54	464
D	12:32	728.1	726.9	717.5	19.0	8.0	106	2310	17193	2615	61.2	1.04	1.13	25.0	26.3	.31	.33	5.0	1.06	.81	1.03	1.04	1.50	137.2	6.59	462
D	12:35	729.1	727.8	718.4	17.0	9.5	103	2520	17418	2582	61.2	1.04	1.13	25.1	26.3	.30	.32	5.0	1.09	.81	1.03	1.04	1.50	138.2	6.65	461
D	12:39	730.1	728.8	719.3	16.9	6.9	103	2100	17193	2620	61.2	1.04	1.13	25.1	26.3	.31	.33	5.0	1.07	.81	1.03	1.04	1.50	139.1	6.71	461
D	12:43	731.1	729.8	720.5	16.2	7.1	105	2100	16976	2599	61.4	1.04	1.13	25.2	26.5	.30	.33	5.0	1.07	.81	1.03	1.04	1.50	140.1	6.78	460
D	12:58	732.1	730.8	722.7	6.4	7.2	99	2520	18031	2668	61.0	1.04	1.12	25.2	25.4	.30	.33	5.0	1.23	.81	1.03	1.05	1.50	141.2	6.90	462
D	13: 2	733.1	731.8	723.9	15.8	6.9	98	2310	18124	2656	60.8	1.04	1.13	25.2	26.5	.31	.32	5.0	1.03	.82	1.03	1.05	1.50	142.1	6.97	462
D	13: 6	734.1	732.8	725.4	16.3	7.2	98	2310	18031	2673	60.6	1.04	1.13	25.2	26.5	.31	.33	5.0	1.03	.82	1.03	1.05	1.50	143.1	7.04	461
D	13:10	735.2	733.8	726.0	14.1	6.8	100	2310	18093	2658	60.6	1.04	1.13	25.2	26.5	.31	.33	5.0	1.07	.82	1.03	1.05	1.50	144.1	7.10	461
D	13:13	736.2	734.8	727.3	20.3	6.7	99	2310	17876	2673	60.6	1.04	1.12	25.2	26.7	.30	.33	6.2	.98	.82	1.03	1.05	1.50	145.1	7.16	460
D	13:17	737.1	735.8	728.5	14.1	7.7	100	2310	17845	2658	60.4	1.04	1.13	25.3	26.6	.30	.33	5.0	1.08	.82	1.03	1.05	1.51	146.1	7.22	459
D	13:22	738.1	736.8	730.8	13.5	8.8	97	2310	17938	2694	60.4	1.04	1.12	25.3	26.5	.31	.34	5.0	1.10	.82	1.03	1.05	1.51	147.2	7.30	459
D	13:26	739.1	737.8	730.6	13.8	7.7	100	2310	18062	2676	60.4	1.04	1.12	25.4	26.6	.30	.32	5.0	1.10	.82	1.03	1.05	1.51	148.1	7.36	459
D	13:29	740.1	738.8	731.5	17.9	7.5	98	2310	18031	2658	60.2	1.04	1.13	25.4	26.5	.31	.34	5.0	1.03	.82	1.03	1.04	1.51	149.2	7.42	458
D	13:41	741.1	739.8	732.1	10.9	6.5	101	2100	18031	2655	60.8	1.04	1.13	25.5	25.8	.30	.34	3.7	1.14	.82	1.03	1.04	1.51	150.1	7.50	458
D	13:45	742.2	740.8	732.7	17.2	7.2	100	2310	18124	2658	60.0	1.04	1.12	25.5	26.7	.30	.34	5.0	1.03	.82	1.03	1.04	1.51	151.1	7.57	457
D	13:51	743.1	741.7	734.6	17.2	8.5	99	2310	17721	2658	60.4	1.04	1.12	25.4	26.9	.31	.33	3.7	1.07	.82	1.03	1.04	1.51	152.1	7.62	456
D	13:54	744.1	742.8	735.2	17.4	8.9	96	2520	17814	2635	60.4	1.04	1.12	25.4	26.9	.31	.33	3.7	1.03	.82	1.03	1.04	1.51	153.1	7.68	456
D	13:58	745.1	743.8	736.7	15.5	9.7	97	2730	17534	2658	60.6	1.04	1.12	25.5	26.9	.31	.33	5.0	1.11	.82	1.03	1.04	1.51	154.1	7.75	455

GEOSERVICES — HAMMERHEAD #1 — DATE : 3/ 6/82

ON-LINE TDC

BIT#12 RUN#25 HTC J1 BIT DIAMETER : 12.25 inch NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 6 YP = 21 GEL = 6

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg	sg	degC	degC	ohmm	ohmm	unit	sg	sg	sg	sg	sg	met	DHr	$/m
D	14: 2	746.2	744.8	737.0	18.2	8.2	99	2310	17597	2660	59.8	1.04	1.12	25.5	26.8	.31	.33	3.7	1.06	.82	1.03	1.05	1.51	155.1	7.81	455
D	14: 6	747.1	745.8	737.9	15.6	8.9	100	2520	17876	2655	60.0	1.04	1.12	25.6	26.9	.31	.33	3.7	1.10	.82	1.03	1.04	1.51	156.2	7.88	454
D	14: 9	748.1	746.8	739.1	15.8	8.5	96	2310	17628	2655	60.0	1.04	1.12	25.6	27.0	.31	.33	3.7	1.09	.82	1.03	1.04	1.51	157.2	7.93	453
D	14:21	749.2	747.8	740.4	13.8	9.5	101	2730	16697	2620	62.0	1.04	1.12	25.7	26.0	.31	.34	3.7	1.09	.82	1.03	1.04	1.51	158.1	7.99	453
D	14:24	750.1	748.8	740.7	21.0	8.3	102	2520	16945	2579	60.4	1.04	1.13	25.7	26.1	.30	.34	3.7	1.02	.82	1.03	1.04	1.51	159.1	8.05	452
D	14:27	751.1	749.7	741.3	24.8	8.6	104	2520	16572	2595	59.8	1.04	1.13	25.7	26.8	.31	.33	3.7	1.00	.82	1.03	1.04	1.51	160.1	8.10	451
D	14:31	752.1	750.8	742.2	19.8	8.3	103	2310	17100	2592	59.6	1.04	1.13	25.6	27.1	.31	.33	3.7	1.03	.82	1.03	1.04	1.51	161.1	8.16	450
D	14:34	753.1	751.7	742.5	21.5	9.1	102	2520	16697	2637	59.4	1.04	1.13	25.7	27.0	.31	.34	3.7	1.02	.82	1.03	1.04	1.51	162.1	8.21	450
D	14:38	754.1	752.8	743.4	18.8	8.3	104	2520	16541	2594	59.2	1.04	1.13	25.7	27.1	.31	.33	3.7	1.05	.82	1.03	1.04	1.51	163.2	8.28	449
D	14:42	755.1	753.8	744.3	13.6	7.4	104	2310	16821	2600	59.0	1.04	1.13	25.7	27.0	.30	.32	5.0	1.13	.82	1.03	1.04	1.51	164.1	8.34	449
D	14:46	756.2	754.7	745.8	10.8	8.4	105	2310	16821	2617	58.8	1.04	1.13	25.8	26.8	.31	.34	5.0	1.17	.82	1.03	1.04	1.51	165.1	8.42	449
D	14:52	757.1	755.3	747.4	12.7	8.4	102	2520	16666	2579	58.6	1.04	1.10	25.8	27.0	.31	.33	5.0	1.14	.82	1.03	1.04	1.51	165.6	8.49	449
D	15:11	758.1	756.8	750.7	19.3	7.7	106	2730	16790	2579	61.4	1.04	1.13	25.9	27.1	.30	.34	2.5	.99	.82	1.03	1.04	1.51	167.1	8.56	448
D	15:14	759.2	757.7	751.3	19.6	7.8	107	2520	16759	2615	60.2	1.04	1.12	25.9	26.7	.30	.34	3.7	1.05	.82	1.03	1.04	1.51	168.1	8.61	447
D	15:18	760.2	758.8	752.6	15.2	6.8	106	2310	17087	2597	59.8	1.04	1.11	25.9	27.2	.30	.33	3.7	1.08	.82	1.03	1.04	1.51	169.1	8.67	447
D	15:22	761.1	759.8	753.8	16.5	8.6	106	2520	16914	2600	59.8	1.04	1.12	26.0	27.2	.30	.33	3.7	1.05	.82	1.03	1.04	1.51	170.2	8.73	446
D	15:25	762.1	760.8	754.4	14.4	6.6	104	2520	16479	2579	59.8	1.04	1.12	26.0	27.1	.30	.34	3.7	1.08	.82	1.03	1.04	1.51	171.1	8.79	446
D	15:29	763.2	761.7	755.3	17.7	6.8	105	2520	16479	2620	59.4	1.04	1.12	26.0	27.2	.30	.34	3.7	1.02	.82	1.03	1.04	1.51	172.1	8.85	445
D	15:32	764.1	762.8	755.9	18.2	7.8	107	2520	16803	2600	59.4	1.04	1.12	26.1	27.2	.31	.33	3.7	1.02	.82	1.03	1.04	1.51	173.2	8.89	444
D	15:36	765.2	763.8	756.5	13.6	8.2	106	2520	17087	2617	59.6	1.04	1.12	26.1	27.1	.31	.33	3.7	1.06	.82	1.03	1.04	1.51	174.1	8.97	444
D	15:41	766.1	764.8	757.4	10.8	7.7	105	2520	16976	2620	59.2	1.04	1.13	26.1	27.0	.31	.33	2.5	1.14	.82	1.03	1.04	1.51	175.2	9.04	444
T	16: 1	766.4	764.8	758.3	----	----	0	630.	-1179	0	65.2	1.04	1.11	26.2	28.0	.30	.29	2.5	----------	----------	----------	----------	----------	----------	----------	----------
T	16:21	766.4	764.8	758.3	----	----	0	630.	-1179	0	66.3	1.04	1.15	26.2	27.8	.31	.30	2.5	----------	----------	----------	----------	----------	----------	----------	----------
D	17:47	768.0	764.8	760.2	10.8	.0	3	1680	8317	1149	58.8	1.04	1.14	25.5	20.8	.30	.36	1.2	1.14	.82	1.03	1.04	1.51	175.2	9.07	444
D	17:50	768.8	766.8	766.3	47.4	.0	97	2310	17007	2563	53.4	1.04	1.14	25.4	18.4	.31	.37	1.2	.78	.82	1.03	1.04	1.51	177.2	9.08	440
D	17:51	769.2	767.8	766.3	15.2	7.2	96	2520	15540	2544	52.8	1.04	1.14	25.2	19.3	.30	.34	1.2	.98	.82	1.03	1.04	1.51	178.2	9.09	438
D	17:54	770.2	768.7	766.3	16.2	7.8	96	2730	15703	2506	56.6	1.04	1.13	25.8	26.5	.30	.29	.0	1.05	.82	1.03	1.04	1.51	179.1	9.15	437
D	17:58	771.2	769.8	755.3	16.4	8.8	97	2730	15703	2488	57.4	1.04	1.13	24.6	26.5	.31	.31	.0	1.04	.82	1.03	1.04	1.51	180.2	9.21	437
D	18: 1	772.1	770.8	755.3	15.4	8.4	97	2730	16045	2499	57.2	1.04	1.13	24.4	26.7	.31	.32	2.5	1.07	.82	1.03	1.04	1.51	181.2	9.26	436
D	18: 4	773.2	771.8	755.3	22.9	8.4	96	2520	15579	2491	57.2	1.04	1.13	24.3	26.5	.31	.32	2.5	.99	.82	1.03	1.04	1.52	182.2	9.31	435
D	18: 7	774.1	772.8	755.3	19.1	7.8	97	2520	16045	2506	57.8	1.04	1.13	24.3	26.5	.31	.33	2.5	1.02	.82	1.03	1.04	1.52	183.2	9.36	434
D	18:10	775.1	773.7	755.3	19.2	7.7	96	2730	15517	2476	57.8	1.04	1.13	24.4	26.5	.30	.33	2.5	1.01	.82	1.03	1.04	1.52	184.1	9.40	434
D	18:14	776.1	774.8	755.3	16.3	8.6	98	2520	15610	2504	57.4	1.04	1.13	24.5	26.6	.30	.33	2.5	1.07	.82	1.03	1.04	1.52	185.2	9.46	433
D	18:19	777.4	775.8	755.6	17.6	.0	0	630.	16231	2504	57.2	1.04	1.13	24.6	26.5	.30	.34	2.5	1.04	.82	1.03	1.04	1.52	186.1	9.53	432
D	18:25	779.0	775.8	772.0	17.6	.0	0	630.	-1210	0	62.0	1.04	1.17	24.8	26.5	.30	.32	5.0	1.04	.82	1.03	1.04	1.52	186.1	9.53	432
D	18:29	779.5	777.8	755.6	25.8	-.6	82	1890	15734	2451	60.8	1.04	1.13	24.8	26.8	.30	.37	5.0	.00	.82	1.03	1.04	1.52	188.2	9.53	428
D	18:32	780.2	778.8	755.6	17.8	7.5	93	2730	15859	2489	58.6	1.04	1.14	24.8	25.9	.30	.39	7.5	1.02	.82	1.03	1.04	1.52	189.2	9.58	427
D	18:36	781.1	779.7	756.5	14.3	6.8	96	2520	15238	2489	57.8	1.04	1.13	24.9	26.3	.31	.35	5.0	1.06	.82	1.03	1.04	1.52	190.1	9.65	427
D	18:39	782.2	780.7	768.1	19.7	7.8	93	2730	15548	2524	57.8	1.04	1.13	25.8	26.5	.31	.34	3.7	.99	.82	1.03	1.04	1.52	191.1	9.70	427
D	18:43	783.1	781.2	769.6	15.9	6.8	96	2310	15362	2489	57.8	1.04	1.14	25.1	26.5	.31	.33	3.7	1.06	.82	1.03	1.04	1.52	191.6	9.76	426
D	18:46	784.1	782.8	770.5	20.4	7.4	95	2520	15207	2507	57.8	1.04	1.13	25.2	26.5	.31	.33	3.7	.98	.82	1.03	1.04	1.52	193.2	9.81	425
D	18:48	785.1	783.8	771.1	26.6	7.5	95	2520	15308	2489	56.4	1.04	1.14	25.3	26.5	.31	.33	3.7	.93	.82	1.03	1.04	1.52	194.2	9.85	425
D	18:52	786.1	784.8	772.7	14.9	8.6	94	2520	14276	2507	56.4	1.04	1.13	25.3	26.5	.32	.33	3.7	1.05	.82	1.03	1.04	1.52	195.2	9.91	424
D	19: 3	787.1	785.7	775.7	4.1	8.4	97	2730	15145	2507	55.8	1.04	1.13	25.5	26.4	.31	.34	2.5	1.40	.82	1.03	1.04	1.52	196.1	10.09	427
D	19: 9	788.1	786.7	777.2	12.8	7.7	96	2520	14959	2489	55.2	1.04	1.13	25.6	26.4	.31	.33	2.5	1.10	.82	1.03	1.04	1.52	197.1	10.16	428
D	19:10	789.1	787.7	788.0	26.2	7.8	95	2940	15114	2506	56.2	1.04	1.13	25.6	26.0	.31	.34	2.5	.85	.82	1.03	1.04	1.52	198.1	10.22	427
D	19:20	790.1	788.7	788.6	25.1	7.6	101	2730	15424	2526	55.0	1.04	1.13	25.6	26.1	.31	.33	2.5	.97	.82	1.03	1.04	1.52	199.1	10.25	426
D	19:23	791.2	789.7	781.5	24.9	7.7	100	2730	15486	2506	54.8	1.04	1.13	25.7	26.7	.31	.33	2.5	.94	.82	1.03	1.04	1.52	200.1	10.30	425
D	19:26	792.2	790.8	782.1	22.6	6.9	101	2520	16045	2526	53.6	1.04	1.13	25.5	26.6	.31	.33	2.5	.96	.82	1.03	1.04	1.52	201.2	10.34	424

GEOSERVICES — HAMMERHEAD #1 — DATE : 3/ 6/02

ON-LINE TDC

BIT#12 RUN#25 HTC J1 — BIT DIAMETER : 12.25 inch — NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 6 YP = 21 GEL = 6

	TIME	MEASURED DEPTHS	VERTCL	LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	19:29	793.1	791.8	783.0	19.4	7.8	99	2520	15424	2544	57.8	1.04	1.13	25.2	26.8	.37	.34	2.5	1.01	.82	1.03	1.04	1.52	202.2	10.39	423
D	19:32	794.1	792.8	783.9	17.8	8.4	101	2520	14859	2521	65.8	1.04	1.13	24.9	26.8	.41	.34	2.5	1.04	.82	1.03	1.04	1.52	203.2	10.44	423
D	19:35	795.1	793.8	784.9	22.8	8.2	99	2520	15003	2617	73.9	1.04	1.13	24.7	26.5	.43	.34	2.5	.99	.82	1.03	1.04	1.52	204.2	10.49	422
D	19:38	796.2	794.7	785.8	23.8	8.4	99	2520	14883	2597	82.3	1.04	1.13	24.5	26.5	.44	.34	2.5	.98	.82	1.03	1.04	1.52	205.2	10.54	421
D	19:41	797.1	795.7	786.4	16.7	7.9	101	2520	14718	2612	85.3	1.04	1.13	24.8	26.4	.42	.34	2.5	1.05	.82	1.03	1.04	1.52	206.2	10.59	421
D	19:52	798.1	796.7	786.7	10.6	8.4	96	2730	11669	2592	88.5	1.04	1.13	25.2	25.8	.39	.34	2.5	1.14	.82	1.03	1.04	1.52	207.1	10.66	421
D	19:55	799.1	797.7	787.3	20.8	8.7	97	2730	11234	2579	85.9	1.04	1.13	25.2	26.2	.39	.34	2.5	.99	.82	1.03	1.04	1.52	208.1	10.71	420
D	19:59	800.2	798.7	787.9	17.8	9.1	97	2940	14586	2600	85.1	1.04	1.13	25.3	26.4	.39	.34	2.5	1.06	.82	1.03	1.04	1.52	209.2	10.77	420
D	20: 3	801.1	799.3	788.2	14.1	9.0	97	2730	14555	2579	83.7	1.04	1.13	25.3	26.5	.30	.34	2.5	1.10	.82	1.03	1.04	1.52	209.7	10.84	420
D	20: 8	802.2	800.7	790.7	11.1	6.6	101	2310	13066	2579	84.7	1.04	1.13	25.3	26.5	.37	.33	2.5	1.13	.82	1.03	1.04	1.52	211.1	10.92	420
D	20:12	803.1	801.7	792.2	17.8	8.4	98	2520	14214	2579	83.7	1.04	1.13	25.4	26.6	.36	.33	2.5	1.06	.82	1.03	1.04	1.52	212.1	10.98	420
D	20:15	804.1	802.8	793.1	16.5	7.3	98	2520	14772	2582	83.1	1.04	1.13	25.5	26.6	.36	.33	2.5	1.03	.82	1.03	1.04	1.52	213.2	11.04	419
D	20:19	805.1	803.7	794.3	15.5	8.8	97	2730	14834	2549	82.9	1.04	1.12	25.5	27.2	.35	.40	2.5	1.05	.82	1.03	1.04	1.52	214.1	11.11	419
D	20:23	806.1	804.7	795.8	15.5	7.4	97	2730	14679	2502	82.9	1.04	1.11	25.6	27.5	.35	.45	2.5	1.01	.82	1.03	1.04	1.52	215.2	11.17	419
D	20:36	807.1	805.7	797.4	16.6	7.3	101	2730	14097	2676	83.7	1.04	1.10	25.6	27.5	.34	.49	1.2	1.00	.82	1.03	1.04	1.52	216.2	11.22	418
D	20:39	808.1	806.8	797.7	22.4	7.2	101	2520	16366	2617	80.9	1.04	1.10	25.7	27.3	.34	.49	1.2	.97	.82	1.03	1.04	1.52	217.2	11.26	417
D	20:42	809.1	807.7	798.6	27.4	6.6	101	2520	16603	2625	80.9	1.04	1.10	25.7	27.6	.34	.48	2.5	.91	.82	1.03	1.04	1.53	218.1	11.31	417
D	20:44	810.1	808.8	799.5	25.4	6.3	101	2520	15641	2630	80.3	1.04	1.10	25.7	27.5	.34	.47	2.5	.91	.82	1.03	1.04	1.53	219.2	11.35	416
D	20:47	811.2	809.7	800.1	25.8	7.8	101	2730	16107	2655	79.7	1.04	1.10	25.7	27.5	.35	.46	1.2	.95	.82	1.03	1.04	1.53	220.2	11.39	415
D	20:50	812.2	810.7	800.7	17.7	7.8	101	2520	16572	2637	80.7	1.04	1.10	25.8	27.3	.35	.46	1.2	1.02	.82	1.03	1.04	1.53	221.2	11.44	415
D	20:53	813.1	811.2	801.3	20.3	7.6	101	2520	16666	2635	81.3	1.04	1.10	25.9	27.1	.35	.45	1.2	.98	.82	1.03	1.04	1.53	221.7	11.49	415
D	20:56	814.1	812.7	802.2	18.2	7.3	100	2520	16945	2655	82.3	1.04	1.11	26.0	27.0	.35	.42	1.2	1.04	.82	1.03	1.04	1.53	223.1	11.55	414
D	21: 0	815.1	813.7	803.5	15.2	7.1	102	2310	16697	2617	83.1	1.04	1.11	26.0	27.1	.36	.42	1.2	1.05	.82	1.03	1.04	1.53	224.1	11.61	414
D	21:11	816.1	814.7	804.7	176.	6.9	91	2940	16634	2600	86.9	1.09	1.11	26.2	27.0	.36	.41	2.5	.88	.82	1.03	1.09	1.53	225.1	11.65	413
D	21:14	817.1	815.7	805.3	19.5	7.5	102	2730	17224	2620	83.5	1.09	1.11	26.2	27.0	.36	.41	2.5	.98	.82	1.03	1.09	1.53	226.1	11.69	412
D	21:16	818.1	816.7	806.2	25.5	8.6	103	2730	17869	2638	83.3	1.09	1.12	26.2	27.2	.36	.39	3.7	.90	.82	1.03	1.09	1.53	227.2	11.73	411
D	21:20	819.2	817.7	806.5	20.1	9.2	103	2730	16976	2638	82.7	1.09	1.12	26.2	27.4	.36	.39	5.0	.97	.82	1.03	1.09	1.53	228.2	11.79	411
D	21:23	820.1	818.8	807.1	14.1	8.7	107	2730	17193	2638	82.3	1.09	1.11	26.2	27.5	.36	.38	3.7	1.04	.82	1.03	1.09	1.53	229.2	11.85	411
D	21:26	821.1	819.8	808.3	16.7	8.4	106	2520	16603	2656	82.7	1.09	1.11	26.2	27.5	.37	.39	3.7	1.01	.82	1.03	1.09	1.53	230.2	11.91	410
D	21:30	822.1	820.7	809.9	14.5	8.1	106	2520	16852	2676	82.5	1.09	1.12	26.3	27.4	.37	.38	5.0	1.06	.82	1.03	1.09	1.53	231.1	11.97	410
D	21:34	823.1	821.7	811.1	18.8	8.5	103	2730	16914	2638	82.1	1.09	1.12	26.3	27.2	.36	.38	3.7	.97	.82	1.03	1.09	1.53	232.2	12.03	410
D	21:38	824.1	822.7	812.3	15.9	8.8	103	2730	17121	2656	82.1	1.09	1.12	26.3	27.2	.36	.38	3.7	1.03	.82	1.03	1.09	1.53	233.1	12.09	410
D	21:50	825.1	823.7	814.7	15.2	8.3	101	2730	16440	2598	83.3	1.09	1.13	26.4	26.4	.36	.38	5.0	1.03	.82	1.03	1.09	1.53	234.1	12.17	409
D	21:54	826.1	824.7	815.3	16.2	7.8	103	2520	16666	2600	81.3	1.09	1.14	26.4	27.1	.35	.38	5.0	1.00	.82	1.03	1.09	1.53	235.2	12.23	410
D	21:57	827.1	825.7	816.3	18.8	9.8	100	2730	16790	2618	80.7	1.09	1.13	26.4	27.3	.35	.38	3.7	.99	.82	1.03	1.09	1.53	236.1	12.28	409
D	21:59	828.1	826.7	817.5	28.5	8.5	101	2730	16976	2600	80.7	1.09	1.13	26.3	27.5	.35	.39	3.7	.97	.82	1.03	1.09	1.53	237.1	12.33	409
D	22: 2	829.1	827.7	818.4	21.5	6.5	103	2520	15455	2598	80.7	1.09	1.13	26.4	27.5	.35	.38	3.7	.93	.82	1.03	1.09	1.53	238.2	12.38	408
D	22: 5	830.1	828.7	819.3	21.9	7.7	102	2520	16976	2600	80.7	1.09	1.13	26.4	27.6	.35	.39	3.7	.93	.82	1.03	1.09	1.53	239.2	12.42	407
D	22: 8	831.2	829.7	819.9	20.7	7.9	100	2730	16293	2598	80.5	1.09	1.12	26.4	27.5	.35	.39	5.0	.95	.82	1.03	1.09	1.53	240.1	12.47	407
D	22:10	832.1	830.7	820.2	22.6	7.2	102	2520	17472	2595	79.7	1.09	1.12	26.4	27.6	.35	.40	3.7	.92	.82	1.03	1.09	1.53	241.2	12.50	406
D	22:12	833.1	831.8	821.1	29.9	8.8	101	2730	16603	2615	79.3	1.09	1.12	26.4	27.7	.35	.40	3.7	.87	.82	1.03	1.09	1.53	242.2	12.54	405
D	22:25	834.1	832.7	823.0	6.6	9.1	86	2940	16076	2514	81.9	1.09	1.12	26.5	27.0	.35	.42	5.0	1.23	.82	1.03	1.09	1.53	243.1	12.63	406
D	22:29	835.2	833.7	823.9	16.3	7.6	88	2940	16516	2524	80.9	1.09	1.12	26.5	27.8	.35	.40	3.7	.98	.82	1.03	1.09	1.53	244.2	12.70	406
D	22:33	836.1	834.7	824.8	16.2	8.7	91	2730	16138	2489	80.9	1.09	1.12	26.5	27.9	.35	.40	3.7	.99	.82	1.03	1.09	1.53	245.2	12.76	406
D	22:36	837.1	835.7	824.8	22.5	9.8	89	2730	15517	2522	80.9	1.09	1.12	26.5	28.1	.35	.40	3.7	.92	.82	1.03	1.09	1.53	246.2	12.81	405
D	22:39	838.1	836.7	825.1	18.6	7.2	92	2730	15890	2524	81.1	1.09	1.12	26.5	28.2	.35	.41	3.7	.94	.82	1.03	1.09	1.53	247.1	12.85	404
D	22:41	839.2	837.7	825.7	21.2	7.7	92	2520	15579	2586	80.9	1.09	1.11	26.5	28.3	.35	.40	3.7	.92	.82	1.03	1.09	1.53	248.2	12.90	404
D	22:44	840.1	838.7	826.6	24.4	9.5	88	2730	15579	2522	80.9	1.09	1.11	26.6	28.2	.35	.40	3.7	.88	.82	1.03	1.09	1.53	249.2	12.94	403
D	22:48	841.1	839.7	828.1	12.6	9.8	91	2730	15207	2524	81.5	1.09	1.12	26.6	28.2	.36	.40	3.7	1.06	.82	1.03	1.09	1.53	250.1	13.01	403

GEOSERVICES — HAMMERHEAD #1 — DATE : 3/ 6/02

ON-LINE TDC

BIT#12 RUN#25 HTC J1 BIT DIAMETER : 12.25 inch NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 3 YP = 4 GEL = 3

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	tpm		KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	22:54	842.1	840.7	830.3	15.5	9.1	92	2730	16306	2506	81.1	1.10	1.11	26.8	28.3	.35	.40	3.7	1.02	.82	1.03	1.10	1.53	251.2	13.1	4
D	23: 4	843.2	841.2	832.4	13.7	.0	76	1090	18124	2610	86.9	1.10	1.12	26.9	28.2	.36	.40	5.0	1.05	.82	1.03	1.10	1.53	251.6	13.15	40-
D	23: 9	844.1	842.7	833.3	14.9	9.6	95	2520	16945	2656	81.9	1.10	1.12	26.9	28.0	.36	.39	3.7	1.03	.82	1.03	1.10	1.53	253.2	13.24	404
D	23:14	845.1	843.7	834.5	10.7	6.7	97	2310	17317	2658	81.7	1.10	1.12	27.1	28.4	.36	.40	3.7	1.06	.82	1.03	1.10	1.53	254.2	13.32	404
D	23:18	846.1	844.7	835.5	13.5	8.9	96	2520	17969	2676	81.1	1.10	1.12	27.0	28.4	.36	.40	3.7	1.07	.82	1.03	1.10	1.54	255.2	13.38	404
D	23:23	847.1	845.7	837.3	12.5	8.3	93	2520	17659	2676	81.7	1.10	1.12	27.1	28.4	.36	.40	5.0	1.04	.82	1.03	1.10	1.54	256.1	13.47	404
D	23:28	848.1	846.7	839.4	12.8	7.0	97	2520	17193	2661	81.9	1.10	1.12	27.2	28.5	.36	.41	5.0	1.03	.82	1.03	1.10	1.54	257.2	13.55	404
D	23:38	849.1	847.7	840.6	15.3	10.1	93	2520	17038	2658	81.3	1.10	1.12	27.3	28.4	.36	.41	5.0	1.01	.82	1.03	1.10	1.54	258.1	13.62	405
D	23:42	850.2	848.7	841.2	12.0	8.9	93	2520	17100	2658	81.3	1.10	1.12	27.3	28.5	.36	.40	5.0	1.07	.82	1.03	1.10	1.54	259.2	13.69	405
D	23:46	851.1	849.7	842.5	15.6	8.8	93	2730	17410	2670	80.9	1.10	1.11	27.4	28.5	.36	.41	5.0	1.00	.82	1.03	1.10	1.54	260.2	13.76	405
T	0: 6	851.9	850.2	842.8	----	----	0	630.	-1179	0	91.9	1.10	1.17	27.5	28.4	.35	.35	6.2	----------		----------			----------		
D	0:15	852.4	851.0	844.0	9.0	-.3	0	1680	17348	2617	81.7	1.10	1.12	27.5	28.4	.36	.40	3.7	.60	.82	1.30	1.10	1.73	261.5	13.88	405
D	0:15	853.3	851.9	844.0	239.	-.8	0	1680	17597	2635	81.3	1.10	1.12	27.5	28.6	.36	.40	3.7	.80	.82	1.03	1.10	1.54	262.3	13.88	404
D	0:16	854.2	852.8	844.3	185.	-.9	0	1470	17045	2637	81.1	1.10	1.12	27.5	28.7	.36	.40	3.7	.00	.82	1.03	1.10	1.54	263.3	13.89	403
D	0:18	855.1	853.7	844.9	20.8	7.8	0	2730	16790	2658	79.9	1.10	1.12	27.5	29.1	.36	.40	3.7	-.60	.82	1.03	1.10	1.54	264.2	13.93	402
D	0:23	856.1	854.7	845.8	9.9	8.0	100	2520	15921	2599	79.5	1.10	1.12	27.4	29.0	.36	.40	3.7	1.10	.82	1.03	1.10	1.54	265.2	14.01	402
D	0:30	857.1	855.7	847.3	10.0	9.2	100	2310	17577	2620	77.5	1.10	1.12	27.4	27.4	.36	.40	3.7	1.13	.82	1.03	1.10	1.54	266.2	14.12	403
D	0:35	858.1	856.2	848.0	13.0	7.7	100	2310	18590	2643	76.5	1.10	1.11	27.4	29.3	.35	.40	3.7	1.04	.82	1.03	1.10	1.54	266.7	14.20	403
D	0:40	859.2	857.7	849.2	11.5	6.7	100	2520	18240	2658	75.9	1.10	1.12	27.5	29.2	.35	.41	3.7	1.07	.82	1.03	1.10	1.54	268.2	14.30	404
T	1: 0	860.0	858.2	851.9	----	----	100	630.	17907	2500	75.1	1.10	1.12	27.7	30.6	.34	.40	3.7	----------		----------			----------		
T	1:20	860.0	858.2	856.2	----	----	0	.000	6300	1618	76.5	1.10	1.13	28.1	30.8	.34	.40	3.7	----------		----------			----------		
T	1:40	860.0	858.2	858.6	----	----	0	.000	6455	1615	76.5	1.10	1.13	28.4	30.3	.34	.39	3.7	----------		----------			----------		
T	2: 0	860.0	858.2	859.0	----	----	0	.000	6672	1638	77.1	1.10	1.13	28.7	27.2	.34	.39	3.7	----------		----------			----------		
T	2:20	860.0	858.2	859.8	----	----	0	.000	6610	1638	76.1	1.10	1.14	28.8	27.5	.34	.39	5.0	----------		----------			----------		
T	2:41	860.0	858.2	859.8	----	----	100	1090	18590	1389	74.3	1.10	1.12	28.7	29.4	.34	.39	2.5	----------		----------			----------		
D	2:41	860.2	858.7	859.8	6.4	9.8	100	2520	18528	2618	74.3	1.10	1.12	28.6	29.3	.34	.40	1.2	1.13	.82	1.03	1.10	1.54	269.1	14.42	405
D	2:45	861.1	859.2	859.8	13.1	8.4	100	1090	18776	2618	74.1	1.10	1.13	28.6	28.5	.34	.40	1.2	1.05	.82	1.03	1.10	1.54	269.6	14.48	405
D	2:48	862.2	860.7	859.8	20.6	8.9	100	1090	18745	2635	74.1	1.10	1.12	28.6	28.6	.34	.40	2.5	.93	.82	1.03	1.10	1.54	271.2	14.54	405
D	2:53	863.1	861.6	859.8	13.8	8.8	100	1090	18931	2675	74.1	1.10	1.13	28.6	28.5	.34	.40	1.2	1.05	.82	1.03	1.10	1.54	272.1	14.61	405
D	3: 6	864.1	862.7	859.8	5.7	8.5	100	1090	19117	2640	73.9	1.10	1.12	28.5	28.6	.34	.39	1.2	1.16	.82	1.03	1.10	1.54	273.1	14.65	404
D	3:10	865.1	863.7	859.8	17.9	9.1	100	2100	18993	2620	73.7	1.10	1.13	28.4	28.4	.34	.40	1.2	1.00	.82	1.03	1.10	1.54	274.2	14.71	404
D	3:15	866.1	864.7	859.8	14.4	6.6	100	1680	19806	2638	73.9	1.10	1.12	28.2	28.6	.34	.40	.0	1.00	.82	1.03	1.10	1.54	275.1	14.79	404
D	3:19	867.1	865.7	859.8	13.0	8.3	100	2100	19117	2656	74.1	1.10	1.13	28.1	28.9	.34	.40	.0	1.02	.82	1.03	1.10	1.54	276.2	14.87	405
D	3:23	868.1	866.7	859.8	15.8	7.9	100	1090	19117	2638	74.1	1.10	1.13	28.1	29.1	.34	.40	1.2	1.00	.82	1.03	1.10	1.54	277.1	14.93	405
D	3:27	869.2	867.7	860.1	13.0	6.1	100	1680	19140	2656	74.1	1.10	1.12	28.0	29.4	.35	.41	.0	1.00	.82	1.03	1.10	1.54	278.1	15.00	404
D	3:32	870.1	868.7	861.4	10.9	7.6	100	1090	18869	2635	74.7	1.10	1.12	27.9	29.4	.34	.41	1.2	1.07	.82	1.03	1.10	1.54	279.1	15.08	405
D	3:51	871.1	869.6	863.5	14.5	5.7	100	1680	17503	2524	75.7	1.10	1.13	27.9	28.8	.34	.41	1.2	.96	.82	1.03	1.10	1.54	280.1	15.15	405
D	3:55	872.2	870.7	863.8	15.6	6.6	100	1680	17317	2524	74.7	1.10	1.13	27.9	29.4	.34	.40	1.2	.99	.82	1.03	1.10	1.54	281.2	15.22	404
D	3:59	873.2	871.7	864.1	12.7	9.8	100	2310	17410	2524	74.5	1.10	1.13	28.0	29.8	.34	.40	1.2	1.02	.82	1.03	1.10	1.54	282.1	15.29	405
D	4: 3	874.1	872.7	865.0	16.2	8.3	97	1090	17193	2524	74.9	1.10	1.13	27.9	29.9	.34	.41	2.5	1.00	.82	1.03	1.10	1.54	283.2	15.36	404
D	4:10	875.1	873.7	866.2	7.0	8.4	96	2100	17193	2524	75.3	1.10	1.13	28.1	29.8	.35	.41	1.2	1.10	.82	1.03	1.10	1.54	284.2	15.46	405
D	4:14	876.1	874.7	867.5	12.1	10.5	95	2310	17255	2542	75.1	1.10	1.13	28.1	29.8	.35	.41	1.2	1.06	.82	1.03	1.10	1.54	285.1	15.53	405
D	4:18	877.1	875.7	868.4	13.0	8.6	95	2310	17162	2524	75.3	1.10	1.13	28.2	29.9	.35	.41	1.2	1.05	.82	1.03	1.10	1.54	286.1	15.60	405
D	4:23	878.2	876.7	869.0	15.5	8.1	94	2100	17069	2539	74.9	1.10	1.13	28.3	29.8	.35	.40	1.2	1.01	.82	1.03	1.10	1.54	287.2	15.67	405
D	4:26	879.1	877.7	869.9	18.4	8.9	96	2100	17173	2542	75.1	1.10	1.13	28.4	29.6	.35	.40	2.5	.97	.82	1.03	1.10	1.54	288.2	15.73	405
D	4:41	880.1	878.7	870.8	13.8	8.6	101	2100	18186	2599	75.9	1.10	1.13	28.4	29.7	.35	.40	1.2	1.02	.82	1.03	1.10	1.54	289.1	15.80	405
D	4:46	881.1	879.6	872.0	12.4	9.0	104	1090	18155	2599	76.1	1.10	1.13	28.5	29.8	.35	.40	3.7	1.08	.82	1.03	1.10	1.54	290.1	15.88	405
D	4:52	882.2	880.6	873.6	10.3	9.4	104	1090	17690	2597	76.1	1.10	1.13	28.5	30.1	.35	.40	3.7	1.12	.82	1.03	1.10	1.54	291.1	15.98	406
D	4:55	883.1	881.2	874.2	15.8	9.6	102	1090	17969	2620	76.3	1.10	1.13	28.5	29.9	.35	.41	3.7	1.03	.82	1.03	1.10	1.54	292.2	16.03	405

GEOSERVICES — HAMMERHEAD #1 — DATE : 4/ 6/02

ON-LINE TDC

BIT#12 RUN#25 HTC J1 BIT DIAMETER : [illegible] inch NOZZ 13/13/13 MUD RHEOLOGICAL PARAMETE PV = 5 YP = 4 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	ACCUMULATED ON BIT TIME	ACCUMULATED ON BIT COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	5: 1	884.2	882.7	875.4	9.3	9.0	103	2100	18000	2599	75.9	1.10	1.13	28.7	30.0	.35	.42	2.5	1.15	.82	1.03	1.10	1.55	293.2	16.14	406
D	5: 7	885.2	883.7	876.6	9.4	9.3	103	1890	17721	2617	75.9	1.10	1.13	28.6	30.0	.35	.41	3.7	1.15	.82	1.03	1.10	1.55	294.2	16.23	407
D	5:12	886.1	884.6	877.8	27.3	8.9	102	2100	18124	2600	75.5	1.10	1.12	28.8	30.1	.35	.41	3.7	.90	.82	1.03	1.10	1.55	295.1	16.31	407
D	5:14	887.1	885.7	878.4	22.3	9.0	104	2100	18093	2630	75.7	1.10	1.13	28.8	30.4	.35	.41	3.7	.94	.82	1.03	1.10	1.55	296.2	16.35	406
D	5:18	888.1	886.7	879.3	18.2	9.0	103	1890	18031	2617	75.5	1.10	1.13	28.8	30.1	.35	.42	3.7	.98	.82	1.03	1.10	1.55	297.2	16.41	406
D	5:32	889.1	887.6	880.6	17.3	9.0	102	2100	18031	2617	75.7	1.10	1.13	28.8	30.4	.35	.41	3.7	.99	.82	1.03	1.10	1.55	298.1	16.49	406
D	5:36	890.1	888.6	881.5	16.8	8.4	104	1890	18031	2600	75.7	1.10	1.13	28.8	30.2	.35	.42	5.0	1.02	.82	1.03	1.10	1.55	299.1	16.56	406
D	5:40	891.1	889.7	881.8	16.8	9.3	102	2310	17814	2600	75.7	1.10	1.13	28.8	30.5	.35	.43	3.7	1.00	.82	1.03	1.10	1.55	300.2	16.62	406
D	5:43	892.1	890.6	882.7	17.6	9.0	103	2100	17907	2577	75.3	1.10	1.12	28.9	30.4	.35	.43	3.7	1.00	.82	1.03	1.10	1.55	301.1	16.68	406
D	5:47	893.2	891.7	883.6	18.7	9.3	103	2100	17814	2600	75.5	1.10	1.12	29.0	30.3	.35	.41	3.7	.99	.82	1.03	1.10	1.55	302.2	16.74	406
D	5:51	894.1	892.7	883.9	16.7	8.8	103	1890	17752	2597	75.3	1.10	1.12	29.0	30.4	.35	.42	5.0	1.00	.82	1.03	1.10	1.55	303.2	16.80	406
D	5:55	895.1	893.7	884.8	13.7	8.4	104	1890	17930	2610	75.1	1.10	1.13	29.0	30.4	.35	.41	5.0	1.05	.83	1.03	1.10	1.55	304.2	16.87	406
D	6: 0	896.1	894.7	886.1	11.2	9.0	103	1890	17814	2597	75.5	1.10	1.12	29.1	30.7	.35	.42	5.0	1.00	.83	1.03	1.10	1.55	305.2	16.95	406

ON-LINE TDC
GEOSERVICES BIT REPORT

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ON-LINE TDC
GEOSERVICES HYDRAULIC REPORT

4/ 6/82 TIME 6: 7 HAMMERHEAD #1

DEPTH OF EXECUTION 898.68 METERS
FLOW RATE 2597 L/MN BINGHAM

MUD DATA	WEIGHT	1.10	SG
————	PV	5	CPS
	YP	4.00	LB/FT2
	GEL	2.00	LB/100 FT2
	N	.7776	
	K	.0540	LB/100 FT2
HOLES VOLUMES	WITH PIPES	114.35	M3
————————	WITHOUT PIPES	119.43	M3
	ANNULAR	106.49	M3
	INSIDE PIPES	7.86	M3

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						461	27				
DR.STRING	.00	809.60	4.28	5.00		1467	85				
DR.STRING	809.60	898.40	2.81	7.75		1207	70				
BIT						18144	1053	H/S		172.7	
ANNULUS	896.60	807.80		7.75	12.25	11	1	TU	1925.5	57.0	52.4
ANNULUS	807.80	554.00		5.00	12.25	11	1	LA	2615.3	41.0	36.7
ANNULUS	554.00	143.00		5.00	18.73	9	1	LA	6693.1	15.7	12.0
ANNULUS	143.00	.00		5.00	16.75	4	0	LA	5260.6	20.1	16.2
TOTAL						21315	1237				

ANNULAR PRESSURE LOSSES 35 KPA

EQUIV.CIRCULATING DENSITY 1.10 SG
MAX DEPTH 2878.56

MUD LAG TIMES	S -> B	3.03	MN
————————	B -> S	41.00	MN
CUTTINGS DATA	SIZE	.20	CM
————————	DENSITY	2.40	SG
	LAG TIME	51.04	MN
	MAX SLIP VELOCITY	4.52	M/MN
BIT DATA	SIZE	12.25	INCH
————	NOZZLES	13 13 13	/32NDS
	NOZZLES EFFICIENCY	95	%
	BIT P. LOSSES	18144	KPA
	H.H.P RATIO	85.13	%
	BIT H.H.P	8.938	
	BIT VELOCITY	172.66	M/S

GEOSERVICES — HAMMERHEAD #1 — DATE : 4/ 6/82

ON-LINE TDC

BIT#12 RUN#25 HTC J1 — BIT DIAMETER : 12.25 inch — NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 5 YP = 4 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	6:14	899.3	897.8	887.9	13.6	9.5	91	2310	17503	2562	77.9	1.10	1.13	29.1	30.3	.35	.42	5.0	1.06	.83	1.03	1.10	1.55	308.3	17.00	403
D	6:18	900.2	898.6	889.4	11.6	6.9	93	1680	17340	2600	75.3	1.10	1.13	29.1	30.4	.35	.42	5.0	1.03	.83	1.03	1.10	1.55	309.2	17.06	403
D	6:23	901.2	899.6	890.9	12.9	6.9	95	1680	17703	2582	75.1	1.10	1.12	29.1	30.5	.35	.41	5.0	1.01	.83	1.03	1.10	1.55	310.2	17.16	403
D	6:28	902.1	900.7	892.2	15.4	6.8	98	1680	17659	2597	74.9	1.10	1.12	29.2	30.9	.35	.42	5.0	.97	.83	1.03	1.10	1.55	311.2	17.23	403
D	6:33	903.1	901.6	893.4	10.2	5.8	101	1470	17379	2620	75.3	1.10	1.13	29.3	30.7	.35	.43	5.0	1.02	.83	1.03	1.10	1.55	312.1	17.31	403
D	6:37	904.1	902.6	894.3	12.8	7.1	97	1890	17614	2600	75.3	1.10	1.13	29.3	30.9	.35	.42	5.0	1.00	.83	1.03	1.10	1.55	313.1	17.37	403
D	6:43	905.1	903.6	895.5	7.8	8.8	95	2100	17628	2600	75.1	1.10	1.12	29.3	31.1	.35	.42	5.0	1.12	.83	1.03	1.10	1.55	314.1	17.48	404
D	6:49	906.1	904.2	898.9	10.3	7.9	96	1890	17597	2620	75.1	1.10	1.13	29.4	30.9	.35	.41	3.7	1.07	.83	1.03	1.10	1.55	314.7	17.58	404
D	6:55	907.1	905.6	898.9	8.3	6.6	100	1680	17566	2617	75.1	1.10	1.13	29.5	31.0	.36	.42	3.7	1.10	.83	1.03	1.10	1.55	316.2	17.69	405
D	7: 1	908.1	906.6	899.8	10.3	7.6	96	1890	17317	2600	74.9	1.10	1.12	29.5	31.1	.36	.42	5.0	1.08	.83	1.03	1.10	1.55	317.1	17.78	406
D	7:12	909.1	907.6	901.3	25.9	8.7	96	2100	17690	2600	75.9	1.10	1.13	29.6	30.9	.35	.42	5.0	.76	.83	1.03	1.10	1.55	318.1	17.85	406
D	7:17	910.1	908.6	902.2	14.8	8.1	96	1890	17645	2597	75.1	1.10	1.12	29.7	30.8	.36	.42	5.0	1.01	.83	1.03	1.10	1.55	319.2	17.92	406
D	7:21	911.1	909.7	903.4	14.8	8.4	101	2100	17628	2620	74.7	1.10	1.12	29.8	31.1	.35	.42	5.0	1.01	.83	1.03	1.10	1.55	320.2	17.99	406
D	7:25	912.1	910.6	904.0	19.4	7.9	98	1890	17566	2607	74.1	1.10	1.12	29.7	31.0	.36	.42	3.7	.94	.83	1.03	1.10	1.55	321.2	18.05	406
D	7:28	913.2	911.6	904.6	17.8	7.0	101	1680	17690	2597	74.3	1.10	1.13	29.8	30.8	.36	.43	3.7	.95	.83	1.03	1.10	1.55	322.1	18.11	405
D	7:33	914.1	912.6	905.3	9.5	8.8	97	2100	17193	2615	74.1	1.10	1.12	29.8	31.0	.36	.42	3.7	1.10	.83	1.03	1.10	1.55	323.1	18.19	406
D	7:39	915.1	913.6	906.5	10.3	8.4	101	1890	17441	2600	73.9	1.10	1.11	29.8	31.0	.36	.43	5.0	1.10	.83	1.03	1.10	1.55	324.2	18.29	406
D	7:42	916.1	914.6	906.8	21.1	8.2	101	2100	17100	2600	73.5	1.10	1.11	29.8	31.0	.36	.43	5.0	.91	.83	1.03	1.10	1.55	325.2	18.34	406
D	7:45	917.1	915.7	907.4	20.2	8.3	98	1890	17659	2600	74.1	1.10	1.11	29.8	31.2	.36	.43	5.0	.93	.83	1.03	1.10	1.55	326.2	18.39	405
D	7:48	918.1	916.7	907.7	19.4	8.0	102	1890	17628	2600	74.3	1.10	1.11	29.8	30.9	.36	.43	5.0	.94	.83	1.03	1.10	1.55	327.2	18.44	405
T	8:18	917.6	916.7	909.2	----	----	0	.000	-1241	0	79.3	1.10	1.16	29.8	32.9	.36	.37	6.2	----------		----------			----------		
T	8:38	918.0	916.7	910.4	----	----	106	1680	18559	2600	74.5	1.10	1.11	29.7	27.9	.35	.46	2.5	----------		----------			----------		
D	8:42	919.1	917.6	911.4	9.5	8.4	105	1890	18372	2620	74.1	1.10	1.11	29.8	31.2	.35	.41	2.5	1.07	.83	1.03	1.10	1.55	328.1	18.58	406
D	8:45	920.1	918.6	912.6	15.9	7.8	105	1890	18062	2620	73.5	1.10	1.11	29.8	31.5	.36	.42	2.5	1.00	.83	1.03	1.10	1.55	328.6	18.63	406
D	8:49	921.1	920.1	913.5	13.9	7.6	107	1680	17969	2617	73.9	1.10	1.11	29.8	31.6	.36	.42	2.5	1.04	.83	1.03	1.10	1.55	330.1	18.78	406
D	8:55	922.1	921.2	914.4	12.0	8.4	106	1890	18000	2618	73.9	1.10	1.12	29.7	31.4	.36	.44	2.5	1.09	.83	1.03	1.10	1.56	331.1	18.79	406
D	9: 3	923.1	922.1	916.8	7.2	8.2	106	1890	18000	2635	73.7	1.10	1.11	29.7	31.2	.36	.44	3.7	1.21	.83	1.03	1.10	1.56	332.1	18.92	407
D	9: 9	924.1	923.1	918.1	9.9	8.6	105	1890	16976	2641	73.7	1.10	1.11	29.8	31.3	.36	.44	2.5	1.14	.83	1.03	1.10	1.56	333.1	19.01	408
D	9:14	925.1	924.1	918.1	11.8	8.4	105	1890	18000	2635	73.7	1.10	1.11	29.8	31.2	.36	.43	2.5	1.09	.83	1.03	1.10	1.56	334.1	19.09	408
D	9:19	926.1	925.2	917.4	11.3	9.4	105	1890	17938	2620	73.5	1.10	1.11	29.9	31.2	.36	.43	3.7	1.10	.83	1.03	1.10	1.56	335.1	19.18	408
D	9:33	927.1	926.1	920.2	10.1	8.3	106	1890	17131	2562	73.1	1.10	1.11	30.0	31.7	.36	.44	3.7	1.10	.83	1.03	1.10	1.56	336.0	19.28	409
D	9:38	928.1	927.1	921.1	9.7	7.3	108	1680	16697	2562	75.5	1.10	1.11	30.0	31.8	.36	.44	2.5	1.11	.83	1.03	1.10	1.56	337.1	19.37	409
D	9:44	929.2	928.1	922.3	10.8	8.9	107	1890	15952	2600	75.7	1.10	1.12	30.0	31.5	.37	.43	2.5	1.08	.83	1.03	1.10	1.56	338.0	19.48	410
D	9:51	930.1	928.6	922.9	12.1	8.2	106	1890	15207	2600	75.9	1.10	1.11	30.1	31.6	.37	.43	3.7	1.07	.83	1.03	1.10	1.56	338.6	19.58	410
D	9:59	931.2	930.1	924.5	9.0	7.8	107	1680	15052	2600	76.7	1.10	1.11	30.2	31.5	.37	.44	3.7	1.16	.83	1.03	1.10	1.56	340.1	19.71	411
D	10: 7	932.1	931.1	926.0	7.7	7.7	106	1890	15672	2562	76.3	1.10	1.12	30.3	31.4	.37	.44	2.5	1.20	.83	1.03	1.10	1.56	341.0	19.84	413
D	10:11	933.1	932.1	926.0	16.5	8.1	105	1890	16014	2562	76.1	1.10	1.12	30.3	31.5	.37	.44	2.5	1.00	.83	1.03	1.10	1.56	342.0	19.91	413
D	10:16	934.1	932.6	926.9	15.6	9.6	106	1890	15734	2580	75.1	1.10	1.12	30.3	31.4	.36	.44	2.5	1.01	.83	1.03	1.10	1.56	342.6	19.99	413
D	10:23	935.1	934.1	928.1	10.3	8.6	110	1890	16790	2577	75.1	1.10	1.12	30.3	31.4	.36	.44	3.7	1.11	.83	1.03	1.10	1.56	344.1	20.10	413
D	10:37	936.1	935.1	929.6	7.5	9.3	108	1890	18000	2630	75.1	1.10	1.11	30.4	31.6	.35	.45	2.5	1.16	.83	1.03	1.10	1.56	345.1	20.21	414
D	10:42	937.1	935.6	930.6	9.7	8.7	107	1890	17721	2658	74.7	1.10	1.11	30.4	31.9	.35	.44	2.5	1.14	.83	1.03	1.10	1.56	345.6	20.30	414
D	10:49	938.1	936.7	931.2	9.0	9.1	106	1680	17076	2638	73.9	1.10	1.12	30.5	31.6	.35	.43	1.2	1.14	.83	1.03	1.10	1.56	346.6	20.41	415
D	10:55	939.1	938.2	932.1	13.5	8.7	105	2100	17534	2638	73.3	1.10	1.12	30.5	31.5	.36	.43	2.5	1.05	.83	1.03	1.10	1.56	348.1	20.51	415
D	11: 2	940.1	939.2	933.6	9.6	8.6	107	1890	17534	2676	74.1	1.10	1.12	30.5	31.4	.36	.42	2.5	1.12	.83	1.03	1.10	1.56	349.1	20.62	416
D	11: 7	941.1	940.1	934.5	13.1	7.9	106	1890	17534	2638	74.1	1.10	1.13	30.5	31.3	.35	.42	2.5	1.06	.83	1.03	1.10	1.56	350.0	20.70	416
D	11:11	942.2	941.1	935.1	13.9	8.6	106	1890	17597	2658	74.1	1.10	1.13	30.5	31.6	.35	.42	2.5	1.04	.83	1.03	1.10	1.56	351.0	20.77	416
D	11:15	943.1	942.2	935.4	11.6	8.9	108	1680	17597	2643	74.1	1.10	1.13	30.6	31.6	.35	.42	2.5	1.10	.83	1.03	1.10	1.56	352.1	20.84	416
D	11:21	944.2	943.1	936.8	10.1	9.2	106	1890	17614	2678	73.3	1.10	1.13	30.5	31.4	.35	.41	2.5	1.12	.83	1.03	1.10	1.56	353.1	20.94	417
D	11:35	945.1	944.1	937.9	7.2	8.6	109	1680	17286	2676	73.1	1.10	1.13	30.5	31.3	.35	.42	2.5	1.20	.83	1.03	1.10	1.56	354.0	21.04	417

GEOSERVICES — HAMMERHEAD #1 — DATE : 4/ 6/82

ON-LINE TDC

BIT#12 RUN#25 HTC J1 — BIT DIAMETER : 12.25 inch — NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 7 YP = 7 GEL = 3

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	DRILLING PARAMETERS ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	11:43	946.1	945.2	939.1	7.2	10.9	106	2310	17340	2638	72.1	1.10	1.12	30.5	31.9	.35	.39	1.2	1.23	.83	1.03	1.10	1.56	355.1	21.17	418
D	11:48	947.1	946.1	940.0	10.3	8.6	107	1600	17045	2615	73.7	1.10	1.12	30.5	32.0	.35	.41	1.2	1.14	.83	1.03	1.10	1.56	356.1	21.25	418
D	11:56	948.1	947.1	941.5	9.4	7.2	110	1600	17703	2638	71.9	1.10	1.12	30.5	32.0	.34	.40	1.2	1.11	.83	1.03	1.10	1.56	357.1	21.39	419
D	12: 6	949.1	948.1	943.7	5.8	6.5	111	1470	17907	2623	72.9	1.10	1.12	30.7	32.2	.34	.40	2.5	1.21	.83	1.03	1.10	1.56	358.1	21.56	421
D	12:16	950.1	949.1	944.6	6.4	7.0	101	1470	17410	2656	72.1	1.10	1.13	30.7	32.0	.35	.40	1.2	1.10	.83	1.03	1.10	1.56	359.1	21.72	422
D	12:25	951.1	950.1	945.8	8.1	8.0	101	1600	17566	2638	71.3	1.10	1.12	30.8	31.9	.35	.39	1.2	1.13	.83	1.03	1.10	1.56	360.1	21.87	423
D	12:34	952.1	951.1	947.3	7.6	8.0	100	1600	17566	2635	71.1	1.10	1.12	30.7	32.0	.35	.39	2.5	1.15	.83	1.03	1.10	1.56	361.0	22.02	425
D	12:40	953.1	952.1	947.9	9.9	8.4	99	1600	17441	2638	70.7	1.10	1.13	30.7	32.1	.35	.39	2.5	1.10	.83	1.03	1.10	1.56	362.0	22.12	425
D	12:54	954.1	953.1	949.1	8.6	6.9	100	1600	16293	2546	70.9	1.10	1.12	30.8	31.9	.35	.39	2.5	1.09	.83	1.03	1.10	1.56	363.1	22.22	426
D	13: 1	955.1	954.1	949.5	9.7	7.5	97	1090	15952	2577	70.9	1.10	1.12	30.7	32.5	.35	.39	3.7	1.09	.83	1.03	1.10	1.56	364.1	22.32	426
D	13: 9	956.1	955.1	950.7	9.3	7.6	98	1070	16045	2561	70.5	1.10	1.12	30.8	32.2	.35	.39	2.5	1.09	.83	1.03	1.10	1.56	365.0	22.46	427
D	13:16	957.1	956.1	951.3	8.4	8.9	97	1090	16208	2564	72.9	1.10	1.12	30.8	32.2	.35	.39	2.5	1.14	.83	1.03	1.10	1.56	366.1	22.57	428
D	13:22	958.1	957.1	951.9	12.7	8.0	97	1090	17069	2617	72.5	1.10	1.12	30.9	32.1	.35	.39	2.5	1.01	.83	1.03	1.10	1.56	367.1	22.67	428
D	13:25	959.1	957.6	952.5	15.0	7.3	100	1600	16914	2599	72.7	1.10	1.12	30.9	32.3	.35	.39	2.5	.99	.83	1.03	1.10	1.56	367.6	22.73	428
D	13:31	960.1	959.1	953.4	12.2	8.5	99	1600	16945	2599	73.9	1.10	1.12	30.9	32.2	.35	.39	2.5	1.05	.83	1.03	1.10	1.56	369.1	22.83	428
D	13:38	961.1	960.1	954.0	8.1	8.6	97	1600	17193	2582	73.5	1.10	1.12	31.0	32.1	.35	.40	2.5	1.13	.83	1.03	1.10	1.56	370.1	22.94	429
D	13:46	962.1	961.1	954.9	8.5	8.4	97	1600	16803	2599	73.1	1.10	1.12	30.9	32.1	.35	.41	3.7	1.12	.83	1.03	1.10	1.57	371.1	23.07	430
D	13:58	963.2	962.1	956.2	10.1	8.1	94	1090	15983	2562	73.5	1.10	1.12	30.9	32.1	.35	.39	3.7	1.07	.83	1.03	1.10	1.57	372.1	23.15	430
D	14: 3	964.1	963.1	957.1	10.3	8.1	98	1600	16417	2557	73.3	1.10	1.12	30.9	32.4	.35	.40	3.7	1.09	.83	1.03	1.10	1.57	373.1	23.24	430
D	14:10	965.1	964.1	958.0	10.1	8.6	90	1600	16076	2554	73.3	1.10	1.12	30.9	32.7	.35	.40	2.5	1.09	.83	1.03	1.10	1.57	374.0	23.34	431
D	14:17	966.2	964.6	959.5	8.8	8.0	102	1600	16306	2592	73.1	1.10	1.13	30.9	32.4	.35	.40	3.7	1.14	.83	1.03	1.10	1.57	374.6	23.45	431
D	14:21	967.1	966.1	960.1	16.5	8.4	98	1090	16479	2524	72.9	1.10	1.12	30.9	32.4	.34	.39	3.7	.98	.83	1.03	1.10	1.57	376.1	23.52	431
D	14:24	968.2	966.7	960.7	16.7	8.8	96	1090	17503	2541	70.7	1.10	1.13	31.0	32.4	.33	.39	2.5	.97	.83	1.03	1.10	1.57	376.6	23.58	431
D	14:30	969.2	968.1	961.3	12.1	8.6	96	1600	17441	2544	71.3	1.10	1.12	31.0	32.2	.33	.39	3.7	1.03	.83	1.03	1.10	1.57	378.1	23.67	431

ON-LINE TDC
GEOSERVICES — HYDRAULIC REPORT

4/ 6/82 TIME 14:33 — HAMMERHEAD #1

DEPTH OF EXECUTION 969.67 METERS
FLOW RATE 2551 L/MN — POWER LAW

MUD DATA	WEIGHT	1.10 SG
	PV	7 CPS
	YP	7.00 LB/FT2
	GEL	3.00 LB/100 FT2
	N	.7105
	K	.1309 LB/100 FT2
HOLES VOLUMES	WITH PIPES	119.66 M3
	WITHOUT PIPES	124.98 M3
	ANNULAR	111.12 M3
	INSIDE PIPES	8.54 M3

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						443	25				
DR.STRING	.00	883.20	4.28	5.00		1545	88				
DR.STRING	883.20	972.00	2.81	7.75		1160	66				
BIT						17511	999	M/S		167.6	
ANNULUS	969.67	880.87	7.75	12.25	8	0	TU	1413.2	55.9	52.2	
ANNULUS	880.87	554.00	5.00	12.25	10	1	TU	1510.0	40.3	36.8	
ANNULUS	554.00	143.00	5.00	18.73	8	0	LA	2766.5	15.5	12.5	
ANNULUS	143.00	.00	5.00	16.75	1	0	TU	2364.8	19.7	16.6	
TOTAL						20686	1100				

ANNULAR PRESSURE LOSSES 27 KPA

EQUIV.CIRCULATING DENSITY 1.10 SG
MAX DEPTH 3328.36

MUD LAG TIMES	S -> B	3.35 MN
	B -> S	43.55 MN
CUTTINGS DATA	SIZE	.20 CM
	DENSITY	2.40 SG
	LAG TIME	52.02 MN
	MAX SLIP VELOCITY	3.72 M/MN
BIT DATA	SIZE	12.25 INCH
	NOZZLES	13 13 13 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	17511 KPA
	H.H.P RATIO	84.65 %
	BIT H.H.P	8.474
	BIT VELOCITY	169.61 M/S

GEOSERVICES — HAMMERHEAD #1 — DATE : 4/ 6/02

ON-LINE TDC

BIT#12 RUN#25 HTC J1 — BIT DIAMETER : 12.25 inch — NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 7 YP = 7 GEL = 3

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	Dhr	$/m
D	14:35	970.2	969.1	962.3	10.4	9.6	97	1680	17100	2542	71.7	1.10	1.13	31.0	32.4	.34	.39	3.7	1.09	.83	1.03	1.10	1.57	379.1	23.76	431
D	14:43	971.4	970.1	963.2	9.8	.0	0	-210	15952	2562	71.7	1.10	1.13	31.1	32.4	.34	.40	3.7	1.11	.83	1.03	1.10	1.57	380.1	23.88	432
D	14:55	972.2	971.1	964.1	17.8	8.4	100	1870	17162	2597	70.3	1.10	1.12	31.1	32.1	.34	.40	3.7	.95	.83	1.03	1.10	1.57	381.1	23.92	432
D	15: 2	973.1	972.2	965.3	7.0	8.8	100	1680	17628	2582	69.9	1.10	1.13	31.1	32.8	.34	.39	3.7	1.20	.83	1.03	1.10	1.57	382.1	24.04	432
D	15:10	974.2	973.1	966.8	8.2	8.4	101	1680	17472	2599	71.1	1.10	1.13	31.1	32.9	.34	.39	3.7	1.16	.83	1.03	1.10	1.57	383.1	24.17	433
D	15:18	975.1	974.1	968.7	7.7	9.6	100	1680	17703	2582	70.5	1.10	1.14	31.3	32.9	.33	.39	3.7	1.10	.83	1.03	1.10	1.57	384.1	24.30	434
D	15:29	976.2	975.1	970.0	6.1	9.5	101	1680	17534	2579	70.7	1.10	1.13	31.4	32.9	.33	.38	3.7	1.23	.83	1.03	1.10	1.57	385.1	24.46	436
D	15:36	977.1	976.1	971.1	7.9	9.3	100	1680	17597	2600	70.7	1.10	1.13	31.4	32.8	.33	.38	3.7	1.10	.83	1.03	1.10	1.57	386.1	24.60	436
D	15:42	978.1	977.1	972.3	9.2	8.4	101	1680	17503	2617	70.7	1.10	1.13	31.5	32.9	.33	.38	2.5	1.12	.83	1.03	1.10	1.57	387.1	24.70	437
D	15:49	979.2	978.1	973.2	7.3	9.8	101	1680	17162	2582	70.3	1.10	1.13	31.5	33.0	.34	.38	2.5	1.20	.83	1.03	1.10	1.57	388.1	24.82	437
D	15:56	980.2	979.1	974.1	9.8	9.4	100	1680	17255	2617	70.3	1.10	1.13	31.5	33.0	.34	.39	3.7	1.15	.83	1.03	1.10	1.57	389.1	24.93	438
D	16: 9	981.1	979.6	975.1	10.4	8.8	96	1680	17628	2599	70.3	1.10	1.14	31.5	32.4	.33	.38	2.5	1.13	.83	1.03	1.10	1.57	389.6	25.04	438
D	16:17	982.2	981.1	976.0	7.5	8.9	100	1890	17379	2620	70.3	1.10	1.13	31.5	33.5	.34	.38	3.7	1.19	.83	1.03	1.10	1.57	391.1	25.17	439
D	16:23	983.1	982.2	976.6	8.8	9.6	97	1890	17379	2599	70.3	1.10	1.12	31.5	33.2	.34	.39	2.5	1.16	.83	1.03	1.10	1.57	392.1	25.27	440
T	16:43	983.7	982.6	979.6	----	----	0	-210	17030	2599	70.1	1.10	1.12	31.5	34.7	.33	.39	2.5	----------		----------				----------	
T	18:26	983.7	982.6	980.8	----	----	0	-210	-1117	0	69.1	1.10	1.14	31.8	35.3	.33	.37	2.5	----------		----------				----------	
D	18:31	984.2	982.6	982.1	12.1	.0	96	1680	18000	2526	76.9	1.10	1.13	31.5	27.6	.32	.38	3.7	1.08	.83	1.03	1.10	1.57	392.6	25.32	440
D	18:37	985.1	984.1	982.7	8.8	7.4	94	1890	17286	2524	76.5	1.10	1.12	31.2	32.2	.32	.36	2.5	1.09	.83	1.03	1.10	1.57	394.1	25.41	439
D	18:44	986.1	985.1	983.6	11.5	7.9	94	1890	16697	2549	76.3	1.10	1.12	30.6	32.8	.33	.38	2.5	1.04	.83	1.03	1.10	1.57	395.1	25.52	440
D	18:50	987.1	986.1	983.6	9.2	7.7	94	1890	17038	2544	74.3	1.10	1.12	30.3	32.8	.32	.39	3.7	1.08	.83	1.03	1.10	1.57	396.1	25.62	440
D	18:57	988.1	986.6	983.6	8.9	7.6	96	1890	17131	2562	74.7	1.10	1.12	30.1	32.4	.32	.38	3.7	1.11	.83	1.03	1.10	1.57	397.1	25.74	441
D	19: 4	989.1	988.1	983.6	8.7	7.3	96	1680	17255	2542	73.1	1.10	1.16	30.2	33.7	.32	.41	3.7	1.11	.83	1.03	1.10	1.57	398.1	25.86	442
D	19:20	990.1	987.1	983.9	6.8	8.3	103	1680	17597	2575	66.8	1.10	1.14	30.4	31.4	.32	.40	5.0	1.14	.83	1.03	1.10	1.57	399.1	25.99	443
D	19:25	991.1	989.6	984.8	10.0	8.7	99	1890	17418	2580	62.6	1.10	1.13	30.5	31.9	.33	.38	2.5	1.08	.83	1.03	1.10	1.57	399.6	26.09	443
D	19:30	992.1	991.1	985.4	15.3	8.6	100	1890	17193	2600	61.8	1.10	1.12	30.6	32.1	.34	.38	3.7	.98	.83	1.03	1.10	1.57	401.1	26.16	443
D	19:36	993.1	992.1	986.3	8.7	9.1	100	1890	17007	2600	62.6	1.10	1.12	30.6	32.0	.34	.38	3.7	1.13	.83	1.03	1.10	1.57	402.1	26.25	443
D	19:44	994.1	993.1	987.6	7.5	8.5	101	1680	16479	2600	62.2	1.10	1.13	30.6	31.8	.34	.39	3.7	1.17	.83	1.03	1.10	1.57	403.1	26.39	444
D	19:51	995.1	994.2	988.5	10.4	8.2	101	1890	16697	2600	62.4	1.10	1.13	30.6	31.8	.34	.37	3.7	1.10	.83	1.03	1.10	1.57	404.1	26.50	444
D	19:57	996.1	995.1	989.4	8.7	8.8	101	1890	16759	2620	62.2	1.10	1.12	30.6	31.7	.34	.37	3.7	1.14	.83	1.03	1.10	1.57	405.0	26.61	445
D	20: 3	997.1	996.2	989.7	10.7	9.3	100	1890	16728	2580	61.8	1.10	1.12	30.5	31.7	.34	.37	3.7	1.10	.83	1.03	1.10	1.57	406.1	26.71	445
D	20: 9	998.2	997.2	990.6	19.5	9.2	101	1890	16293	2603	61.4	1.10	1.13	30.4	31.8	.34	.40	5.0	.93	.83	1.03	1.10	1.57	407.1	26.79	445
D	20:13	1000.4	997.7	991.8	22.4	.0	0	.000	434	2618	61.0	1.10	1.13	30.3	31.7	.34	.39	3.7	.92	.83	1.03	1.10	1.57	407.6	26.83	445
D	20:26	1001.1	1000.1	993.3	8.8	9.6	100	1680	17255	2584	60.0	1.10	1.13	30.2	31.9	.32	.39	5.0	1.13	.83	1.03	1.10	1.57	410.1	26.95	444
D	20:35	1002.1	1001.1	994.3	6.1	10.0	98	1890	16728	2602	60.8	1.10	1.13	30.2	32.4	.33	.39	5.0	1.26	.83	1.03	1.10	1.58	411.1	27.10	445
D	20:40	1003.1	1002.1	995.2	10.4	10.2	97	2100	16324	2602	60.6	1.10	1.13	30.2	32.3	.33	.39	5.0	1.10	.83	1.03	1.10	1.58	412.1	27.19	446
D	20:47	1004.1	1003.2	996.1	9.5	10.8	101	1890	16448	2582	60.8	1.10	1.12	30.3	32.1	.34	.40	5.0	1.13	.83	1.03	1.10	1.58	413.1	27.30	446
D	20:55	1005.1	1004.1	997.3	7.8	10.1	100	1890	15300	2620	60.8	1.10	1.13	30.4	32.1	.34	.39	5.0	1.21	.83	1.03	1.10	1.58	414.1	27.43	447
D	21: 4	1006.1	1005.1	1000.4	5.9	9.6	101	1680	15486	2620	60.6	1.10	1.12	30.5	31.7	.34	.39	5.0	1.26	.83	1.03	1.10	1.58	415.1	27.59	448
D	21:11	1007.1	1005.6	1001.0	6.1	9.7	98	1890	15652	2617	60.8	1.10	1.13	30.5	31.8	.34	.38	5.0	1.26	.83	1.03	1.10	1.58	415.6	27.70	448
D	21:18	1008.1	1007.1	1001.6	9.4	8.5	100	1890	15114	2620	60.6	1.10	1.12	30.4	31.9	.34	.37	5.0	1.14	.83	1.03	1.10	1.58	417.0	27.81	449
D	21:33	1009.5	1008.1	1003.1	9.9	11.9	86	3570	15672	2526	65.0	1.10	1.13	30.1	31.8	.32	.39	5.0	1.13	.83	1.03	1.10	1.58	418.1	27.91	449
D	21:39	1010.1	1009.1	1004.0	8.8	8.8	96	1890	16386	2544	64.8	1.10	1.12	29.9	31.8	.32	.38	2.5	1.14	.83	1.03	1.10	1.58	419.1	28.01	449
D	21:46	1011.1	1010.1	1004.9	7.6	8.8	96	1890	16169	2544	65.4	1.10	1.12	29.8	32.0	.32	.38	2.5	1.17	.83	1.03	1.10	1.58	420.1	28.13	450
D	21:55	1012.1	1011.1	1005.8	5.9	7.2	97	1680	16355	2544	65.8	1.10	1.12	29.6	32.8	.31	.38	3.7	1.21	.83	1.03	1.10	1.58	421.1	28.27	451
D	22: 3	1013.1	1012.1	1006.8	7.4	8.5	101	1890	16479	2564	63.2	1.10	1.12	29.4	32.0	.31	.39	2.5	1.17	.83	1.03	1.10	1.58	422.1	28.39	451
D	22: 9	1014.1	1013.1	1007.7	7.9	8.4	97	1680	16603	2562	64.6	1.10	1.12	29.4	32.1	.30	.39	2.5	1.15	.83	1.03	1.10	1.58	423.1	28.51	452
D	22:17	1015.1	1014.1	1008.9	9.8	9.4	96	1890	16821	2544	65.4	1.10	1.11	29.4	31.9	.30	.39	2.5	1.14	.83	1.03	1.10	1.58	424.1	28.63	453
D	22:23	1016.1	1015.1	1009.8	10.9	9.2	95	1890	17224	2544	66.2	1.10	1.11	29.5	31.9	.30	.38	2.5	1.10	.83	1.03	1.10	1.58	425.1	28.73	453
D	22:38	1017.1	1016.1	1010.4	6.0	8.9	96	1890	17007	2544	66.8	1.10	1.11	29.5	31.7	.30	.37	2.5	1.23	.83	1.03	1.10	1.58	426.1	28.85	454

GEOSERVICES — HAMMERHEAD #1 — DATE : 4/ 6/82

BIT#12 RUN#25 HTC J1 BIT DIAMETER : 12.25 inch NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 10 YP = 8 GEL = 3

	TIME	DEPTHS MEASURED	VERTCL	LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	Nxm	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	22:39	1018.1	1017.1	1011.6	5.5	8.9	97	1600	16045	2562	66.0	1.10	1.12	29.8	31.7	.31	.36	2.5	1.25	.83	1.03	1.10	1.58	427.1	29.00	455
D	22:53	1019.1	1018.1	1012.9	7.5	9.4	97	1890	16014	2488	67.6	1.10	1.13	30.1	31.4	.31	.35	2.5	1.18	.83	1.03	1.10	1.58	428.1	29.13	455
D	22:58	1020.1	1019.2	1013.0	10.4	8.9	98	1890	15952	2493	66.4	1.10	1.12	30.2	31.6	.31	.35	3.7	1.12	.83	1.03	1.10	1.58	429.1	29.21	455
D	23: 4	1021.1	1019.6	1014.4	8.1	9.3	97	1890	15921	2526	66.2	1.10	1.13	30.3	31.8	.31	.34	3.7	1.16	.83	1.03	1.10	1.58	429.6	29.31	456
D	23:15	1022.1	1020.6	1015.9	7.8	8.9	100	1680	15828	2506	66.4	1.10	1.12	30.4	31.9	.31	.36	3.7	1.18	.83	1.03	1.10	1.58	430.6	29.44	456
D	23:24	1023.1	1021.7	1016.8	9.1	10.4	96	1890	16052	2562	66.2	1.10	1.12	30.5	32.0	.31	.35	3.7	1.14	.83	1.03	1.10	1.58	431.6	29.58	457
D	23:33	1024.1	1023.1	1017.7	8.7	9.5	98	1680	17007	2562	65.8	1.10	1.12	30.5	32.0	.31	.36	3.7	1.16	.83	1.03	1.10	1.58	433.1	29.73	458
D	23:42	1025.1	1024.2	1018.6	6.2	9.5	95	1890	17069	2546	65.8	1.10	1.12	30.6	32.1	.31	.36	3.7	1.23	.83	1.03	1.10	1.58	434.1	29.88	459
D	23:50	1026.1	1025.1	1020.2	8.0	10.7	95	2100	17038	2582	65.6	1.10	1.12	30.7	32.3	.31	.37	3.7	1.20	.83	1.03	1.10	1.58	435.1	30.00	460
D	23:58	1027.2	1026.1	1021.4	6.9	10.2	97	1890	16821	2562	65.4	1.10	1.12	30.8	32.1	.31	.37	3.7	1.22	.83	1.03	1.10	1.58	436.1	30.14	460
D	0:12	1028.1	1026.7	1022.6	9.2	.2	102	1260	18000	2617	68.5	1.10	1.12	30.9	31.9	.31	.39	3.7	1.16	.83	1.03	1.10	1.58	436.6	30.22	461
D	0:20	1029.1	1028.1	1023.5	6.7	10.4	95	2100	18434	2670	65.6	1.10	1.12	30.9	32.3	.31	.37	3.7	1.23	.83	1.03	1.10	1.58	438.1	30.35	461
D	0:25	1030.1	1028.6	1024.1	11.0	11.2	97	2100	18372	2658	65.2	1.10	1.11	31.0	32.6	.31	.36	3.7	1.11	.83	1.03	1.10	1.58	438.6	30.44	461
D	0:31	1031.1	1030.1	1024.7	13.3	10.0	95	2100	18372	2671	65.2	1.10	1.12	31.0	32.4	.31	.37	3.7	1.00	.83	1.03	1.10	1.58	440.1	30.52	461
D	0:35	1032.1	1031.1	1025.3	12.0	10.1	96	1890	18155	2670	65.4	1.10	1.11	31.0	32.5	.31	.38	3.7	1.10	.83	1.03	1.10	1.58	441.1	30.60	461
D	0:41	1033.1	1032.1	1026.3	7.8	10.4	95	2100	18372	2670	65.2	1.10	1.11	31.1	32.7	.31	.36	2.5	1.20	.83	1.03	1.10	1.58	442.1	30.70	462
D	0:46	1034.1	1033.1	1026.9	12.2	10.5	93	2100	18497	2676	65.0	1.10	1.11	31.1	32.6	.31	.35	3.7	1.12	.83	1.03	1.10	1.58	443.1	30.78	462
D	0:52	1035.1	1034.2	1027.5	9.7	11.5	94	2100	18031	2670	65.2	1.10	1.11	31.1	32.8	.31	.36	3.7	1.18	.83	1.03	1.10	1.58	444.1	30.87	462
D	0:59	1036.1	1035.1	1028.1	8.6	10.7	96	1890	18466	2670	64.8	1.10	1.11	31.3	32.6	.31	.37	3.7	1.19	.83	1.03	1.10	1.58	445.1	30.99	462
D	1:11	1037.1	1035.6	1029.3	8.8	4.5	109	1890	18497	2617	68.3	1.10	1.12	31.3	33.2	.31	.36	3.7	1.21	.83	1.03	1.10	1.58	445.6	31.07	462
D	1:17	1038.1	1037.2	1030.5	11.7	9.8	104	2100	18600	2635	65.6	1.10	1.12	31.4	32.9	.31	.36	3.7	1.10	.83	1.03	1.10	1.58	447.1	31.17	463
D	1:21	1039.1	1038.1	1031.1	14.2	10.1	102	2100	18031	2638	65.2	1.10	1.11	31.4	32.9	.31	.37	2.5	1.07	.83	1.03	1.10	1.58	448.1	31.24	462
D	1:26	1040.1	1039.1	1032.1	10.4	10.0	103	2100	18000	2615	64.6	1.10	1.12	31.4	33.0	.31	.37	3.7	1.16	.83	1.03	1.10	1.58	449.1	31.32	462
D	1:31	1041.1	1040.1	1033.3	10.9	11.1	105	1890	17876	2635	64.6	1.10	1.11	31.5	33.3	.31	.38	3.7	1.17	.83	1.03	1.10	1.58	450.1	31.41	463
D	1:36	1042.1	1041.1	1034.2	13.6	11.0	103	2100	18062	2638	64.6	1.10	1.11	31.6	33.1	.31	.37	3.7	1.11	.83	1.03	1.10	1.59	451.1	31.49	463
D	1:43	1043.1	1042.1	1035.4	9.5	11.2	103	2100	17876	2676	64.6	1.10	1.12	31.7	33.1	.31	.36	3.7	1.19	.83	1.03	1.10	1.59	452.1	31.61	463
D	1:49	1044.1	1043.1	1036.0	11.0	10.7	104	2100	17907	2638	64.6	1.10	1.12	31.7	33.2	.31	.38	3.7	1.15	.83	1.03	1.10	1.59	453.1	31.70	463
D	1:56	1045.1	1044.1	1036.9	6.6	10.9	102	2100	18093	2635	64.2	1.10	1.11	31.8	33.2	.31	.37	3.7	1.29	.83	1.03	1.10	1.59	454.1	31.82	464
D	2: 0	1046.1	1045.2	1037.5	14.1	10.4	105	2100	18031	2638	64.4	1.10	1.11	31.8	33.2	.31	.36	3.7	1.08	.83	1.03	1.10	1.59	455.1	31.88	464
D	2:16	1047.1	1046.1	1040.3	7.0	9.4	102	1890	18155	2658	65.2	1.10	1.12	31.9	33.2	.31	.37	3.7	1.24	.83	1.03	1.10	1.59	456.1	32.01	464
D	2:24	1048.2	1047.1	1041.5	7.4	10.1	102	2100	18031	2641	64.4	1.10	1.12	31.9	33.7	.31	.36	2.5	1.22	.83	1.03	1.10	1.59	457.1	32.14	465
D	2:30	1049.1	1048.1	1042.7	9.6	9.2	100	1890	18031	2641	64.2	1.10	1.12	32.0	33.4	.31	.36	3.7	1.16	.83	1.03	1.10	1.59	458.1	32.24	465
D	2:34	1050.1	1049.1	1043.3	11.3	9.5	101	2100	18279	2641	64.0	1.10	1.11	32.1	33.9	.31	.36	3.7	1.10	.83	1.03	1.10	1.59	459.1	32.32	465
D	2:45	1051.1	1050.1	1045.2	5.8	9.9	101	1890	17938	2640	63.8	1.10	1.11	32.2	33.8	.31	.38	3.7	1.27	.83	1.03	1.10	1.59	460.1	32.51	466
D	2:53	1052.1	1051.2	1046.4	7.5	10.0	101	1890	17814	2641	64.0	1.10	1.11	32.3	33.7	.31	.38	3.7	1.20	.83	1.03	1.10	1.59	461.1	32.64	467
D	3: 1	1053.1	1052.1	1047.9	9.5	11.3	102	1890	17752	2641	69.5	1.10	1.11	32.4	33.7	.31	.36	3.7	1.17	.83	1.03	1.10	1.59	462.1	32.76	467
D	3: 7	1054.1	1053.1	1047.9	11.8	9.7	102	2100	17628	2656	71.7	1.10	1.11	32.3	33.8	.31	.36	3.7	1.11	.84	1.03	1.10	1.59	463.1	32.87	468
D	3:20	1055.2	1054.1	1049.4	11.5	.1	105	1260	16107	2681	73.9	1.10	1.12	32.2	34.2	.31	.38	2.5	1.03	.84	1.03	1.10	1.59	464.1	32.97	468
D	3:27	1056.1	1055.1	1050.3	6.3	9.6	100	1890	17969	2678	71.7	1.10	1.11	32.3	33.8	.31	.37	2.5	1.23	.84	1.03	1.10	1.59	465.1	33.08	469
D	3:42	1057.2	1056.1	1051.3	5.7	9.6	102	1890	11824	2118	70.5	1.10	1.11	32.4	33.8	.31	.37	2.5	1.25	.84	1.03	1.10	1.59	466.1	33.25	470
D	3:52	1058.1	1057.1	1052.2	5.3	9.6	101	1890	11979	2115	71.3	1.10	1.11	32.5	33.8	.31	.37	2.5	1.30	.84	1.03	1.10	1.59	467.1	33.42	471
D	4: 0	1059.1	1058.2	1053.1	9.2	10.9	95	1890	16852	2602	70.9	1.10	1.11	32.5	34.1	.31	.38	2.5	1.15	.84	1.03	1.10	1.59	468.1	33.56	472
D	4: 9	1060.1	1058.6	1054.6	6.1	10.1	93	2310	16976	2600	72.1	1.10	1.11	32.5	34.3	.31	.38	3.7	1.20	.84	1.03	1.10	1.59	468.6	33.71	472
D	4:17	1061.2	1060.1	1055.5	8.1	8.9	102	1890	17180	2618	72.1	1.10	1.11	32.6	34.0	.31	.39	2.5	1.20	.84	1.03	1.10	1.59	470.1	33.83	473
D	4:20	1062.1	1061.1	1055.8	22.9	9.1	101	2100	17100	2620	72.1	1.10	1.11	32.7	34.1	.31	.39	3.7	.93	.84	1.03	1.10	1.59	471.1	33.88	473
D	4:23	1063.2	1062.1	1056.1	18.4	9.4	102	2100	17317	2610	72.1	1.10	1.10	32.7	34.3	.31	.37	3.7	.98	.84	1.03	1.10	1.59	472.1	33.93	472
D	4:32	1064.1	1062.7	1056.4	28.6	-.3	108	1470	17721	2580	74.1	1.10	1.11	32.7	34.0	.31	.38	2.5	.91	.84	1.03	1.10	1.59	472.6	33.97	472
D	4:35	1065.2	1064.1	1056.7	18.6	8.2	103	2100	17721	2638	71.7	1.10	1.11	32.7	33.7	.31	.38	3.7	.98	.84	1.03	1.10	1.59	474.1	34.03	471
D	4:40	1066.2	1065.1	1057.4	11.5	10.2	103	2100	17752	2638	72.1	1.10	1.11	32.8	34.2	.31	.37	2.5	1.10	.84	1.03	1.10	1.59	475.1	34.10	471

GEOSERVICES — HAMMERHEAD #1 — DATE : 5/ 6/02

ON-LINE TDC

BIT#12 RUN#25 HTC J1 BIT DIAMETER : 12.25 inch NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 9 YP = 7 GEL = 4

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	DENSITY IN	DENSITY OUT	MUD PARAMETERS TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	4:44	1067.1	1066.1	1058.0	12.4	8.9	104	1890	17566	2635	72.9	1.10	1.11	32.0	34.2	.31	.38	2.5	1.08	.84	1.03	1.10	1.59	476.1	34.10	471
D	4:48	1068.1	1067.1	1059.3	15.5	10.8	102	2100	17752	2617	72.5	1.10	1.11	32.0	34.1	.31	.38	2.5	1.04	.84	1.03	1.10	1.59	477.1	34.24	471
D	4:52	1069.1	1067.7	1058.9	18.2	9.8	103	2100	17907	2638	72.7	1.10	1.11	32.9	33.9	.31	.37	2.5	.99	.84	1.03	1.10	1.59	477.6	34.30	471
D	4:55	1070.2	1069.2	1059.2	19.1	8.8	103	2100	17628	2620	72.9	1.10	1.11	32.9	34.0	.31	.37	2.5	.97	.84	1.03	1.10	1.59	479.1	34.35	470
D	4:58	1071.1	1069.6	1059.5	17.9	9.2	102	2100	17752	2638	72.9	1.10	1.11	32.9	34.2	.31	.37	2.5	.98	.84	1.03	1.10	1.59	479.6	34.40	470
D	5: 2	1072.1	1071.1	1060.1	17.9	9.5	102	2100	17566	2638	72.9	1.10	1.11	32.9	34.3	.31	.38	2.5	.99	.84	1.03	1.10	1.59	481.1	34.47	470
D	5: 5	1073.2	1072.1	1060.4	19.7	10.2	102	2100	17703	2648	70.3	1.10	1.11	32.9	34.3	.31	.37	2.5	.97	.84	1.03	1.10	1.59	482.1	34.51	469
D	5:17	1074.1	1073.2	1062.5	18.6	9.7	98	1890	18931	2711	67.2	1.10	1.11	32.9	34.5	.31	.38	3.7	.98	.84	1.03	1.10	1.59	483.1	34.58	469
D	5:20	1075.1	1073.7	1063.8	19.3	9.8	98	1680	19148	2716	66.0	1.10	1.11	32.9	34.6	.31	.38	2.5	.97	.84	1.03	1.10	1.59	483.6	34.64	469
D	5:24	1076.1	1075.2	1064.7	14.3	8.7	98	1680	19498	2716	65.6	1.10	1.11	33.0	34.3	.31	.40	2.5	1.03	.84	1.03	1.10	1.59	485.1	34.70	469
D	5:31	1077.2	1075.6	1065.9	9.7	9.6	94	1890	13686	2182	67.0	1.10	1.11	33.1	34.0	.31	.38	2.5	1.06	.84	1.03	1.10	1.59	485.6	34.78	469
D	5:36	1078.1	1077.1	1066.5	13.4	9.9	93	2100	13593	2190	66.8	1.10	1.12	33.1	34.8	.31	.37	2.5	1.03	.84	1.03	1.10	1.59	487.1	34.86	469
D	5:39	1079.2	1078.1	1067.4	20.9	9.4	93	2100	13430	2178	66.6	1.10	1.11	33.1	34.7	.30	.38	3.7	.93	.84	1.03	1.10	1.59	488.1	34.92	468
D	5:42	1080.2	1079.1	1068.3	17.6	8.8	95	1890	13314	2170	66.6	1.10	1.11	33.0	35.0	.31	.38	2.5	.97	.84	1.03	1.10	1.59	489.1	34.97	468
D	5:45	1081.1	1080.2	1068.6	23.3	9.2	93	1890	13376	2190	66.8	1.10	1.11	33.1	35.0	.31	.38	2.5	.90	.84	1.03	1.10	1.59	490.1	35.01	468

ON-LINE TDC
GEOSERVICES

BIT REPORT

\# 5/ 6/82 HAMMERHEAD #1

*BIT HEADING :BIT#12 RUN#25
*BIT TYPE :H/TOOT
*BIT IDENTITY :HTC J1

*BIT SIZE : 12.25 INCH
*BIT COST : 7500. $ RIG COST/HR: 5833.

*NOZZLES : 13 13 13 /32NDS @ 95 % EFFICIENCY

*DEPTH IN : 591.20 METERS 3/ 6/82
*DEPTH OUT : 1081.89 METERS 5/ 6/82
*METRAGE : 490.62 METERS
*TOTAL REVOLUTIONS : 204

*DRILLING TIME: 35: 4 HR AVERAGE ROP: 13.99 M/HR
*TIME IN HOLE : 45:35 HR AVERAGE ROP: 10.76 M/HR
*TRIP TIME : 3: 0 HR

*DRILLING COST STANDARD : 593.8 $/MET
*DRILLING COST ON BOTTOM : 467.9 $/MET
*DRILLING COST MINIMUM : 402.1 $/MET

AVERAGE OVER THE RUN		AVERAGE HYDRAULICS	
*WEIGHT ON BIT	: 8.20 TONS	NOZZLES SPEED	: 171.11 M/S
*ROTATION	: 98.19 RPM	PRESSURE DROP	: 17821 KPA
*FLOW RATE	:2573.97 L/MN	HYDRAULIC POWER	:1025.39 H.P
*STAND PIPE PRESSURE:	16756 KPA		

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

5/ 6/82 TIME 5:55 HAMMERHEAD #1

DEPTH OF EXECUTION 1081.89 METERS
FLOW RATE 2500 L/MN POWER LAW

MUD DATA	WEIGHT	1.10	SG
	PV	9	CPS
	YP	7.00	LB/FT2
	GEL	4.00	LB/100 FT2
	N	.8074	
	K	.0781	LB/100 FT2
HOLES VOLUMES	WITH PIPES	127.79	M3
	WITHOUT PIPES	133.51	M3
	ANNULAR	118.23	M3
	INSIDE PIPES	9.56	M3

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						476	27				
DR.STRING	.00	993.60	4.28	5.00		1865	100				
DR.STRING	993.60	1082.40	2.81	7.75		1244	72				
BIT						17905	1033	H/S		171.5	
ANNULUS	1081.89	993.09		7.75	12.25	9	1	TU	1236.8	56.6	52.7
ANNULUS	993.09	554.00		5.00	12.25	14	1	TU	1244.5	40.7	37.1
ANNULUS	554.00	143.00		5.00	10.73	1	0	TU	2103.9	15.6	12.3
ANNULUS	143.00	.00		5.00	16.75	1	0	TU	1834.0	19.9	16.5
TOTAL						21514	1241				

ANNULAR PRESSURE LOSSES 24 KPA

EQUIV.CIRCULATING DENSITY 1.10 SG
MAX DEPTH 3232.09

MUD LAG TIMES	S -> B	3.71 MN
	B -> S	45.83 MN
CUTTINGS DATA	SIZE	.20 CM
	DENSITY	2.40 SG
	LAG TIME	55.50 MN
	MAX SLIP VELOCITY	3.85 M/MN
BIT DATA	SIZE	12.25 INCH
	NOZZLES	13 13 13 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	17905 KPA
	H.H.P RATIO	83.22 %
	BIT H.H.P	8.761
	BIT VELOCITY	171.51 M/S

*-GEOSERVICES HAMMERHEAD #1 DATE : 5/ 6/82

* ON-LINE TDC

BIT#12 RUN#25 HTC J1 BIT DIAMETER : 12.25 inch NOZZ 13/13/13 MUD RHEOLOGICAL PARAMETERS : PV = 9 YP = 7 GEL = 4

		DEPTHS			DRILLING PARAMETERS						MUD PARAMETERS						GAS	OVERPRESSURE SURVEY					ACCUMULATED ON BIT		
	TIME	MEASURED	VERTCL	LAGGED	ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT		DCS	NORM	PF	ECD	FRAC	METER	TIME	COST
	Hr:Mn	met	met	met	m/hr	ton	rpm	kNm	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	6: 1	1083.0	1080.7	1070.8	15.4	.0	0	.000	3600	2019	69.3	1.10	1.12	33.1	34.4	.31	.36	2.5	.98	.84	1.03	1.10	1.59	490.6	35.07	468
T	6:21	1083.0	1080.7	1075.9	----	----	0	.000	1955	332	71.7	1.10	1.12	32.9	35.7	.31	.36	2.5	----	----	----	----	----	----	----	----
D	6:28	1083.1	1082.1	1077.2	48.9	7.5	94	2100	17379	2637	69.7	1.10	1.11	33.2	35.4	.31	.38	2.5	.60	.84	1.03	1.10	1.59	492.1	35.09	467
D	6:32	1084.1	1083.1	1078.4	15.3	8.7	93	1890	16603	2655	68.5	1.10	1.11	33.2	35.1	.31	.38	2.5	.98	.84	1.03	1.10	1.60	493.1	35.16	467
D	6:37	1085.1	1084.1	1080.2	13.4	8.1	96	1890	16790	2673	67.6	1.10	1.11	33.3	35.2	.31	.38	2.5	1.01	.84	1.03	1.10	1.60	494.1	35.24	467
D	6:41	1086.1	1085.1	1082.7	14.7	8.3	96	1890	17597	2711	66.6	1.10	1.11	33.4	35.2	.31	.37	2.5	.99	.84	1.03	1.10	1.60	495.1	35.31	467
D	6:46	1087.1	1086.1	1082.7	12.2	6.5	97	1890	16510	2713	67.4	1.10	1.11	33.4	35.3	.31	.37	2.5	1.03	.84	1.03	1.10	1.60	496.1	35.38	466
D	6:50	1088.1	1087.1	1082.7	13.5	8.1	96	1890	16803	2675	67.2	1.10	1.11	33.5	34.8	.31	.38	2.5	1.01	.84	1.03	1.10	1.60	497.1	35.46	466
D	6:54	1089.1	1088.2	1083.8	14.3	8.9	97	1880	16510	2650	67.2	1.10	1.10	33.5	34.7	.31	.37	2.5	.98	.84	1.03	1.10	1.60	498.1	35.52	466
D	6:58	1090.1	1088.7	1083.8	17.2	8.2	96	1880	16803	2686	67.4	1.10	1.10	33.5	34.5	.31	.38	3.7	.95	.84	1.03	1.10	1.60	498.6	35.59	466
D	7: 3	1091.1	1090.2	1083.8	12.7	8.1	96	2310	16720	2693	67.6	1.10	1.11	33.5	34.3	.31	.37	2.5	1.04	.84	1.03	1.10	1.60	500.1	35.67	466
D	7: 7	1092.1	1091.1	1083.8	11.1	8.3	97	1680	16893	2675	67.4	1.10	1.11	33.6	34.3	.31	.37	2.5	1.05	.84	1.03	1.10	1.60	501.1	35.74	466
D	7:21	1093.1	1092.1	1083.8	13.3	8.5	98	1890	12445	2156	69.5	1.10	1.11	33.5	33.7	.31	.37	2.5	1.02	.84	1.03	1.10	1.60	502.1	35.83	466
D	7:26	1094.1	1093.1	1083.6	10.0	7.3	102	1890	17441	2680	69.1	1.10	1.11	33.4	34.2	.31	.37	2.5	.99	.84	1.03	1.10	1.60	503.1	35.91	466
D	7:30	1095.2	1094.1	1084.5	15.8	8.9	100	1890	17162	2618	67.6	1.10	1.11	33.4	34.3	.31	.37	2.5	.98	.84	1.03	1.10	1.60	504.1	35.97	466
D	7:34	1096.1	1095.1	1085.4	19.9	7.8	101	1890	16355	2618	67.9	1.10	1.12	33.2	34.5	.31	.37	3.7	.93	.84	1.03	1.10	1.60	505.1	36.03	466
D	7:37	1097.1	1096.2	1086.0	15.9	9.0	102	2100	16440	2648	67.6	1.10	1.11	33.3	34.4	.31	.36	3.7	.98	.84	1.03	1.10	1.60	506.1	36.09	465
D	7:41	1098.1	1096.7	1087.2	13.8	8.1	102	1890	16076	2650	67.7	1.10	1.11	33.2	34.7	.32	.36	3.7	1.02	.84	1.03	1.10	1.60	506.6	36.16	465
D	7:45	1099.1	1097.7	1087.8	15.6	8.7	100	1890	15921	2620	67.4	1.10	1.11	33.1	34.7	.32	.36	3.7	1.00	.84	1.03	1.10	1.60	507.6	36.23	465
D	7:49	1100.1	1099.1	1088.7	18.7	7.9	102	1680	16572	2638	67.0	1.10	1.12	33.1	34.7	.32	.36	3.7	.95	.84	1.03	1.10	1.60	509.1	36.29	465
D	8: 0	1101.1	1100.2	1090.9	9.3	6.9	102	1890	16541	2680	68.1	1.10	1.12	33.2	34.5	.31	.36	2.5	1.10	.84	1.03	1.10	1.60	510.1	36.37	465
D	8: 4	1102.1	1101.2	1091.5	14.7	5.7	106	1680	16541	2680	64.8	1.10	1.12	33.2	34.6	.31	.36	2.5	.97	.84	1.03	1.10	1.60	511.1	36.43	465
D	8: 8	1103.1	1102.1	1092.1	16.8	8.2	105	2100	17131	2580	64.8	1.10	1.12	33.2	34.7	.30	.36	3.7	.99	.84	1.03	1.10	1.60	512.1	36.49	464
D	8:11	1104.1	1103.2	1092.7	20.6	8.6	103	1890	17503	2600	65.8	1.10	1.11	33.2	34.7	.30	.36	3.7	.92	.84	1.03	1.10	1.60	513.1	36.54	464
D	8:15	1105.2	1104.1	1093.3	17.2	8.9	101	1890	17076	2572	65.2	1.10	1.12	33.2	35.0	.30	.36	2.5	.96	.84	1.03	1.10	1.60	514.1	36.60	464
D	8:18	1106.1	1105.2	1094.2	18.4	8.7	101	2100	18093	2562	65.0	1.10	1.11	33.2	34.8	.29	.36	3.7	.94	.84	1.03	1.10	1.60	515.1	36.66	464
D	8:22	1107.1	1106.1	1095.1	14.8	8.5	103	2100	18310	2524	64.6	1.10	1.12	33.3	34.9	.29	.35	2.5	.97	.84	1.03	1.10	1.60	516.1	36.72	463
D	8:25	1108.1	1106.6	1096.4	18.5	6.3	102	1890	18683	2544	64.2	1.10	1.11	33.2	35.1	.29	.37	2.5	.94	.84	1.03	1.10	1.60	516.6	36.78	463
D	8:37	1109.1	1107.7	1098.5	13.0	6.8	99	1890	19210	2580	66.2	1.10	1.12	33.3	34.8	.29	.36	2.5	.98	.84	1.03	1.10	1.60	517.6	36.88	463
D	8:42	1110.1	1109.1	1099.7	14.6	8.2	99	1890	19272	2560	64.2	1.10	1.11	33.4	35.0	.29	.35	2.5	.95	.84	1.03	1.10	1.60	519.1	36.95	463
D	8:46	1111.1	1110.1	1100.3	13.2	7.8	98	1890	19210	2544	64.8	1.10	1.11	33.4	35.0	.29	.35	2.5	1.00	.84	1.03	1.10	1.60	520.1	37.02	463
D	8:48	1113.5	1110.6	1100.3	15.2	7.6	101	1680	19210	2580	64.2	1.10	1.11	33.3	35.0	.29	.35	2.5	.97	.84	1.03	1.10	1.60	520.6	37.05	463
D	8:51	1114.2	1113.1	1100.6	14.4	9.2	100	1890	19179	2562	64.2	1.10	1.11	33.4	35.2	.28	.36	2.5	1.00	.84	1.03	1.10	1.60	523.1	37.11	461
D	8:56	1115.2	1114.1	1101.9	11.7	9.2	99	1890	19241	2562	64.4	1.10	1.12	33.4	35.4	.29	.35	3.7	1.07	.84	1.03	1.10	1.60	524.1	37.19	462
D	9: 3	1116.1	1115.1	1104.6	8.7	9.1	101	1890	19241	2574	64.4	1.10	1.11	33.5	35.3	.29	.35	3.7	1.15	.84	1.03	1.10	1.60	525.1	37.31	462
D	9:11	1117.2	1116.1	1106.4	9.6	10.2	100	1890	19241	2579	64.6	1.10	1.12	33.5	35.8	.28	.35	2.5	1.15	.84	1.03	1.10	1.60	526.1	37.43	462
D	9:16	1118.1	1117.2	1107.6	10.3	10.2	101	1890	19210	2562	65.0	1.10	1.11	33.7	35.7	.28	.34	3.7	1.13	.84	1.03	1.10	1.60	527.1	37.52	463
D	9:27	1119.2	1117.6	1108.6	10.5	-.1	119	1470	15766	2347	67.7	1.10	1.12	33.8	35.6	.29	.35	2.5	1.11	.84	1.03	1.10	1.60	527.6	37.60	463
D	9:33	1120.1	1118.6	1109.8	8.5	7.7	102	1680	16728	2428	67.4	1.10	1.12	33.8	35.6	.29	.35	2.5	1.13	.84	1.03	1.10	1.60	528.6	37.70	463
D	9:38	1121.1	1120.1	1111.0	10.7	7.5	104	1680	16324	2420	67.6	1.10	1.12	33.9	35.8	.29	.35	2.5	1.07	.84	1.03	1.10	1.60	530.1	37.78	463
D	9:44	1122.1	1121.1	1114.0	10.4	8.7	101	1890	16076	2415	67.4	1.10	1.12	34.0	35.9	.29	.35	3.7	1.06	.84	1.03	1.10	1.60	531.1	37.87	463
D	9:50	1123.1	1122.1	1115.3	8.4	7.4	104	1680	15952	2433	66.8	1.10	1.12	34.1	35.9	.29	.34	2.5	1.11	.84	1.03	1.10	1.60	532.1	37.98	463
D	9:55	1124.1	1123.1	1115.6	12.0	9.3	101	2100	15952	2433	66.4	1.10	1.12	34.1	35.6	.29	.35	3.7	1.03	.84	1.03	1.10	1.60	533.1	38.05	463
D	9:58	1125.1	1124.2	1116.2	15.6	7.0	103	1890	16231	2415	66.0	1.10	1.11	34.1	35.7	.29	.35	2.5	.96	.84	1.03	1.10	1.60	534.1	38.11	463
D	10: 2	1126.1	1125.2	1116.5	15.3	9.2	103	1890	16355	2433	65.8	1.10	1.11	34.2	36.0	.29	.35	3.7	1.00	.84	1.03	1.10	1.61	535.1	38.17	463
D	10: 5	1127.1	1126.2	1117.1	22.7	9.8	101	2100	16572	2397	65.6	1.10	1.12	34.2	35.9	.29	.35	3.7	.91	.84	1.03	1.10	1.61	536.1	38.22	463
D	10: 8	1128.2	1127.1	1117.7	16.8	8.7	102	1890	16666	2433	65.6	1.10	1.12	34.2	35.9	.29	.35	2.5	.99	.84	1.03	1.10	1.61	537.1	38.27	462
D	10:17	1129.1	1127.7	1110.6	21.1	9.8	102	2310	16572	2453	68.7	1.10	1.11	34.3	35.7	.29	.35	3.7	.95	.84	1.03	1.10	1.61	537.6	38.31	462
D	10:21	1130.1	1129.2	1118.9	12.2	6.9	112	1890	16107	2415	67.7	1.10	1.12	34.2	35.8	.29	.36	2.5	1.03	.84	1.03	1.10	1.61	539.1	38.39	462

GEOSERVICES — HAMMERHEAD #1 — DATE : 5/ 6/82

ON-LINE TDC

BIT#12 RUN#25 HTC J1 — BIT DIAMETER : 12.25 inch — NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 9 YP = 7 GEL = 4

	TIME	DEPTHS MEASURED	VERTCL	LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	OUT	TEMPERATURE IN	OUT	RESISTIVITY IN	OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	XPA	l/mn	m3	sg		degC		ohm		unit			sg	sg	sg	met	DHr	$/m
D	10:25	1131.1	1130.2	1119.2	19.5	9.0	111	2100	16945	2453	67.9	1.10	1.12	34.3	35.5	.29	.35	1.2	.95	.84	1.03	1.10	1.61	540.1	38.45	462
D	10:29	1132.2	1131.2	1119.8	16.2	8.3	110	2100	16603	2453	67.6	1.10	1.12	34.3	35.8	.29	.35	2.5	1.00	.84	1.03	1.10	1.61	541.2	38.51	461
D	10:32	1133.2	1132.1	1120.8	17.0	9.3	108	2100	16510	2488	67.9	1.10	1.12	34.4	35.6	.30	.36	2.5	1.00	.84	1.03	1.10	1.61	542.1	38.56	461
D	10:35	1134.1	1133.1	1121.4	17.2	9.4	109	1890	16666	2471	67.9	1.10	1.11	34.4	35.7	.30	.36	2.5	1.00	.84	1.03	1.10	1.61	543.1	38.61	461
D	10:38	1135.1	1133.6	1122.0	16.1	10.5	110	2100	16720	2453	68.1	1.10	1.12	34.4	35.7	.30	.35	2.5	1.02	.84	1.03	1.10	1.61	543.6	38.67	461
D	10:42	1136.1	1135.2	1122.6	15.8	9.4	110	1890	16262	2471	68.1	1.10	1.12	34.4	35.7	.30	.36	3.7	1.04	.84	1.03	1.10	1.61	545.1	38.72	460
D	10:45	1137.1	1136.1	1123.2	16.2	9.5	110	1890	16231	2488	68.1	1.10	1.12	34.4	35.8	.30	.36	3.7	1.04	.84	1.03	1.10	1.61	546.1	38.78	460
D	10:58	1138.1	1137.2	1125.3	22.2	1.1	111	1680	17255	2506	70.5	1.10	1.11	34.4	35.9	.30	.36	2.5	.89	.84	1.03	1.10	1.61	547.1	38.83	460
D	11: 1	1139.1	1137.6	1126.2	12.8	9.4	108	2100	17206	2561	72.1	1.10	1.11	34.4	36.3	.30	.37	2.5	1.06	.84	1.03	1.10	1.61	547.6	38.89	460
D	11: 5	1140.1	1139.2	1127.5	20.0	8.9	110	2100	17162	2541	74.9	1.10	1.11	34.3	36.0	.30	.35	2.5	.96	.84	1.03	1.10	1.61	549.1	38.95	459
D	11: 8	1141.1	1139.7	1128.4	18.4	9.1	108	1890	17193	2541	75.3	1.10	1.11	34.4	36.2	.30	.35	2.5	.98	.84	1.03	1.10	1.61	549.6	39.00	459
D	11:12	1142.1	1141.1	1129.0	18.0	8.4	109	2100	16479	2559	74.9	1.10	1.11	34.4	36.1	.30	.35	2.5	.98	.84	1.03	1.10	1.61	551.1	39.07	459
D	11:15	1143.1	1142.2	1129.9	16.6	9.2	111	1890	16572	2544	74.9	1.10	1.11	34.4	36.1	.30	.35	2.5	1.02	.84	1.03	1.10	1.61	552.1	39.12	459
D	11:19	1144.1	1142.7	1130.8	16.2	8.9	108	2100	16448	2554	75.1	1.10	1.11	34.5	36.2	.30	.36	2.5	1.01	.84	1.03	1.10	1.61	552.6	39.19	459
D	11:23	1145.1	1144.1	1132.3	18.7	9.5	106	1890	16448	2562	75.7	1.13	1.12	34.5	36.4	.30	.36	2.5	1.10	.84	1.03	1.13	1.61	554.1	39.25	458
D	11:27	1146.1	1145.1	1133.6	16.2	9.2	108	2100	16541	2546	75.9	1.13	1.11	34.6	36.3	.30	.36	2.5	1.00	.84	1.03	1.13	1.61	555.1	39.32	458
D	11:38	1147.1	1146.2	1135.7	15.8	9.4	101	2100	16666	2524	76.9	1.13	1.11	34.8	36.5	.30	.35	2.5	.95	.84	1.03	1.13	1.61	556.1	39.39	458
D	11:43	1148.1	1147.1	1137.2	11.9	8.2	105	1680	16510	2544	75.3	1.13	1.11	34.8	36.4	.30	.36	2.5	1.00	.84	1.03	1.13	1.61	557.1	39.48	458
D	11:49	1149.2	1148.1	1137.8	12.0	8.2	103	1890	16417	2524	75.3	1.13	1.11	34.8	36.3	.30	.36	2.5	1.08	.84	1.03	1.13	1.61	558.1	39.56	458
D	11:55	1150.2	1149.2	1139.8	9.4	8.4	105	1890	15859	2526	75.3	1.13	1.11	34.9	36.4	.30	.36	2.5	1.06	.84	1.03	1.13	1.61	559.2	39.67	459
D	12: 1	1151.1	1149.6	1140.6	10.7	8.9	103	1890	16076	2544	75.3	1.13	1.11	34.9	36.5	.30	.37	2.5	1.04	.84	1.03	1.13	1.61	559.6	39.76	459
D	12: 7	1152.1	1150.6	1142.7	10.3	7.1	106	1890	12383	2544	73.9	1.13	1.11	34.9	36.6	.30	.36	2.5	1.07	.84	1.03	1.13	1.61	560.6	39.87	459
D	12:16	1153.1	1152.2	1144.2	9.4	7.6	98	2100	10024	1873	80.5	1.13	1.12	34.8	35.3	.30	.36	2.5	1.02	.84	1.03	1.13	1.61	562.1	39.97	459
D	12:23	1154.1	1153.1	1145.1	10.1	7.1	100	1890	9087	1891	76.1	1.13	1.11	34.9	35.7	.30	.38	2.5	1.04	.84	1.03	1.13	1.61	563.1	40.05	459
D	12:29	1155.1	1153.7	1146.4	12.9	8.2	102	1890	9559	1891	73.7	1.13	1.11	35.0	35.7	.30	.37	2.5	.99	.84	1.03	1.13	1.61	563.6	40.16	459
D	12:42	1156.3	1154.7	1147.3	11.2	-.7	77	1470	10303	2172	75.5	1.13	1.12	34.8	36.2	.30	.36	2.5	.92	.84	1.03	1.13	1.61	565.3	40.25	460
D	12:44	1157.1	1156.1	1147.6	5.6	8.6	97	2100	14003	2450	74.1	1.13	1.11	34.7	36.3	.30	.37	2.5	1.22	.84	1.03	1.13	1.61	566.1	40.28	459
D	12:51	1158.1	1156.6	1148.8	9.6	8.8	103	1890	15393	2471	73.5	1.13	1.11	34.8	36.3	.30	.37	2.5	1.07	.84	1.03	1.13	1.61	566.6	40.39	459
D	12:56	1159.2	1158.1	1149.7	13.4	8.2	106	1890	15859	2450	73.7	1.13	1.11	34.7	36.8	.30	.37	2.5	.99	.84	1.03	1.13	1.61	568.1	40.49	460
D	13: 1	1160.1	1159.1	1150.6	11.6	7.9	109	1890	15703	2468	73.9	1.13	1.11	34.7	36.4	.30	.37	2.5	1.02	.84	1.03	1.13	1.61	569.1	40.57	460
D	13: 7	1161.1	1160.2	1151.5	11.8	8.8	102	1890	15393	2471	74.1	1.13	1.12	34.8	36.2	.30	.37	3.7	1.02	.84	1.03	1.13	1.61	570.1	40.66	460
D	13:13	1162.1	1160.7	1152.1	10.3	8.5	101	1890	15269	2465	74.3	1.13	1.12	34.9	35.8	.30	.37	3.7	1.04	.84	1.03	1.13	1.61	570.6	40.76	460
D	13:19	1163.1	1162.1	1153.4	10.3	8.3	100	1890	16572	2541	74.5	1.13	1.12	34.9	35.9	.30	.36	2.5	1.04	.84	1.03	1.13	1.61	572.1	40.86	460
D	13:26	1164.1	1163.1	1154.6	9.4	7.6	98	1680	16440	2526	73.9	1.13	1.12	35.0	36.3	.31	.36	2.5	1.07	.84	1.03	1.13	1.61	573.1	40.97	461
D	13:33	1165.1	1164.1	1155.8	9.1	9.3	99	1890	16231	2541	73.7	1.13	1.11	34.9	36.4	.31	.37	3.7	1.07	.84	1.03	1.13	1.61	574.1	41.09	461
D	13:46	1166.2	1165.1	1157.9	10.3	7.4	102	1680	16976	2525	73.9	1.13	1.10	34.9	36.8	.30	.37	3.7	1.02	.84	1.03	1.13	1.61	575.1	41.19	461
D	13:51	1167.2	1166.1	1159.2	11.9	8.8	101	1890	16759	2563	73.9	1.13	1.11	34.9	36.8	.30	.38	2.5	1.02	.84	1.03	1.13	1.61	576.1	41.28	461
D	13:56	1168.2	1167.2	1159.8	12.9	8.8	101	1890	16852	2574	74.1	1.13	1.10	35.0	36.9	.30	.37	3.7	1.00	.84	1.03	1.13	1.62	577.2	41.35	461
D	14: 1	1169.1	1168.1	1160.7	12.5	8.6	102	1890	16821	2563	74.1	1.13	1.11	35.0	37.0	.30	.37	3.7	1.02	.84	1.03	1.13	1.62	578.1	41.44	461
D	14: 7	1170.1	1169.1	1161.6	10.0	8.8	102	1890	16803	2551	74.1	1.13	1.10	35.1	37.2	.30	.37	2.5	1.05	.84	1.03	1.13	1.62	579.1	41.54	462
D	14:12	1171.1	1170.1	1162.5	15.5	8.3	101	1890	16876	2561	74.1	1.13	1.11	35.2	37.8	.30	.38	2.5	.96	.84	1.03	1.13	1.62	580.1	41.61	462
D	14:17	1172.1	1171.2	1163.4	10.8	8.5	101	1890	16914	2563	73.9	1.13	1.11	35.3	37.0	.30	.37	2.5	1.04	.84	1.03	1.13	1.62	581.1	41.70	462
D	14:22	1173.1	1172.1	1164.8	10.6	7.7	102	1890	16770	2546	73.9	1.13	1.11	35.4	37.1	.31	.38	3.7	1.04	.84	1.03	1.13	1.62	582.1	41.80	462
D	14:29	1174.1	1173.1	1165.3	9.9	9.0	100	1890	16759	2553	73.9	1.13	1.11	35.4	37.8	.30	.37	3.7	1.05	.84	1.03	1.13	1.62	583.1	41.90	462
D	14:40	1175.1	1173.7	1166.2	9.2	8.8	98	1890	16759	2524	73.7	1.13	1.11	35.4	37.5	.30	.37	2.5	1.07	.84	1.03	1.13	1.62	583.6	41.99	462
D	14:45	1176.1	1175.2	1166.8	19.3	7.7	98	1890	16572	2539	73.9	1.13	1.11	35.5	37.9	.31	.37	3.7	.89	.84	1.03	1.13	1.62	585.1	42.06	462
D	14:49	1177.1	1176.2	1168.8	13.7	9.2	97	2100	16634	2524	74.1	1.13	1.11	35.5	38.1	.31	.38	3.7	.97	.84	1.03	1.13	1.62	586.1	42.13	462
D	14:53	1178.1	1177.2	1168.6	12.0	6.7	100	1890	16572	2541	73.9	1.13	1.11	35.7	38.1	.31	.37	3.7	.99	.84	1.03	1.13	1.62	587.1	42.21	462
D	14:58	1179.1	1177.7	1169.5	12.8	8.1	98	2100	16200	2541	73.7	1.13	1.11	35.7	37.9	.31	.38	3.7	.99	.84	1.03	1.13	1.62	587.6	42.28	462

GEOSERVICES — HAMMERHEAD #1 — DATE : 5/ 6/82

ON-LINE TDC

BIT#12 RUN#25 HTC J1 — BIT DIAMETER : 12.25 inch — NOZZ 13/13/13 — MUD RHEOLOGICAL PARAMETERS : PV = 10 YP = 8 GEL = 4

		TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
		Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D		15: 3	1180.2	1179.1	1170.4	9.9	6.5	101	1890	16759	2544	73.5	1.13	1.11	35.8	37.6	.31	.38	2.5	1.03	.84	1.03	1.13	1.62	589.1	42.37	462
D		15: 8	1181.2	1179.7	1171.3	12.8	7.6	98	1890	16666	2526	70.1	1.13	1.11	35.9	38.0	.31	.38	3.7	.95	.84	1.03	1.13	1.62	589.6	42.44	462
D		15:13	1182.1	1180.7	1172.3	10.2	8.1	98	1890	15548	2544	78.1	1.13	1.11	36.0	38.1	.31	.38	3.7	1.03	.84	1.03	1.13	1.62	590.6	42.52	462
D		15:18	1183.2	1182.1	1173.2	9.5	8.6	90	848.	14387	2544	69.9	1.13	1.11	36.0	37.9	.31	.37	3.7	1.05	.84	1.03	1.13	1.62	592.1	42.62	462
D		15:32	1184.1	1183.1	1174.4	13.1	7.5	99	1890	17007	2630	70.3	1.13	1.11	36.1	38.6	.32	.37	2.5	.99	.84	1.03	1.13	1.62	593.1	42.68	462
D		15:37	1185.1	1183.7	1175.3	11.5	9.4	100	2100	15903	2637	69.5	1.13	1.11	36.2	38.2	.32	.38	3.7	1.01	.84	1.03	1.13	1.62	593.6	42.76	462
D		15:42	1186.1	1185.2	1176.2	13.6	8.9	98	2100	16572	2635	69.3	1.13	1.11	36.2	38.2	.31	.37	3.7	.97	.84	1.03	1.13	1.62	595.1	42.84	462
D		15:45	1187.2	1185.6	1177.1	21.0	7.2	98	1890	16417	2655	70.1	1.13	1.11	36.2	38.1	.32	.38	3.7	.88	.84	1.03	1.13	1.62	596.2	42.89	462
D		15:48	1188.1	1187.1	1177.7	21.1	8.4	98	2100	16231	2635	69.9	1.13	1.11	36.3	38.4	.32	.37	3.7	.88	.84	1.03	1.13	1.62	597.1	42.94	461
D		15:52	1189.2	1188.1	1179.8	17.1	8.2	98	2100	16603	2655	69.5	1.13	1.11	36.4	38.5	.32	.37	3.7	.93	.84	1.03	1.13	1.62	598.1	43.01	461
D		15:57	1190.1	1189.2	1179.9	15.8	8.7	101	2100	16510	2637	69.7	1.13	1.10	36.4	38.2	.32	.37	3.7	.94	.84	1.03	1.13	1.62	599.1	43.08	461
D		16: 2	1191.1	1190.2	1180.8	9.4	9.2	98	2100	16634	2653	69.5	1.13	1.10	36.4	38.2	.32	.37	3.7	1.07	.84	1.03	1.13	1.62	600.1	43.17	461
D		16:13	1192.3	1190.6	1182.3	12.5	-1.1	98	1470	13041	2474	73.5	1.13	1.11	36.5	38.2	.32	.37	3.7	1.00	.84	1.03	1.13	1.62	600.6	43.23	461
D		16:17	1193.1	1192.2	1182.9	10.7	8.9	98	1890	14524	2544	71.3	1.13	1.10	36.5	38.3	.32	.37	3.7	1.06	.84	1.03	1.13	1.62	602.1	43.30	461
D		16:22	1194.1	1193.2	1182.9	11.5	7.7	99	1890	14710	2526	70.3	1.14	1.14	36.5	38.1	.32	.38	3.7	1.02	.84	1.03	1.14	1.62	603.1	43.38	461
D		16:27	1195.1	1194.2	1184.2	10.3	8.7	98	2100	14640	2526	69.9	1.14	1.14	36.5	37.8	.32	.37	3.7	1.02	.84	1.03	1.14	1.62	604.1	43.47	461
D		16:32	1196.1	1195.1	1185.1	15.3	6.8	98	2100	14772	2546	69.9	1.14	1.14	36.5	37.8	.32	.36	2.5	.94	.84	1.03	1.14	1.62	605.1	43.55	461
D		16:37	1197.1	1195.7	1186.3	13.7	8.7	100	2100	14640	2544	69.7	1.14	1.14	36.5	37.8	.32	.37	3.7	.96	.84	1.03	1.14	1.62	605.6	43.63	461
D		16:43	1198.1	1196.6	1187.8	9.4	7.4	100	1890	13345	2526	69.1	1.14	1.14	36.5	37.6	.31	.37	3.7	1.05	.84	1.03	1.14	1.62	606.6	43.74	461
D		16:48	1199.1	1198.1	1189.0	14.7	8.7	100	1890	14640	2526	69.3	1.14	1.14	36.4	37.6	.32	.37	2.5	.94	.84	1.03	1.14	1.62	608.1	43.82	461
T		17: 8	1200.0	1198.6	1192.7	----	----	0	.000	14640	2526	70.7	1.12	1.12	36.5	39.7	.32	.37	3.7	----------	----------	----------	----------	----------	----------	----------	----------
T		17:28	1200.0	1198.6	1196.6	----	----	28	1850	-1303	0	60.3	1.06	1.13	37.1	40.0	.31	.34	2.5	----------	----------	----------	----------	----------	----------	----------	----------

ON-LINE TDC
GEOSERVICES BIT REPORT

* 5/ 6/82 HAMMERHEAD #1

*BIT HEADING :BIT#12 RUN#25
*BIT TYPE :M/TOOT
*BIT IDENTITY :HTC J1
*BIT SIZE : 12.25 INCH
*BIT COST : 7500. $ RIG COST/HR: 5033.
*NOZZLES : 13 13 13 /32NDS @ 95 % EFFICIENCY
*DEPTH IN : 591.42 METERS 3/ 6/82
*DEPTH OUT : 1200.00 METERS 5/ 6/82
*METRAGE : 608.58 METERS
*TOTAL REVOLUTIONS : 258
*DRILLING TIME: 43:52 HR AVERAGE ROP: 13.87 M/HR
*TIME IN HOLE : 57: 5 HR AVERAGE ROP: 10.66 M/HR
*TRIP TIME : 3: 0 HR
*DRILLING COST STANDARD : 588.2 $/MET
*DRILLING COST ON BOTTOM : 461.5 $/MET
*DRILLING COST MINIMUM : 402.1 $/MET

* AVERAGE OVER THE RUN		AVERAGE HYDRAULICS	
*WEIGHT ON BIT	: 8.23 TONS	NOZZLES SPEED	: 170.44 M/S
*ROTATION	: 98.79 RPM	PRESSURE DROP	: 18163 KPA
*FLOW RATE	:2563.82 L/MN	HYDRAULIC POWER	:1040.94 H.P
*STAND PIPE PRESSURE:	16671 KPA		

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

5/ 6/82 TIME 23:50

HAMMERHEAD #1

DEPTH OF EXECUTION 1200.00 METERS
FLOW RATE 2526 L/MN

POWER LAW

MUD DATA	WEIGHT	1.12	SG
	PV	18	CPS
	YP	12.00	LB/FT2
	GEL	5.00	LB/100 FT2
	N	.6674	
	K	.2647	LB/100 FT2
HOLES VOLUMES	WITH PIPES	136.38	M3
	WITHOUT PIPES	142.49	M3
	ANNULAR	125.71	M3
	INSIDE PIPES	10.67	M3

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						475	27				
DR.STRING	.00	1113.20	4.28	5.00		2004	118				
DR.STRING	1113.20	1202.00	2.81	7.75		1241	70				
BIT						17475	987	M/S		167.9	
ANNULUS	1200.00	1111.20	7.75	12.25	9	1	TU	2897.1	55.4	52.3
ANNULUS	1111.20	554.00	5.00	12.25	17	1	TU	2294.9	39.9	37.1
ANNULUS	554.00	143.00	5.00	18.73	14	1	LA	4341.5	15.3	12.9
ANNULUS	143.00	.00	5.00	16.75	6	0	LA	3682.2	19.5	17.0
TOTAL					21321	1204				

ANNULAR PRESSURE LOSSES 46 KPA

EQUIV.CIRCULATING DENSITY 1.12 SG
MAX DEPTH 3569.53

MUD LAG TIMES	S -) B	4.22	MN
	B -) S	49.77	MN
CUTTINGS DATA	SIZE	.20	CM
	DENSITY	2.40	SG
	LAG TIME	56.86	MN
	MAX SLIP VELOCITY	3.07	M/MN
BIT DATA	SIZE	12.25	INCH
	NOZZLES	13 13 13	/32NDS
	NOZZLES EFFICIENCY	95	%
	BIT P. LOSSES	17475	KPA
	H.H.P RATIO	81.96	%
	BIT H.H.P	8.372	
	BIT VELOCITY	167.92	M/S

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

8/ 6/82 — HAMMERHEAD #1

BIT#13 RUN#28 SEQ NBR: 0

STARTING DEPTH 1200.00 METERS

BIT DATA SIZE 8.50
TOOTH REED S11
NOZZLES 12 12 12 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	110	9.20	4.28	5.00	29.00
2	HEAVY WGT DP	1	55.70	3.00	5.00	73.00
3	DRILL COLLAR	1	115.00	2.81	6.50	136.40

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	8.69	143.00	1184.00
OPEN HOLE 1	12.25	1184.00	1200.00

COST DATA BIT COST 5000 $ RIG COST 5833 $/HR
TRIP TIME 3.00 HRS

WEIGHTS HOOK LOAD OFF BOTTOM 88.1 TONS
STRING WEIGHT IN AIR 49.1 TONS

VOLUMES ANNULUS 45.2 M3 IN PIPES 10.3 M3

DEVIATION .0 DEG .000 M / 100 M

HYDRAULICS NOMINAL ANNULUS PRESSURE LOSSES AT 1600 L/MN : 13 KPA

BIT WEAR TYPE EXPONENT .5
EXPECTED: RUN LENGTH 300 METERS TEETH WEAR 4 /8TH

GEOSERVICES — HAMMERHEAD #1 — DATE : 9/ 6/82

ON-LINE TDC

BIT#13 RUN#28 REED S11 BIT DIAMETER : 8.50 inch NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 10 YP = 12 GEL = 5

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	kNm	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
T	8:42	1200.0	1198.6	1177.1	----	----	96	1470	15870	2170	66.8	1.40	1.22	31.1	34.0	.31	.31	3.7								
D	8:57	1201.3	1198.6	1186.3	140.	.0	93	1680	16759	2213	65.6	2.10	1.22	31.7	35.2	.30	.36	3.7	.42	.84	1.03	1.42	1.62	.0	.00	460
T	1:17	1201.7	1200.1	1186.6	----	----	94	1680	20297	2345	65.2	1.26	1.22	32.3	35.7	.31	.36	2.5								
D	1:28	1202.1	1200.6	1201.2	2.5	16.5	81	1680	17379	2327	64.8	1.21	1.22	32.8	35.5	.32	.35	2.5	1.60	.84	1.03	1.21	1.62	2.0	.34	11856
T	1:48	1202.9	1201.1	1201.8	----	----	82	1680	16510	2311	65.4	1.13	1.22	33.5	36.6	.32	.36	2.5								
D	1:52	1203.1	1201.6	1202.4	1.7	17.5	83	1470	16852	2332	65.8	1.13	1.22	33.7	36.5	.32	.37	2.5	2.05	.84	1.03	1.13	1.62	3.0	.73	8798
T	2:12	1203.8	1202.2	1203.0	----	----	51	1680	13997	2311	62.8	1.13	1.22	34.4	36.4	.32	.37	2.5								
D	2:28	1204.2	1202.6	1203.4	1.3	17.8	36	1470	12972	2040	63.0	1.13	1.22	34.8	37.5	.32	.36	2.5	2.04	.84	1.03	1.13	1.62	4.0	1.33	7463
T	2:48	1204.5	1203.1	1204.0	----	----	0	.000	13034	2071	63.4	1.13	1.22	35.2	37.8	.32	.37	2.5								

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ON-LINE TDC
GEOSERVICES                                                    BIT REPORT
*****************************************************************************
*   9/ 6/82                                  HAMMERHEAD #1
*****************************************************************************


*****************************************************************************
*BIT HEADING  :BIT#13 RUN#20
*BIT TYPE     :TOOTH                                                      *
*BIT IDENTITY :REED S11                                                   *
*****************************************************************************
*BIT SIZE     :     8.50 INCH                                            *
*BIT COST     :  5000.   $                RIG COST/HR:  5833.            *
*****************************************************************************
*NOZZLES      :  12 12 12 /32NDS  @  95 % EFFICIENCY                      *
*****************************************************************************
*DEPTH IN     :  1200.00 METERS            8/ 6/82                       *
*DEPTH OUT    :  1204.50 METERS            9/ 6/82                       *
*METRAGE      :     4.50 METERS                                          *
*TOTAL REVOLUTIONS  :      7                                              *
*****************************************************************************
*DRILLING TIME:     1:36 HR              AVERAGE ROP:   2.81 M/HR        *
*TIME IN HOLE :     6:38 HR              AVERAGE ROP:    .68 M/HR        *
*TRIP TIME    :     3: 0 HR                                              *
*****************************************************************************
*DRILLING COST STANDARD  :13579.5 $/MET                                   *
*DRILLING COST ON BOTTOM : 7068.2 $/MET                                   *
*DRILLING COST MINIMUM   : 7038.3 $/MET                                   *
*****************************************************************************
*     AVERAGE OVER THE RUN                    AVERAGE HYDRAULICS          *
*WEIGHT ON BIT       :  12.28 TONS     NOZZLES SPEED  : 176.32 M/S        *
*ROTATION            :  90.00 RPM      PRESSURE DROP  :  19440 KPA        *
*FLOW RATE           :2260.00 L/MN     HYDRAULIC POWER: 982.06 H.P        *
*STAND PIPE PRESSURE:  17500 KPA                                          *
*****************************************************************************
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ON-LINE TDC
GEOSERVICES HYDRAULIC REPORT

* 9/ 6/82 TIME 5: 2 HAMMERHEAD #1

* DEPTH OF EXECUTION 1284.50 METERS *
* FLOW RATE 2260 L/MN POWER LAW *
* *
* MUD DATA WEIGHT 1.13 SG *
* PV 15 CPS *
* YP 8.00 LB/FT2 *
* GEL 2.00 LB/100 FT2 *
* N .7776 *
* K .1645 LB/100 FT2 *
* *
* HOLES VOLUMES WITH PIPES 55.80 M3 *
* WITHOUT PIPES 61.72 M3 *
* ANNULAR 45.46 M3 *
* INSIDE PIPES 10.35 M3 *

	FROM	TO	PIPE ID	PIPE OD	HOLE DIAM	P.LOSSES	H.P	TYPE	CRITICAL FLOW	MUD VELOCITY	CUTTINGS VELOCITY
	METERS		INCH	INCH	INCH	KPA			L/MN	M/MN	M/MN
SURF.EQPT						424	21				
DR.STRING	.00	1039.60	4.28	5.00		1740	88				
DR.STRING	1039.60	1095.30	3.00	5.00		511	26				
DR.STRING	1095.30	1210.30	2.81	6.50		1437	73				
BIT						19440	982	M/S		176.3	
ANNULUS	1284.50	1184.00		6.50	12.25	1	0	TU	2892.2	41.4	38.4
ANNULUS	1184.00	1089.50		6.50	8.69	120	6	TU	1193.0	134.1	130.6
ANNULUS	1089.50	1033.00		5.00	8.69	18	1	TU	1299.9	88.3	85.1
ANNULUS	1033.00	143.00		5.00	8.69	286	14	TU	1299.9	88.3	85.1
ANNULUS	143.00	.00		5.00	16.75	3	0	LA	3147.7	17.5	14.8
TOTAL						23979	1211				

*ANNULAR PRESSURE LOSSES 420 KPA *
* *
*EQUIV.CIRCULATING DENSITY 1.17 SG *
* MAX DEPTH 2578.19 *

* MUD LAG TIMES S -> B 4.58 MN *
* B -> S 20.11 MN *

* CUTTINGS DATA SIZE .20 CM *
* DENSITY 2.40 SG *
* LAG TIME 22.81 MN *
* MAX SLIP VELOCITY 3.44 M/MN *

* BIT DATA SIZE 8.50 INCH *
* NOZZLES 12 12 12 /32NDS *
* NOZZLES EFFICIENCY 95 % *
* BIT P. LOSSES 19440 KPA *
* H.H.P RATIO 81.07 % *
* BIT H.H.P 17.386 *
* BIT VELOCITY 176.32 M/S *

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

* 9/ 6/82 — HAMMERHEAD #1

* BIT#14 RUN#29 SEQ NBR: 0 *

* STARTING DEPTH 1204.50 METERS *

* BIT DATA SIZE 8.50 *
* TOOTH REED S13 *
* NOZZLES 12 12 12 @ 95 % EFFICIENCY *

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	106	9.20	4.28	5.00	29.02
2	HEAVY WGT DP	1	55.70	3.00	5.00	73.00
3	DRILL COLLAR	1	171.60	2.81	6.50	136.40

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	8.69	143.00	1104.00
OPEN HOLE 1	8.50	1104.00	1204.50

* COST DATA BIT COST 7000 $ RIG COST 5833 $/HR *
* TRIP TIME 4.00 HRS *

* WEIGHTS HOOK LOAD OFF BOTTOM 91.4 TONS *
* STRING WEIGHT IN AIR 55.8 TONS *

* VOLUMES ANNULUS 44.1 M3 IN PIPES 10.0 M3 *

* DEVIATION .0 DEG .000 M / 100 M *

* HYDRAULICS NOMINAL ANNULUS PRESSURE LOSSES AT 1800 L/MN : 13 KPA *

* BIT WEAR TYPE EXPONENT .5 *
* EXPECTED: RUN LENGTH 300 METERS TEETH WEAR 3 /8TH *

GEOSERVICES — HAMMERHEAD #1 — DATE : 97 6/82

ON-LINE TDC

BIT#14 RUN#29 REED S13 BIT DIAMETER : 8.50 inch NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 15 YP = 8 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	Hr	$/m
T	10:13	1204.5	1203.1	1204.8	----	----	0	.000	16510	1205	58.8	1.13	1.22	31.5	24.8	.32	.33	1.2	----		----			----		
T	10:33	1204.5	1203.1	1204.3	----	----	91	1680	19334	2364	53.6	1.13	1.22	29.5	32.6	.31	.49	1.2	----		----			----		
D	10:46	1205.1	1203.6	1204.3	4.0	8.7	115	1680	15114	2382	51.4	1.13	1.22	29.9	34.4	.32	.38	1.2	1.63	.84	1.03	1.13	1.62	.5	.11	61057
D	10:54	1206.1	1204.6	1204.6	6.9	10.9	114	1690	12352	2421	52.4	1.13	1.22	30.8	34.0	.33	.38	1.2	1.58	.84	1.03	1.13	1.62	1.5	.25	20962
D	11: 2	1207.1	1205.6	1204.6	7.9	10.8	111	1680	12383	2674	52.0	1.13	1.22	31.8	34.2	.33	.37	2.5	1.46	.84	1.03	1.13	1.62	2.5	.36	12911
D	11: 9	1208.1	1206.6	1205.8	7.8	10.7	105	3360	14121	2692	51.2	1.13	1.22	32.0	34.3	.33	.37	2.5	1.51	.84	1.03	1.13	1.62	3.5	.49	9471
D	11:16	1209.1	1207.6	1206.4	9.6	10.8	106	3570	13717	2684	50.6	1.13	1.22	32.4	34.6	.34	.36	2.5	1.40	.84	1.03	1.13	1.62	4.5	.60	7446
D	11:23	1210.1	1208.7	1207.3	7.4	10.9	105	3570	14057	2715	49.8	1.13	1.22	32.6	34.8	.33	.37	2.5	1.49	.84	1.03	1.13	1.62	5.5	.73	6223
D	11:30	1211.2	1209.6	1208.2	9.5	10.1	105	3570	14090	2646	48.6	1.13	1.22	32.7	34.8	.33	.37	2.5	1.38	.84	1.03	1.13	1.62	6.5	.84	5377
D	11:39	1212.2	1210.7	1209.8	8.3	10.9	105	3780	15579	2692	48.6	1.13	1.22	32.8	34.8	.33	.37	2.5	1.48	.85	1.03	1.13	1.63	7.6	.99	4767
T	11:59	1212.7	1211.1	1211.9	----	----	102	1470	14214	2412	46.6	1.13	1.22	33.4	35.1	.31	.37	2.5	----		----			----		
D	12: 8	1213.1	1211.6	1212.5	2.8	10.7	102	1600	12600	2412	42.2	1.13	1.22	33.2	35.5	.31	.37	3.7	1.85	.85	1.03	1.13	1.63	8.5	1.30	4443
D	12:16	1214.1	1212.6	1212.5	8.7	11.5	100	1680	14121	2412	43.4	1.13	1.22	33.5	35.6	.32	.36	2.5	1.46	.85	1.03	1.13	1.63	9.5	1.42	4046
D	12:23	1215.1	1213.6	1212.5	8.5	12.2	100	1680	14330	2395	42.0	1.13	1.22	33.8	36.0	.32	.36	2.5	1.46	.85	1.03	1.13	1.63	10.5	1.54	3727
D	12:30	1216.1	1214.6	1213.4	7.6	11.2	99	1680	12220	2412	42.0	1.13	1.22	33.8	35.8	.33	.37	2.5	1.48	.85	1.03	1.13	1.63	11.5	1.65	3472
D	12:37	1217.1	1215.6	1214.3	8.8	11.4	100	1680	12755	2445	42.4	1.13	1.22	33.9	35.8	.34	.36	2.5	1.45	.85	1.03	1.13	1.63	12.5	1.78	3247
D	12:44	1218.1	1216.6	1215.2	9.6	12.3	101	1680	11390	2408	41.6	1.13	1.22	34.0	35.9	.34	.36	2.5	1.42	.85	1.03	1.13	1.63	13.5	1.88	3053
D	12:55	1219.1	1217.6	1216.8	4.7	11.3	102	1680	12352	2433	40.8	1.13	1.22	34.1	35.6	.34	.37	2.5	1.63	.85	1.03	1.13	1.63	14.5	2.06	2913
D	13: 3	1220.2	1218.6	1218.0	8.7	12.3	100	1680	12755	2412	41.6	1.13	1.22	34.1	35.8	.33	.37	2.5	1.47	.85	1.03	1.13	1.63	15.5	2.20	2773
D	13:11	1221.2	1219.1	1218.6	7.8	10.4	102	1680	11773	2433	41.4	1.13	1.22	34.1	35.8	.34	.36	3.7	1.52	.85	1.03	1.13	1.63	16.0	2.34	2708
T	13:31	1221.5	1220.1	1220.4	----	----	0	.000	-1366	0	44.0	1.13	1.22	34.1	36.3	.34	.37	2.5	----		----			----		
T	13:51	1221.5	1220.1	1221.3	----	----	0	.000	10676	2447	41.8	1.13	1.22	34.0	35.7	.34	.37	375.	----		----			----		
T	14:11	1221.5	1220.1	1179.6	----	----	0	.000	-1521	0	41.6	1.13	1.22	33.8	35.8	.35	.35	2.5	----		----			----		
T	14:31	1221.5	1220.1	1179.6	----	----	0	.000	-1498	0	43.6	1.13	1.22	33.5	35.8	.35	.35	2.5	----		----			----		
T	14:52	1221.5	1220.1	1179.6	----	----	0	.000	-1241	934	43.4	1.13	1.22	33.8	35.5	.36	.35	2.5	----		----			----		
T	15:12	1221.5	1220.1	1179.6	----	----	0	.000	-1397	0	44.6	1.13	1.22	32.7	34.9	.36	.32	2.5	----		----			----		
T	15:32	1221.5	1220.1	1177.1	----	----	0	.000	403	1449	42.8	1.13	1.22	32.8	23.9	.36	.37	2.5	----		----			----		
D	15:41	1222.1	1220.6	1213.4	4.8	9.1	70	1890	15517	2319	42.8	1.13	1.22	31.2	35.8	.36	.36	2.5	1.22	.85	1.03	1.13	1.63	17.5	2.50	2561
D	15:45	1223.1	1221.6	1213.7	15.8	11.4	72	1870	16417	2357	42.8	1.13	1.22	31.3	35.3	.36	.37	3.7	1.22	.85	1.03	1.13	1.63	18.5	2.56	2441
D	15:51	1224.2	1222.6	1219.2	9.9	7.8	111	1890	17659	2347	55.8	1.13	1.22	31.6	35.3	.35	.38	2.5	1.32	.85	1.03	1.13	1.63	19.5	2.66	2340
D	15:59	1225.1	1223.6	1221.6	8.4	7.3	112	1890	16516	2238	54.4	1.13	1.22	32.8	34.3	.34	.39	2.5	1.31	.85	1.03	1.13	1.63	20.5	2.78	2264
D	16: 8	1226.1	1224.6	1223.2	7.8	8.4	112	1870	17379	2233	54.0	1.13	1.22	32.4	34.4	.35	.39	2.5	1.33	.85	1.03	1.13	1.63	21.5	2.94	2202
D	16:17	1227.2	1225.7	1224.7	8.5	10.8	89	1890	16945	2238	53.8	1.13	1.22	32.7	34.9	.35	.38	2.5	1.36	.85	1.03	1.13	1.63	22.6	3.09	2142
D	16:23	1228.1	1226.6	1225.3	13.2	10.6	92	1890	15766	2236	53.8	1.13	1.22	32.7	35.2	.35	.38	2.5	1.25	.85	1.03	1.13	1.63	23.5	3.19	2079
D	16:30	1229.1	1227.6	1226.2	8.8	10.9	92	1890	16355	2236	53.8	1.13	1.22	33.0	35.6	.35	.39	2.5	1.37	.85	1.03	1.13	1.63	24.5	3.32	2023
D	16:35	1230.1	1228.7	1226.5	16.6	10.8	91	1890	14926	2236	53.6	1.13	1.22	33.2	35.6	.35	.38	2.5	1.20	.85	1.03	1.13	1.63	25.6	3.39	1959
D	16:51	1231.1	1229.6	1228.3	7.5	10.3	86	2100	15828	2078	52.6	1.13	1.22	33.3	35.4	.34	.39	2.5	1.34	.85	1.03	1.13	1.63	26.5	3.58	1913
D	16:56	1232.1	1230.6	1229.8	11.9	9.3	105	1890	17659	2188	52.2	1.15	1.15	33.5	35.7	.34	.39	2.5	1.23	.85	1.03	1.15	1.63	27.5	3.59	1863
D	17: 3	1233.1	1231.7	1230.2	11.1	8.9	115	1890	17938	2198	51.8	1.15	1.15	33.6	35.8	.34	.39	2.5	1.31	.85	1.03	1.15	1.63	28.6	3.69	1816
D	17: 8	1234.1	1232.6	1230.8	12.7	10.5	115	1890	17628	2203	52.6	1.15	1.14	33.7	36.0	.34	.39	2.5	1.26	.85	1.03	1.15	1.63	29.5	3.78	1773
D	17:12	1235.1	1233.6	1230.8	16.1	9.9	117	1890	17969	2203	52.8	1.15	1.14	33.9	35.9	.34	.38	2.5	1.22	.85	1.03	1.15	1.63	30.5	3.84	1727
D	17:17	1236.2	1234.6	1231.7	18.3	10.9	114	1890	17938	2200	52.2	1.15	1.14	34.0	36.0	.34	.39	3.7	1.16	.85	1.03	1.15	1.63	31.5	3.93	1687
D	17:28	1237.1	1235.7	1232.3	19.9	10.8	115	1890	17907	2200	52.2	1.15	1.14	34.1	36.3	.34	.39	2.5	1.17	.85	1.03	1.15	1.63	32.6	3.98	1644
D	17:27	1238.1	1236.6	1233.5	8.6	8.8	116	1890	16446	2189	52.2	1.15	1.14	34.2	36.4	.34	.38	2.5	1.36	.85	1.03	1.15	1.63	33.5	4.10	1618
D	17:33	1239.1	1237.7	1234.4	14.6	8.5	115	1890	16541	2189	51.6	1.15	1.14	34.4	36.4	.34	.38	2.5	1.22	.85	1.03	1.15	1.63	34.6	4.19	1582
D	17:46	1240.1	1238.6	1236.3	22.8	9.7	94	2100	14990	2010	50.6	1.15	1.15	34.2	36.3	.34	.39	2.5	1.01	.85	1.03	1.15	1.63	35.5	4.23	1549
D	17:51	1241.2	1239.9	1237.2	15.3	10.8	119	2100	15641	2012	50.8	1.15	1.15	34.4	36.4	.34	.39	2.5	1.21	.85	1.03	1.15	1.63	36.6	4.31	1515
D	17:54	1242.1	1240.7	1237.5	28.0	9.1	117	1870	15610	2012	50.0	1.15	1.15	34.4	36.1	.34	.38	2.5	1.12	.85	1.03	1.15	1.63	37.6	4.36	1483
D	17:59	1243.1	1241.6	1238.4	11.1	10.8	117	1890	15579	1995	50.2	1.15	1.14	34.5	36.1	.34	.39	2.5	1.32	.85	1.03	1.15	1.63	38.5	4.44	1457

ON-LINE TDC
GEOSERVICES — HYDRAULIC REPORT

9/ 6/82 19:26 — HAMMERHEAD #1

DEPTH OF EXECUTION 1263.92 METERS
FLOW RATE 1939 L/MN — POWER LAW

MUD DATA	WEIGHT	1.15 KG/L
	PV	15 CPS
	YP	8.00
	GEL	2.00
	N	.7776
	K	.1645
HOLES VOLUMES	WITH PIPES	56.15 M3
	WITHOUT PIPES	63.89 M3
	ANNULAR	45.58 M3
	INSIDE PIPES	10.57 M3

	FROM METERS	TO METERS	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES K/C	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						326.6	14				
DR.STRING	.00	1039.60	4.28	5.00		1339.3	58				
DR.STRING	1039.60	1095.30	3.00	5.00		393.3	17				
DR.STRING	1095.30	1266.98	2.81	6.50		1650.1	72				
BIT						14564.	631	M/S		151.3	
ANNULUS	1263.92	1104.00		6.50	8.50	105.1	5	TU	1123.5	127.6	124.2
ANNULUS	1104.00	1092.32		6.50	8.69	69.6	4	TU	1176.0	115.0	111.7
ANNULUS	1092.32	1036.62		5.00	8.69	13.7	1	TU	1281.4	75.6	72.6
ANNULUS	1036.62	143.00		5.00	8.69	220.6	10	TU	1281.4	75.8	72.6
ANNULUS	143.00	.00		5.00	16.75	2.8	0	LA	3102.9	15.0	12.4
TOTAL						10705.	811				

ANNULAR PRESSURE LOSSES 432.0 K/C

EQUIV.CIRCULATING DENSITY 1.18 KG/L
MAX DEPTH 4434.34 METERS

MUD LAG TIMES	S -> B	5.45 MN
	B -> S	23.50 MN
CUTTINGS DATA	SIZE	.20 CM
	DENSITY	2.40 KG/L
	LAG TIME	26.83 MN
	MAX SLIP VELOCITY	3.39 M/MN
BIT DATA	SIZE	8.50 INCH
	NOZZLES	12 12 12 /32NDS
	NOZZLES EFFICIENCY	95 %
	P. LOSSES	1454 K/C
	POWERS RATIO	77.86
	H.P/SQ.INCHES	11.124
	MUD VELOCITY	151.28 M/S

GEOSERVICES — HAMMERHEAD #1 — DATE : 9/ 6/82

ON-LINE TDC

BIT#14 RUN#29 REED S13 BIT DIAMETER : 8.50 inch NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 15 YP = 8 GEL = 2

		DEPTHS				DRILLING PARAMETERS						MUD PARAMETERS						GAS		OVERPRESSURE SURVEY					ACCUMULATED ON BIT		
	TIME	MEASURED	VERTCL	LAGGED	ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT			DCS	NORM	PF	ECD	TRAC	METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit				sg	sg	sg	met	DHr	$/m
D	10: 3	1244.1	1242.7	1239.3	18.2	10.7	117	2100	15486	2012	50.2	1.15	1.14	34.5	36.4	.33	.39	2.5	1.16	.85	1.03	1.15	1.63	39.6	4.51	1430
D	10: 7	1245.1	1243.7	1239.6	12.9	10.7	121	1890	17721	2164	50.2	1.15	1.15	34.5	36.4	.35	.39	2.5	1.27	.85	1.03	1.15	1.63	40.6	4.58	1405
D	10:13	1246.2	1244.7	1240.8	8.3	10.4	119	1890	17597	2167	50.0	1.15	1.14	34.6	36.5	.34	.39	2.5	1.38	.85	1.03	1.15	1.63	41.6	4.67	1384
D	10:17	1247.1	1245.6	1242.1	16.3	9.6	118	1890	16883	2167	50.2	1.15	1.14	34.6	36.6	.34	.40	2.5	1.19	.85	1.03	1.15	1.63	42.5	4.74	1363
D	10:20	1248.1	1246.1	1242.7	20.4	9.5	119	1890	17472	2167	50.2	1.15	1.14	34.6	36.8	.34	.38	2.5	1.14	.85	1.03	1.15	1.63	43.6	4.79	1337
D	10:28	1249.2	1247.8	1243.9	66.8	.3	110	1680	16759	2033	56.2	1.15	1.14	34.1	36.5	.34	.39	3.7	.67	.85	1.03	1.15	1.63	44.7	4.83	1309
D	10:31	1250.1	1248.7	1244.5	18.6	10.1	106	1890	17007	2033	59.2	1.15	1.14	33.8	36.8	.34	.38	2.5	1.14	.85	1.03	1.15	1.63	45.5	4.88	1290
D	10:35	1251.3	1249.6	1245.7	17.3	10.6	105	2100	16790	2033	61.0	1.15	1.14	33.3	37.0	.34	.39	2.5	1.15	.85	1.03	1.15	1.63	46.5	4.94	1271
D	10:39	1252.1	1250.6	1246.8	13.9	10.8	115	1890	17969	2066	64.0	1.15	1.14	33.8	37.1	.34	.39	2.5	1.19	.85	1.03	1.15	1.63	47.5	5.00	1251
D	10:44	1253.1	1251.7	1246.9	17.2	9.3	114	1890	18155	2053	69.3	1.15	1.14	32.6	37.2	.34	.39	3.7	1.18	.85	1.03	1.15	1.63	48.6	5.08	1233
D	10:47	1254.1	1252.7	1247.9	18.1	11.2	114	2100	18652	2033	71.7	1.15	1.14	32.3	37.4	.34	.39	3.7	1.16	.85	1.03	1.15	1.63	49.6	5.13	1214
D	10:50	1255.2	1253.7	1248.5	22.9	9.9	114	1890	18714	2061	73.1	1.15	1.14	32.0	37.3	.34	.39	2.5	1.13	.85	1.03	1.15	1.63	50.6	5.18	1196
D	10:53	1256.2	1254.7	1249.4	18.0	10.6	113	2100	18087	2071	76.1	1.15	1.14	31.7	37.3	.34	.40	3.7	1.16	.85	1.03	1.15	1.63	51.6	5.23	1179
D	10:56	1257.1	1255.7	1250.3	18.4	9.9	114	1890	18776	2050	76.9	1.15	1.14	31.5	37.2	.34	.40	2.5	1.15	.85	1.03	1.15	1.64	52.6	5.29	1163
D	19: 5	1258.1	1256.6	1252.1	16.4	10.4	98	2310	18434	1994	69.7	1.15	1.14	31.2	36.4	.34	.41	2.5	1.15	.85	1.03	1.15	1.64	53.5	5.34	1149
D	19: 8	1259.2	1257.6	1252.4	18.0	10.4	111	2100	16945	1939	70.3	1.15	1.13	31.0	36.2	.34	.42	2.5	1.13	.85	1.03	1.15	1.64	54.5	5.39	1132
D	19:11	1260.2	1258.6	1253.3	17.2	10.4	112	2100	16976	1921	72.3	1.15	1.13	30.6	35.1	.34	.40	1.2	1.15	.85	1.03	1.15	1.64	55.5	5.44	1117
D	19:15	1261.1	1259.6	1254.6	14.6	11.0	115	2100	17472	1921	75.7	1.15	1.13	30.2	34.7	.34	.40	1.2	1.21	.85	1.03	1.15	1.64	56.5	5.49	1103
D	19:19	1262.1	1260.6	1255.5	13.4	10.1	112	2100	17628	1921	78.5	1.15	1.14	29.9	34.8	.34	.40	1.2	1.26	.85	1.03	1.15	1.64	57.5	5.56	1091
D	19:23	1263.1	1261.7	1256.7	12.6	10.1	113	2100	17534	1921	81.7	1.15	1.13	29.3	33.4	.34	.40	1.2	1.25	.85	1.03	1.15	1.64	58.6	5.63	1079

GEOSERVICES — HAMMERHEAD #1 — DATE : 9/ 6/02

ON-LINE TDC

BIT#14 RUN#29 REED S13 BIT DIAMETER : 8.50 inch NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 15 YP = 8 GEL = 2

		DEPTHS				DRILLING PARAMETERS						MUD PARAMETERS							OVERPRESSURE SURVEY				ACCUMULATED ON BIT		
	TIME	MEASURED	VERTCL	LAGGED	ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	NORM	PF	ECD	FRAC	METER	TIME	COST
	Hr:mn	meet	meet	meet	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	meet	DHr	$/m
D	19:29	1264.2	1262.7	1257.9	7.3	12.0	115	2100	17969	1939	73.3	1.15	1.14	28.9	32.6	.34	.40	1.2	1.39	.85	1.03	1.15	1.64	59.6	5.69	1066
D	19:32	1265.1	1263.7	1258.8	20.0	11.4	113	2100	17845	1939	70.7	1.15	1.14	28.8	32.5	.34	.39	1.2	1.15	.85	1.03	1.15	1.64	60.6	5.73	1053
D	19:41	1266.2	1264.7	1260.7	16.9	10.4	111	2100	16021	1904	70.7	1.15	1.15	28.5	32.4	.34	.38	1.2	1.13	.85	1.03	1.15	1.64	61.5	5.79	1041
D	19:43	1267.2	1265.7	1261.0	22.8	10.6	112	2100	16603	1866	70.3	1.15	1.14	28.6	31.8	.34	.39	1.2	1.10	.85	1.03	1.15	1.64	62.6	5.83	1029
D	19:47	1268.2	1266.7	1261.9	24.8	10.3	112	2100	16634	1863	70.1	1.15	1.15	28.6	31.7	.33	.39	1.2	1.09	.85	1.03	1.15	1.64	63.6	5.88	1016
D	19:49	1269.2	1267.7	1262.2	23.1	10.5	116	2100	17007	1866	70.1	1.15	1.14	28.6	31.3	.33	.39	1.2	1.11	.85	1.03	1.15	1.64	64.6	5.92	1004
D	19:52	1270.2	1268.7	1262.8	23.9	11.2	114	2100	16883	1869	70.1	1.15	1.15	28.7	31.2	.33	.38	1.2	1.10	.85	1.03	1.15	1.64	65.6	5.97	993
D	19:55	1271.2	1269.7	1263.7	22.8	11.4	115	2310	17007	1869	70.3	1.15	1.14	28.8	31.0	.33	.38	1.2	1.11	.85	1.03	1.15	1.64	66.6	6.02	983
D	19:57	1272.1	1270.7	1264.8	24.6	11.6	112	2100	16976	1846	70.5	1.15	1.15	28.9	30.8	.33	.38	1.2	1.10	.85	1.03	1.15	1.64	67.6	6.06	972
D	19:59	1273.1	1271.7	1264.6	29.2	12.7	112	2310	16976	1869	70.3	1.15	1.15	29.0	30.5	.33	.39	1.2	1.07	.85	1.03	1.15	1.64	68.6	6.10	960
D	20: 3	1274.2	1272.7	1265.5	18.6	11.4	111	2100	17069	1869	71.9	1.15	1.15	29.2	30.4	.33	.38	1.2	1.10	.85	1.03	1.15	1.64	69.6	6.15	951
D	20: 9	1275.5	1273.8	1265.8	94.3	-.2	11	1470	16014	1581	73.9	1.15	1.16	29.3	30.3	.33	.37	1.2	.88	.85	1.03	1.15	1.64	70.7	6.18	939
D	20: 9	1277.4	1275.7	1265.8	767.	-.3	56	1680	17379	1775	73.7	1.15	1.16	29.3	30.3	.33	.37	1.2	-.00	.85	1.03	1.15	1.64	72.6	6.19	914
D	20:12	1278.2	1276.6	1266.8	15.2	10.5	98	1890	16341	1941	71.9	1.15	1.15	29.4	30.5	.33	.39	1.2	1.20	.85	1.03	1.15	1.64	73.5	6.23	906
D	20:15	1279.1	1277.7	1268.8	28.4	11.1	105	1890	16248	1959	71.5	1.15	1.16	29.5	30.3	.33	.38	.8	1.05	.85	1.03	1.15	1.64	74.6	6.28	897
D	20:20	1280.2	1278.6	1269.8	11.7	10.8	105	2100	16279	1921	71.3	1.15	1.16	29.6	30.3	.33	.37	1.2	1.27	.85	1.03	1.15	1.64	75.5	6.36	893
D	20:25	1281.1	1279.6	1271.6	12.4	12.3	105	2100	16186	1941	71.3	1.15	1.16	29.6	30.4	.33	.37	1.2	1.27	.85	1.03	1.15	1.64	76.5	6.45	887
D	20:30	1282.1	1280.2	1273.8	9.2	10.5	105	2100	18031	1959	71.1	1.15	1.16	29.8	30.2	.34	.37	1.2	1.35	.85	1.03	1.15	1.64	77.1	6.54	885
D	20:37	1283.1	1281.6	1277.7	8.4	11.3	105	2100	17597	1954	70.7	1.15	1.16	29.8	30.2	.34	.37	2.5	1.37	.85	1.03	1.15	1.64	78.5	6.64	879
D	20:42	1284.2	1282.7	1279.2	15.5	12.3	103	2100	17703	1941	70.3	1.15	1.16	29.8	30.1	.34	.37	1.2	1.21	.85	1.03	1.15	1.64	79.6	6.73	874
D	20:48	1285.1	1283.7	1280.5	6.9	12.0	105	2100	17703	1961	70.1	1.15	1.16	29.8	30.4	.34	.37	1.2	1.35	.85	1.03	1.15	1.64	80.6	6.83	870
D	20:53	1286.2	1284.7	1281.4	12.0	11.0	107	2100	17752	1941	69.9	1.15	1.16	29.8	30.2	.34	.38	1.2	1.20	.85	1.03	1.15	1.64	81.6	6.91	865
D	21:10	1287.1	1285.7	1283.8	7.9	10.5	111	1890	18248	1977	68.9	1.15	1.15	29.7	30.9	.34	.38	1.2	1.35	.85	1.03	1.15	1.64	82.6	7.02	863
D	21:16	1288.2	1286.7	1284.7	11.2	10.2	108	2100	18217	1941	68.7	1.15	1.14	29.6	30.9	.34	.37	1.2	1.28	.85	1.03	1.15	1.64	83.6	7.12	860
D	21:20	1289.2	1287.7	1286.0	10.3	10.6	106	2100	17969	1961	68.3	1.15	1.15	29.7	31.0	.34	.38	1.2	1.26	.85	1.03	1.15	1.64	84.6	7.21	855
D	21:24	1290.1	1288.6	1286.6	16.6	11.3	110	2100	18062	1979	68.1	1.15	1.14	29.7	30.7	.34	.38	1.2	1.17	.85	1.03	1.15	1.64	85.5	7.27	850
D	21:29	1291.2	1289.6	1286.6	19.1	10.6	111	1890	15903	1919	68.1	1.15	1.14	29.8	30.9	.35	.38	1.2	1.14	.85	1.03	1.15	1.64	86.5	7.35	845
D	21:33	1292.1	1290.6	1286.6	17.4	11.7	112	2100	16759	1981	67.9	1.15	1.14	29.8	31.1	.34	.38	1.2	1.19	.85	1.03	1.15	1.64	87.5	7.41	840
D	21:39	1293.1	1291.7	1287.5	7.7	11.6	107	2100	17317	1981	68.1	1.15	1.14	29.8	30.9	.34	.38	1.2	1.34	.85	1.03	1.15	1.64	88.6	7.51	836

D	21:51	1295.3	1292.6	1288.7	11.6	.0	0	.000	-683	1886	67.7	1.15	1.17	29.9	30.9	.35	.38	1.2	1.28	.05	1.03	1.15	1.64	89.5	7.60	832
D	22: 3	1304.0	1292.6	1290.8	11.6	.0	0	.000	-1366	0	68.3	1.15	1.20	29.9	30.8	.35	.35	1.2	1.28	.05	1.03	1.15	1.64	89.5	7.60	832
T	22:23	1304.0	1292.6	1294.2	----	----	0	.000	17441	1982	64.0	1.15	1.14	30.0	33.0	.35	.38	1.2	----		----					
T	22:43	1304.0	1292.6	1303.9	----	----	0	-210	17566	1994	64.4	1.15	1.14	30.5	33.3	.35	.38	1.2	----		----					
D	22:50	1304.5	1302.6	1303.9	437.	4.4	98	1070	18217	1994	65.4	1.15	1.13	30.6	33.3	.35	.40	1.2	.29	.85	1.03	1.15	1.65	99.5	7.60	750
D	22:50	1305.1	1303.4	1303.9	144.	5.6	115	2100	18310	1997	65.2	1.15	1.14	30.6	33.3	.35	.39	1.2	.46	.85	1.65	1.15	1.74	100.3	7.60	744
D	22:51	1306.2	1304.3	1303.9	121.	7.1	117	2520	18279	2014	65.0	1.15	1.13	30.6	33.2	.35	.39	1.2	.59	.85	1.44	1.15	1.84	101.2	7.61	739
D	22:51	1307.2	1305.8	1303.9	164.	8.1	115	3150	18240	2014	64.8	1.15	1.14	30.7	33.0	.35	.39	1.2	.53	.85	1.54	1.15	1.89	102.7	7.62	728
D	22:52	1308.1	1306.2	1303.9	127.	9.8	118	3360	18590	2012	64.6	1.15	1.14	30.7	32.9	.35	.40	1.2	.59	.85	1.44	1.15	1.84	103.1	7.62	725
D	22:52	1309.1	1307.3	1303.9	261.	7.9	115	2940	18590	2032	64.6	1.15	1.14	30.7	32.8	.35	.39	1.2	.43	.85	1.03	1.15	1.65	104.2	7.63	718
D	22:52	1310.2	1308.7	1303.9	167.	8.8	115	2940	18714	1999	64.4	1.15	1.14	30.8	32.6	.35	.39	1.2	.53	.85	1.55	1.15	1.89	105.6	7.64	709
D	22:53	1311.1	1309.7	1303.9	92.0	6.9	115	3150	17814	1994	64.2	1.15	1.14	30.7	32.1	.35	.40	1.2	.67	.85	1.03	1.15	1.65	106.6	7.64	703
D	22:53	1312.0	1310.1	1303.9	123.	8.9	115	3360	18714	2014	64.0	1.15	1.14	30.7	31.7	.35	.40	1.2	.63	.85	1.39	1.15	1.82	107.0	7.65	700
D	22:59	1313.1	1311.1	1303.9	83.2	-.6	108	1890	16666	1820	64.4	1.15	1.14	30.8	31.3	.34	.40	2.5	.71	.85	1.03	1.15	1.65	108.0	7.66	694
D	22:59	1314.0	1312.3	1303.9	161.	8.8	110	2520	16976	1848	64.4	1.15	1.14	30.8	31.4	.34	.40	2.5	.46	.85	1.64	1.15	1.94	109.2	7.67	687
D	23: 0	1315.0	1313.6	1303.9	151.	8.7	113	2520	17783	1686	64.2	1.15	1.14	30.8	31.4	.34	.39	2.5	.54	.85	1.53	1.15	1.89	110.5	7.68	680
D	23: 0	1316.1	1314.3	1303.9	119.	9.6	117	3780	17987	1939	64.0	1.15	1.14	30.9	31.4	.34	.39	2.5	.63	.85	1.39	1.15	1.82	111.2	7.68	676
D	23: 1	1317.0	1315.1	1303.9	98.4	8.3	116	4200	18031	1939	63.8	1.15	1.14	30.8	31.4	.34	.39	1.2	.67	.85	1.03	1.15	1.65	112.0	7.69	671
D	23: 2	1318.1	1316.2	1303.9	83.3	9.2	116	4620	17930	1939	63.6	1.15	1.14	30.9	31.4	.34	.40	1.2	.69	.85	1.03	1.15	1.65	113.1	7.71	666
D	23: 2	1319.3	1317.7	1303.9	104.	9.5	116	4410	18124	1939	63.6	1.15	1.14	30.9	31.1	.34	.40	2.5	.64	.85	1.37	1.15	1.81	114.6	7.72	657

GEOSERVICES — HAMMERHEAD #1 — DATE : 9/ 6/82

ON-LINE TDC

BIT#14 RUN#29 REED S13 BIT DIAMETER : 8.50 inch NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 15 YP = 8 GEL = 2

	TIME	DEPTHS MEASURED	VERTCL	LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hrmn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	23: 3	1320.3	1318.8	1303.9	87.6	9.2	119	4620	18031	1939	63.4	1.15	1.14	30.9	30.9	.34	.40	2.5	.75	.85	1.03	1.15	1.65	115.7	7.73	652
D	23: 4	1321.1	1319.3	1303.9	68.2	8.7	116	4620	18124	1949	63.4	1.15	1.14	30.8	30.8	.34	.40	1.2	.77	.85	1.03	1.15	1.65	116.2	7.74	650
D	23: 4	1322.1	1320.1	1303.9	84.2	8.9	117	4410	17907	1939	63.2	1.15	1.15	30.9	30.8	.34	.40	2.5	.71	.85	1.03	1.15	1.65	117.8	7.75	645
D	23:10	1323.1	1321.1	1303.9	41.6	8.6	108	3760	15921	1936	64.0	1.15	1.15	30.9	30.7	.34	.39	1.2	.77	.85	1.03	1.15	1.65	118.8	7.77	641
D	23:10	1324.1	1322.2	1303.9	83.1	9.6	119	4830	16169	1868	64.0	1.15	1.15	31.0	30.8	.35	.40	1.2	.72	.85	1.03	1.15	1.65	119.1	7.78	635
D	23:11	1325.1	1323.2	1303.9	110.	9.6	121	4620	16107	1828	63.8	1.15	1.15	30.9	30.8	.34	.39	1.2	.62	.85	1.40	1.15	1.83	120.1	7.78	630
D	23:12	1326.1	1324.3	1303.9	84.8	9.6	119	4620	16045	1840	63.4	1.15	1.15	30.8	30.8	.35	.39	1.2	.72	.85	1.03	1.15	1.65	121.2	7.80	625
D	23:12	1327.1	1325.7	1303.9	102.	8.5	117	4620	16466	1869	63.2	1.15	1.15	30.9	30.9	.35	.39	1.2	.65	.85	1.03	1.15	1.65	122.6	7.81	619
D	23:13	1328.0	1326.2	1303.9	119.	10.1	121	4620	16483	2015	63.2	1.15	1.14	30.9	30.9	.35	.39	1.2	.62	.85	1.40	1.15	1.83	123.1	7.81	617
D	23:14	1329.3	1327.7	1303.9	69.1	10.0	121	4830	16483	1995	63.0	1.15	1.15	30.9	30.7	.35	.41	1.2	.77	.85	1.03	1.15	1.65	124.6	7.83	610
D	23:14	1330.1	1328.2	1303.9	61.3	10.5	119	4830	17876	2012	62.8	1.15	1.15	30.9	30.6	.35	.39	1.2	.82	.85	1.03	1.15	1.65	125.8	7.84	608
D	23:19	1331.0	1329.2	1303.9	79.7	-.7	84	1680	17100	1630	63.6	1.15	1.17	30.9	30.8	.35	.39	1.2	.74	.85	1.03	1.15	1.65	126.1	7.85	604
D	23:20	1332.0	1330.3	1303.9	126.	9.2	102	2520	16945	1866	63.4	1.15	1.17	30.9	30.2	.35	.39	1.2	.41	.85	1.03	1.15	1.65	127.2	7.86	599
D	23:21	1333.2	1331.8	1303.9	65.3	8.1	116	4620	17224	1921	63.2	1.15	1.17	30.9	30.2	.35	.38	1.2	.66	.85	1.03	1.15	1.65	128.7	7.87	593
D	23:21	1334.0	1332.2	1303.9	72.8	9.4	114	4830	17162	1939	63.0	1.15	1.16	30.8	30.2	.35	.38	1.2	.72	.85	1.03	1.15	1.65	129.1	7.88	591
D	23:22	1335.1	1333.7	1303.9	100.	9.3	115	4620	17255	1921	62.8	1.15	1.16	30.8	30.2	.35	.38	1.2	.66	.85	1.03	1.15	1.65	130.6	7.89	585
D	23:23	1336.2	1334.2	1303.9	91.1	9.3	115	4830	17224	1921	62.6	1.15	1.16	30.8	29.9	.35	.39	1.2	.76	.85	1.03	1.15	1.65	131.7	7.91	580
D	23:23	1337.1	1335.7	1305.5	93.8	9.3	115	4620	17286	1954	62.6	1.15	1.17	30.8	29.9	.35	.39	1.2	.68	.85	1.03	1.15	1.65	132.6	7.92	577
D	23:24	1338.1	1336.7	1305.5	63.7	9.6	115	4830	17131	1921	62.4	1.15	1.17	30.8	30.2	.35	.40	1.2	.74	.85	1.03	1.15	1.65	133.6	7.93	573
D	23:25	1339.0	1337.2	1307.9	56.3	7.8	116	4620	17224	1939	62.4	1.15	1.16	30.8	30.1	.35	.41	1.2	.77	.85	1.03	1.15	1.65	134.1	7.94	572
D	23:26	1340.1	1338.7	1310.3	75.3	.0	0	.000	16417	1924	62.2	1.15	1.16	30.8	29.7	.35	.41	1.2	.75	.85	1.03	1.15	1.65	135.6	7.96	566
D	23:31	1341.1	1339.7	1312.8	60.0	6.2	111	3360	15952	1886	62.8	1.15	1.17	30.8	29.8	.35	.39	1.2	.72	.85	1.03	1.15	1.65	136.6	7.97	563
D	23:32	1342.1	1340.7	1313.4	81.9	7.3	111	4200	16076	1866	62.4	1.15	1.17	30.7	29.6	.35	.39	1.2	.65	.85	1.36	1.45	1.81	137.6	7.99	559
D	23:33	1343.0	1341.2	1315.2	63.3	7.9	113	4620	16107	1886	62.0	1.15	1.17	30.6	30.1	.35	.40	1.2	.72	.85	1.03	1.15	1.65	138.1	8.00	557
D	23:35	1344.1	1342.1	1318.3	57.7	8.1	111	4830	16014	1886	61.6	1.15	1.17	30.6	30.2	.35	.40	1.2	.75	.85	1.03	1.15	1.65	139.0	8.03	554
D	23:38	1345.0	1343.2	1321.0	24.5	8.7	114	4620	15952	1904	61.2	1.15	1.16	30.5	29.9	.35	.40	1.2	.97	.85	1.03	1.15	1.65	140.1	8.06	552
D	23:40	1346.0	1344.6	1322.2	36.1	8.4	112	4620	15859	1886	60.6	1.15	1.16	30.5	29.9	.35	.38	1.2	.87	.85	1.03	1.15	1.65	141.5	8.12	549
D	23:41	1347.0	1345.1	1323.4	54.4	7.8	111	4620	15859	1889	60.4	1.15	1.16	30.5	29.8	.35	.39	2.5	.77	.85	1.03	1.15	1.65	142.0	8.14	547
D	23:42	1348.0	1346.2	1325.3	61.1	8.1	111	4620	16076	1886	60.4	1.15	1.16	30.4	30.0	.36	.39	1.2	.73	.85	1.03	1.15	1.66	143.1	8.15	544
D	23:43	1349.2	1347.6	1325.3	87.5	7.5	111	4620	15921	1906	60.4	1.15	1.17	30.4	30.1	.35	.39	2.5	.63	.85	1.39	1.15	1.83	144.5	8.16	539
D	23:46	1350.5	1347.6	1329.8	87.5	.0	0	.000	3567	1866	60.8	1.15	1.17	30.3	30.0	.36	.39	1.2	.63	.85	1.39	1.15	1.83	144.5	8.17	539
D	23:51	1351.0	1349.1	1331.4	223.	5.9	98	2310	16720	1995	60.6	1.15	1.16	30.2	30.1	.35	.39	1.2	.41	.85	1.03	1.15	1.66	146.0	8.18	534
D	23:52	1352.1	1350.2	1331.4	77.1	8.3	118	3570	16770	1919	60.0	1.15	1.16	30.2	30.0	.35	.39	1.2	.62	.85	1.41	1.15	1.84	147.1	8.20	531
D	23:53	1353.1	1351.2	1332.9	52.4	7.8	118	3570	16759	1939	59.6	1.15	1.16	30.1	30.4	.35	.40	1.2	.73	.85	1.03	1.15	1.66	148.1	8.21	528
D	23:54	1354.1	1352.4	1334.4	66.5	7.8	118	3570	16720	1927	59.2	1.15	1.16	30.1	30.6	.35	.39	1.2	.62	.85	1.40	1.15	1.83	149.3	8.22	524
D	23:55	1355.4	1353.7	1335.6	69.0	7.8	111	4410	16021	1919	59.2	1.15	1.17	30.1	30.4	.36	.40	1.2	.60	.85	1.03	1.15	1.66	150.6	8.24	521
D	23:55	1356.1	1354.1	1337.5	58.9	7.7	110	4620	16021	1939	59.0	1.15	1.16	30.1	30.3	.36	.39	1.2	.75	.85	1.03	1.15	1.66	151.6	8.25	518
D	23:56	1357.0	1355.3	1337.5	107.	5.4	110	3990	16003	1939	59.2	1.15	1.17	30.1	30.3	.36	.40	1.2	.44	.85	1.03	1.15	1.66	152.2	8.26	515
D	23:56	1358.0	1356.2	1338.4	107.	6.3	107	4410	16914	1937	59.0	1.15	1.17	30.1	30.2	.36	.40	1.2	.54	.85	1.53	1.15	1.89	153.1	8.27	513
D	0: 8	1359.2	1357.8	1343.6	85.1	6.5	109	4620	16931	2033	57.2	1.15	1.16	29.9	31.0	.35	.40	1.2	.61	.85	1.42	1.15	1.84	154.7	8.29	509
D	0: 8	1360.1	1358.2	1344.2	46.5	5.5	107	4200	16262	1780	57.0	1.15	1.16	29.8	31.1	.36	.39	1.2	.74	.85	1.03	1.15	1.66	155.1	8.30	508
D	0: 9	1361.0	1359.2	1344.5	73.2	7.5	110	4410	16231	1884	56.8	1.15	1.16	29.9	31.0	.36	.39	1.2	.67	.85	1.03	1.15	1.66	156.1	8.31	505
D	0:10	1362.1	1360.2	1344.8	91.6	7.3	108	4620	16169	1864	56.6	1.15	1.16	29.8	30.9	.36	.39	1.2	.59	.85	1.46	1.15	1.86	157.1	8.33	502
D	0:11	1363.0	1361.2	1345.1	87.5	7.5	107	4620	16076	1882	56.4	1.15	1.16	29.8	30.9	.36	.39	1.2	.60	.85	1.43	1.15	1.85	158.1	8.34	499
D	0:12	1364.1	1362.2	1345.4	59.6	8.0	108	4620	16107	1884	56.2	1.15	1.16	29.8	30.9	.36	.39	1.2	.70	.85	1.03	1.15	1.66	159.1	8.36	497
D	0:13	1365.2	1363.3	1345.4	116.	7.2	108	4620	15921	1924	56.2	1.15	1.16	29.8	30.6	.36	.40	1.2	.63	.85	1.40	1.15	1.83	160.7	8.37	493
D	0:14	1366.0	1364.2	1346.3	72.9	7.7	107	5670	16876	1884	56.0	1.15	1.16	29.8	30.4	.36	.40	1.2	.63	.85	1.40	1.15	1.83	161.1	8.39	492
D	0:21	1367.1	1365.1	1349.4	45.4	.9	101	3150	14336	1810	56.2	1.15	1.16	29.7	30.2	.36	.40	1.2	.74	.85	1.03	1.15	1.66	162.0	8.41	489
D	0:23	1368.1	1366.7	1349.7	52.8	6.3	108	5040	16021	1921	55.6	1.15	1.21	29.7	30.2	.36	.40	1.2	.70	.86	1.03	1.15	1.66	163.6	8.43	486

GEOSERVICES — HAMMERHEAD #1 — DATE : 10/ 6/82

ON-LINE TDC

BIT#14 RUN#29 REED S13 BIT DIAMETER : 8.50 inch NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 15 YP = 8 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	0:24	1369.2	1367.6	1350.3	55.0	3.8	100	4830	16759	1939	55.2	1.15	1.14	29.7	30.4	.36	.40	1.2	.68	.86	1.03	1.15	1.66	164.5	8.45	484
D	0:25	1370.1	1368.2	1350.6	59.0	5.4	100	4830	16821	1939	54.8	1.15	1.14	29.7	29.9	.36	.39	1.2	.67	.86	1.03	1.15	1.66	165.1	8.47	483
D	0:26	1371.2	1369.8	1351.5	73.5	6.4	100	4620	16572	1924	54.6	1.15	1.15	29.7	30.0	.36	.41	1.2	.67	.86	1.03	1.15	1.66	166.7	8.48	479
D	0:26	1372.0	1370.6	1352.4	66.4	7.1	110	4830	16634	1939	54.4	1.15	1.15	29.7	30.3	.37	.41	1.2	.69	.86	1.03	1.15	1.66	167.5	8.50	477
D	0:27	1373.1	1371.2	1353.6	58.2	8.4	110	4830	16541	1957	54.2	1.15	1.15	29.6	30.2	.37	.40	1.2	.75	.86	1.03	1.15	1.66	168.1	8.51	476
D	0:28	1374.1	1372.7	1354.8	71.1	7.3	100	4830	16510	1941	54.2	1.15	1.15	29.6	30.3	.37	.41	1.2	.67	.86	1.03	1.15	1.66	169.6	8.53	472
D	0:29	1375.2	1373.7	1356.1	68.7	9.0	110	4830	16479	1939	54.2	1.15	1.15	29.7	30.3	.37	.41	1.2	.70	.86	1.03	1.15	1.66	170.6	8.54	470
D	0:30	1376.1	1374.1	1356.1	62.4	8.8	100	5040	16572	1939	54.8	1.15	1.15	29.7	29.9	.37	.42	1.2	.72	.86	1.03	1.15	1.66	171.0	8.55	469
D	0:40	1377.1	1375.1	1358.2	48.0	6.5	100	4830	16634	1937	53.8	1.15	1.15	29.6	30.3	.37	.39	1.2	.76	.86	1.03	1.15	1.66	172.0	8.57	467
D	0:41	1378.1	1376.1	1358.2	87.4	7.9	107	4830	16720	1939	53.6	1.15	1.15	29.6	30.6	.37	.39	1.2	.64	.86	1.38	1.15	1.82	173.0	8.59	465
D	0:42	1379.0	1377.3	1358.8	52.9	7.9	100	4830	16720	1947	53.2	1.15	1.15	29.6	30.0	.37	.41	1.2	.75	.86	1.03	1.15	1.66	174.2	8.61	462
D	0:43	1380.0	1378.1	1360.0	51.9	8.2	100	4620	16790	1957	53.2	1.15	1.15	29.5	30.1	.37	.40	1.2	.76	.86	1.03	1.15	1.66	175.0	8.62	460
D	0:44	1381.0	1379.2	1360.9	63.1	8.1	100	4620	16666	1957	53.2	1.15	1.15	29.6	30.6	.37	.40	1.2	.69	.86	1.03	1.15	1.66	176.1	8.64	458
D	0:45	1382.1	1380.2	1362.2	51.0	8.3	109	4830	16666	1957	53.0	1.15	1.15	29.6	30.7	.37	.40	1.2	.73	.86	1.03	1.15	1.66	177.1	8.66	456
D	0:46	1383.1	1381.1	1363.4	57.1	8.3	108	4620	16697	1952	53.0	1.15	1.16	29.5	30.8	.37	.41	1.2	.77	.86	1.03	1.15	1.66	178.0	8.67	454
D	0:47	1384.1	1382.2	1364.6	56.3	7.8	109	4620	16845	1939	53.2	1.15	1.16	29.5	30.4	.37	.40	1.2	.75	.86	1.03	1.15	1.66	179.1	8.69	452
D	0:48	1385.1	1383.3	1365.8	49.1	9.2	94	3570	16541	1939	53.0	1.15	1.17	29.5	30.8	.37	.41	1.2	.75	.86	1.03	1.15	1.66	180.1	8.71	450
D	1: 6	1386.8	1384.2	1376.2	12.8	7.6	104	6300	16231	1940	53.8	1.15	1.16	29.3	30.7	.38	.41	2.5	1.11	.86	1.03	1.15	1.66	181.1	8.76	449
D	1: 7	1387.0	1385.3	1376.2	57.2	5.2	110	6510	16200	1950	53.6	1.15	1.16	29.3	30.5	.38	.39	1.2	.67	.86	1.03	1.15	1.66	182.2	8.78	447
D	1: 8	1388.2	1386.7	1376.2	76.8	7.2	100	7140	16107	1957	53.4	1.15	1.16	29.2	30.7	.37	.40	1.2	.67	.86	1.03	1.15	1.66	183.6	8.79	444
D	1: 8	1389.1	1387.2	1376.2	95.1	7.2	111	6930	16293	1960	53.2	1.15	1.16	29.3	30.9	.38	.40	2.5	.57	.86	1.49	1.15	1.88	184.1	8.80	443
D	1: 9	1390.1	1388.2	1376.2	76.9	5.4	100	7350	16324	1942	53.2	1.15	1.16	29.3	30.9	.38	.40	2.5	.63	.86	1.39	1.15	1.83	185.1	8.81	441
D	1:10	1391.0	1389.6	1376.8	71.7	5.9	100	7350	16262	1942	53.2	1.15	1.16	29.2	30.7	.38	.40	2.5	.61	.86	1.42	1.15	1.85	186.5	8.83	439
D	1:11	1392.1	1390.2	1377.7	75.3	9.2	109	7770	16231	1978	53.4	1.15	1.16	29.2	30.4	.38	.40	2.5	.65	.86	1.37	1.15	1.82	187.1	8.84	438
D	1:12	1393.0	1391.2	1377.7	73.6	8.5	100	7350	16262	1940	53.4	1.15	1.16	29.2	30.3	.38	.41	2.5	.72	.86	1.03	1.15	1.66	188.1	8.85	436
D	1:13	1394.0	1392.3	1379.8	55.0	8.2	109	7770	16169	1942	53.4	1.15	1.16	29.2	30.6	.38	.41	2.5	.74	.86	1.03	1.15	1.67	189.2	8.88	434
D	1:31	1395.1	1393.7	1385.8	37.9	6.2	103	5670	18155	2050	53.2	1.15	1.15	29.4	30.9	.38	.41	1.2	.78	.86	1.03	1.15	1.67	190.6	8.92	432
D	1:33	1396.1	1394.7	1385.8	28.8	7.8	102	6300	15548	1906	52.8	1.15	1.15	29.4	30.7	.38	.40	1.2	.87	.86	1.03	1.15	1.67	191.6	8.95	431
D	1:35	1397.1	1395.7	1385.3	31.8	7.8	103	6300	15486	1914	52.4	1.15	1.15	29.4	31.1	.38	.40	1.2	.88	.86	1.03	1.15	1.67	192.6	8.98	430
D	1:37	1398.1	1396.2	1387.1	27.1	8.4	103	6510	15455	1934	52.4	1.15	1.15	29.4	30.3	.38	.42	1.2	.89	.86	1.03	1.15	1.67	193.1	9.01	429
D	1:39	1399.1	1397.1	1389.9	29.7	7.7	103	6300	15517	1921	52.8	1.15	1.17	29.5	30.9	.38	.42	1.2	.87	.86	1.03	1.15	1.67	194.0	9.05	428
D	1:41	1400.0	1398.6	1390.8	34.5	8.6	103	6510	15424	1921	52.0	1.15	1.15	29.5	30.5	.38	.43	2.5	.84	.86	1.03	1.15	1.67	195.5	9.08	426
D	1:43	1401.1	1399.7	1393.2	38.3	9.1	104	6510	15393	1939	52.2	1.15	1.16	29.5	30.2	.38	.43	1.2	.88	.86	1.03	1.15	1.67	196.6	9.12	425
D	1:45	1402.1	1400.6	1393.9	28.7	7.8	105	6300	15424	1906	52.0	1.15	1.15	29.5	30.1	.38	.43	2.5	.89	.86	1.03	1.15	1.67	197.5	9.14	424
D	1:46	1403.1	1401.2	1393.9	31.4	8.7	105	6300	15393	1921	51.8	1.15	1.15	29.5	30.3	.38	.42	2.5	.87	.86	1.03	1.15	1.67	198.1	9.17	423
T	2: 7	1403.9	1402.2	1399.0	----	----	0	.000	16130	2033	50.6	1.15	1.14	29.6	32.7	.38	.41	2.5	----------	----------	----------	----------	----------	----------	----------	----------
T	2:27	1403.9	1402.2	1403.6	----	----	18	1260	15797	2015	50.0	1.15	1.14	30.5	34.4	.39	.42	1.2	----------	----------	----------	----------	----------	----------	----------	----------
D	2:37	1404.0	1402.2	1403.6	44.2	3.0	0	1260	-1397	0	61.0	1.15	1.19	30.8	34.1	.38	.37	1.2	.79	.86	1.03	1.15	1.67	199.0	9.20	422
T	2:57	1404.2	1402.6	1403.6	----	----	0	.000	5866	1135	63.6	1.15	1.16	30.7	32.4	.37	.39	1.2	----------	----------	----------	----------	----------	----------	----------	----------

ON-LINE TDC
GEOSERVICES DIT REPORT

* 10/ 6/82 HAMMERHEAD #1

*BIT HEADING :BIT#14 RUN#29
*BIT TYPE :TOOTH
*BIT IDENTITY :REED S13
*BIT SIZE : 8.50 INCH
*BIT COST : 7000. $ RIG COST/HR: 5833.
*NOZZLES : 12 12 12 /32NDS @ 95 % EFFICIENCY
*DEPTH IN : 1204.50 METERS 9/ 6/82
*DEPTH OUT : 1406.00 METERS 10/ 6/82
*METRAGE : 201.50 METERS
*TOTAL REVOLUTIONS : 59
*DRILLING TIME: 9:22 HR AVERAGE ROP: 21.52 M/HR
*TIME IN HOLE : 16:31 HR AVERAGE ROP: 12.20 M/HR
*TRIP TIME : 4: 0 HR
*DRILLING COST STANDARD : 620.5 $/MET
*DRILLING COST ON BOTTOM : 421.5 $/MET
*DRILLING COST MINIMUM : 421.3 $/MET

AVERAGE OVER THE RUN		AVERAGE HYDRAULICS	
*WEIGHT ON BIT	: 8.30 TONS	NOZZLES SPEED	: 150.58 M/S
*ROTATION	: 106.00 RPM	PRESSURE DROP	: 14420 KPA
*FLOW RATE	:1930.00 L/MN	HYDRAULIC POWER:	622.45 H.P
*STAND PIPE PRESSURE:	16400 KPA		

ON-LINE TDC
GEOSERVICES — HYDRAULIC REPORT

* 10/ 6/82 TIME 3:44 — HAMMERHEAD #1

DEPTH OF EXECUTION	1406.00 METERS		
FLOW RATE	1930 L/MN		POWER LAW
MUD DATA	WEIGHT	1.15 SG	
	PV	10 CPS	
	YP	10.00 LB/FT2	
	GEL	2.00 LB/100 FT2	
	N	.6374	
	K	.3379 LB/100 FT2	
HOLES VOLUMES	WITH PIPES	60.92 M3	
	WITHOUT PIPES	60.29 M3	
	ANNULAR	48.98 M3	
	INSIDE PIPES	11.94 M3	

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						299	13				
DR.STRING	.00	1186.00	4.28	5.00		1398	60				
DR.STRING	1186.00	1242.50	3.00	5.00		360	16				
DR.STRING	1242.50	1414.10	2.81	6.50		1509	65				
BIT						14428	622	M/S		150.6	
ANNULUS	1406.00	1234.40		6.50	8.50	286	9	TU	1094.7	127.0	123.4
ANNULUS	1234.40	1184.00		5.00	8.50	14	1	TU	1327.1	88.6	77.5
ANNULUS	1184.00	1178.70		5.00	8.69	1	0	TU	1384.2	75.4	72.3
ANNULUS	1178.70	143.00		5.00	8.69	234	10	TU	1384.2	75.4	72.3
ANNULUS	143.00	.00		5.00	16.75	3	0	LA	4073.2	14.9	12.7
TOTAL						18451	796				

ANNULAR PRESSURE LOSSES	458 KPA	
EQUIV.CIRCULATING DENSITY	1.18 SG	
MAX DEPTH	5069.20	
MUD LAG TIMES S -> B	6.19 MN	
B -> S	25.38 MN	
CUTTINGS DATA SIZE	.20 CM	
DENSITY	2.40 SG	
LAG TIME	27.68 MN	
MAX SLIP VELOCITY	3.52 M/MN	
BIT DATA SIZE	8.50 INCH	
NOZZLES	12 12 12 /32NDS	
NOZZLES EFFICIENCY	95 %	
BIT P. LOSSES	14428 KPA	
H.H.P RATIO	78.19 %	
BIT H.H.P	10.969	
BIT VELOCITY	150.58 M/S	

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

10/ 6/82 — HAMMERHEAD #1

BIT#15 RUN#30 SEQ NBR: 0

STARTING DEPTH 1406.00 METERS

BIT DATA SIZE 8.50
INSERT REED HSS1
NOZZLES 11 11 11 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	127	9.20	4.20	5.00	29.82
2	HEAVY WGT DP	1	55.70	3.00	5.00	73.80
3	DRILL COLLAR	1	173.34	2.81	6.50	136.40

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	8.69	143.00	1184.00
OPEN HOLE 1	8.50	1184.00	1406.00

COST DATA BIT COST 8000 $ RIG COST 5033 $/HR
TRIP TIME 4.00 HRS

WEIGHTS HOOK LOAD OFF BOTTOM 96.3 TONS
STRING WEIGHT IN AIR 81.7 TONS

VOLUMES ANNULUS 49.8 M3 IN PIPES 11.9 M3

DEVIATION 1.5 DEG 2.61 M / 100 M

HYDRAULICS NOMINAL ANNULUS PRESSURE LOSSES AT 1600 L/MN : 13 KPA

BIT WEAR TYPE EXPONENT .2
EXPECTED: RUN LENGTH 300 METERS TEETH WEAR 3 /8TH

GEOSERVICES — HAMMERHEAD #1 — DATE : 10/ 6/02

ON LINE TDC

BIT#15 RUN#30 REED HSS1 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 10 YP = 10 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit		sg	sg	sg	sg	met	Hr	$/m
T	9:56	1406.0	1404.5	1403.6	----	----	71	1090	17224	1517	47.2	1.15	1.17	27.3	18.8	.39	.41	-1.2	----	----	----	----	----	----	----	----
D	9:57	1407.2	1407.5	1403.6	43.7	8.9	69	2100	16634	1903	47.0	1.15	1.17	27.2	19.7	.40	.40	-1.2	.01	.86	1.03	1.15	1.67	3.0	.01	10394
D	10: 7	1408.2	1408.5	1405.7	8.2	7.7	123	2310	18186	1792	45.6	1.15	1.15	25.3	20.2	.38	.39	.0	1.31	.86	1.03	1.15	1.67	4.0	.05	7914
D	10: 8	1409.1	1409.0	1405.7	39.9	9.3	121	5670	18310	1775	45.2	1.15	1.15	25.2	20.7	.38	.39	.0	.98	.86	1.03	1.15	1.67	4.5	.08	7050
D	10:10	1410.2	1410.5	1405.7	36.5	8.3	122	5670	18341	1792	45.0	1.15	1.15	25.2	29.1	.38	.39	.0	1.03	.86	1.03	1.15	1.67	6.0	.10	5300
D	10:12	1411.2	1411.5	1406.0	37.6	9.7	120	5460	18186	1792	45.2	1.15	1.16	25.3	29.1	.38	.39	.0	1.00	.86	1.03	1.15	1.67	7.0	.13	4580
D	10:14	1412.2	1412.5	1406.0	36.6	8.0	123	5250	17930	1810	45.0	1.15	1.16	25.3	28.8	.39	.40	1.2	1.02	.86	1.03	1.15	1.67	8.0	.16	4024
D	10:15	1413.2	1413.5	1406.0	30.5	10.2	120	5040	17721	1810	45.0	1.15	1.16	25.4	28.9	.39	.41	.0	1.07	.86	1.03	1.15	1.67	9.0	.19	3601
D	10:17	1414.2	1414.5	1406.0	37.5	8.9	122	6090	17441	1790	44.8	1.15	1.16	25.5	29.0	.38	.40	.0	1.01	.86	1.03	1.15	1.67	10.0	.22	3263
D	10:31	1416.8	1417.2	1406.7	452.	10.5	127	4200	16076	1806	48.4	1.15	.98	26.1	28.3	.39	.54	1.2	.42	.86	1.03	1.15	1.67	12.7	.27	2580
D	10:32	1417.2	1417.5	1406.7	37.3	9.4	129	5880	15059	1866	48.2	1.15	.99	26.1	28.0	.39	.53	1.2	1.00	.86	1.03	1.15	1.67	13.0	.28	2530
D	10:35	1418.1	1418.0	1407.3	29.0	6.9	129	7770	17224	1886	47.2	1.15	1.01	26.1	27.6	.39	.43	1.2	1.00	.86	1.03	1.15	1.67	13.5	.32	2441
D	10:39	1419.1	1419.5	1407.6	8.4	9.8	128	7350	16945	1975	46.0	1.15	1.03	26.3	28.3	.39	.42	1.2	1.42	.86	1.03	1.15	1.67	13.8	.39	2582
D	10:47	1420.2	1420.5	1408.2	14.8	11.1	123	6930	12617	1992	50.2	1.15	1.03	26.4	27.7	.40	.42	1.2	1.35	.86	1.03	1.15	1.67	14.0	.53	2454
D	10:49	1421.2	1421.6	1408.2	39.9	8.7	119	7140	14462	1987	50.2	1.15	1.03	26.3	27.6	.40	.42	2.5	1.01	.86	1.03	1.15	1.67	15.1	.56	2294
D	10:58	1422.1	1420.6	1409.4	4.1	11.1	127	7140	9240	2063	48.8	1.15	1.17	26.3	27.6	.40	.41	1.2	1.67	.86	1.03	1.15	1.67	16.0	.70	2212
T	11:10	1422.6	1421.1	1419.8	----	----	31	1470	9277	465	50.0	1.15	1.20	26.2	27.2	.39	.39	2.5	----	----	----	----	----	----	----	----
D	11:36	1423.2	1421.6	1422.2	2.6	10.4	107	2940	13810	2197	39.7	1.15	1.17	26.4	29.4	.39	.41	1.2	1.71	.86	1.03	1.15	1.67	17.0	1.03	2186
T	11:56	1424.0	1422.1	1422.5	----	----	103	2940	10614	1836	43.2	1.15	1.16	27.5	29.0	.40	.42	2.5	----	----	----	----	----	----	----	----
D	11:58	1424.1	1422.6	1422.5	3.8	10.3	106	2940	11514	1853	43.4	1.15	1.16	27.5	28.9	.40	.40	1.2	1.63	.86	1.03	1.15	1.67	18.0	1.34	2172
T	12:18	1424.8	1423.1	1423.1	----	----	0	.000	8534	1563	40.0	1.15	1.17	27.5	29.0	.42	.39	1.2	----	----	----	----	----	----	----	----
D	12:18	1425.1	1423.1	1423.4	5.3	2.0	106	1890	11359	1941	47.4	1.15	1.17	27.5	29.3	.42	.41	1.2	1.51	.86	1.03	1.15	1.67	18.5	1.55	2144
D	12:24	1426.1	1424.1	1423.9	23.9	8.1	122	3360	11762	2214	45.8	1.15	1.16	27.5	30.2	.41	.40	1.2	1.87	.86	1.03	1.15	1.67	19.5	1.65	2073
D	12:39	1427.1	1425.6	1424.6	5.2	8.2	125	3360	13500	2568	49.0	1.15	1.16	27.8	29.8	.40	.42	2.5	1.50	.86	1.03	1.15	1.67	21.0	1.90	2018
D	12:51	1428.1	1426.6	1426.5	6.5	9.2	120	3150	14959	2637	54.6	1.15	1.16	27.7	29.9	.38	.42	2.5	1.42	.86	1.03	1.15	1.67	22.0	2.10	1970
D	12:56	1429.1	1427.2	1426.5	6.8	7.6	124	3150	15207	2619	54.6	1.15	1.16	27.8	29.9	.38	.42	1.2	1.47	.86	1.03	1.15	1.67	22.6	2.17	1946
D	13: 8	1430.2	1428.6	1427.1	5.8	9.4	122	3150	16479	1728	54.6	1.15	1.17	28.1	29.7	.38	.43	1.2	1.45	.86	1.03	1.15	1.67	24.0	2.29	1857
D	13:28	1431.2	1429.6	1428.6	3.5	10.9	122	3150	16262	1728	55.0	1.15	1.16	28.4	30.4	.39	.43	1.2	1.67	.86	1.03	1.15	1.67	25.0	2.61	1855
D	13:44	1432.2	1430.7	1430.1	4.7	10.1	122	3360	16510	1745	56.4	1.15	1.16	28.7	30.8	.39	.41	1.2	1.59	.86	1.03	1.15	1.67	26.1	2.82	1831
D	14: 0	1433.1	1431.6	1431.0	4.6	10.2	121	3150	16448	1745	56.2	1.15	1.16	28.9	30.6	.39	.43	2.5	1.58	.86	1.03	1.15	1.67	27.0	3.09	1827
D	14:14	1434.1	1432.6	1432.0	3.8	10.9	121	3150	16541	1745	57.0	1.15	1.18	29.0	30.9	.39	.43	1.2	1.66	.86	1.03	1.15	1.67	28.0	3.32	1808
D	14:31	1435.1	1433.6	1432.6	6.7	9.3	119	1890	16169	1780	56.6	1.15	1.17	29.1	31.5	.40	.43	1.2	1.43	.86	1.03	1.15	1.67	29.0	3.48	1779
D	14:40	1436.4	1434.8	1433.5	9.2	9.0	122	1890	17038	1745	58.2	1.15	1.17	29.3	31.3	.39	.44	1.2	1.42	.86	1.03	1.15	1.67	30.2	3.64	1740
D	14:42	1437.1	1435.1	1433.5	162.	8.6	122	1890	17193	1745	58.4	1.15	1.16	29.3	31.4	.39	.43	1.2	1.18	.86	1.03	1.15	1.67	31.1	3.68	1697
D	14:43	1438.2	1436.6	1433.5	98.4	7.6	121	1470	17224	1745	58.4	1.15	1.17	29.3	31.3	.39	.43	1.2	.73	.86	1.03	1.15	1.67	32.0	3.69	1650
D	14:48	1439.3	1437.6	1433.8	45.8	9.4	117	2100	17038	1730	58.6	1.15	1.17	29.4	31.4	.39	.45	2.5	.98	.86	1.03	1.15	1.67	33.0	3.73	1608
D	14:53	1440.2	1438.6	1434.1	11.4	7.2	111	4830	17069	1745	59.4	1.15	1.17	29.4	31.4	.39	.43	1.2	1.25	.86	1.03	1.15	1.68	34.0	3.81	1575
D	14:58	1441.1	1439.6	1434.4	12.1	8.6	113	5040	17162	1763	59.0	1.15	1.17	29.5	31.5	.39	.43	1.2	1.26	.86	1.03	1.15	1.68	35.0	3.89	1542
D	15:10	1442.1	1440.6	1435.6	4.8	9.4	113	4620	16778	1740	60.6	1.15	1.17	29.5	31.2	.39	.44	1.2	1.55	.86	1.03	1.15	1.68	36.0	4.08	1530
D	15:27	1443.1	1441.6	1440.5	3.7	8.2	117	4410	16852	1761	61.2	1.15	1.18	29.7	31.1	.39	.45	1.2	1.49	.86	1.03	1.15	1.68	37.0	4.36	1534
T	15:47	1444.0	1442.1	1442.3	----	----	116	4410	16666	1756	61.4	1.15	1.16	29.8	31.3	.40	.44	1.2	----	----	----	----	----	----	----	----
D	15:50	1444.1	1442.6	1442.3	3.4	9.0	109	4200	16634	1766	61.4	1.15	1.16	29.9	31.5	.40	.44	1.2	1.58	.86	1.03	1.15	1.68	38.0	4.76	1545
T	16:11	1444.8	1443.1	1443.2	----	----	106	2730	14820	1597	62.6	1.15	1.17	29.8	31.4	.39	.44	1.2	----	----	----	----	----	----	----	----
D	16:16	1445.1	1443.6	1443.5	3.1	8.7	103	2940	13740	2276	62.6	1.15	1.17	29.9	31.7	.40	.44	1.2	1.56	.86	1.03	1.15	1.68	39.0	5.09	1562
D	16:32	1446.1	1444.6	1444.1	5.3	7.9	121	3360	17097	1939	63.4	1.15	1.17	30.1	31.8	.39	.45	1.2	1.44	.86	1.03	1.15	1.68	40.8	5.31	1554
D	16:48	1447.1	1445.7	1444.5	9.1	8.3	122	3360	16510	1853	63.8	1.15	1.16	30.1	31.7	.39	.45	1.2	1.33	.86	1.03	1.15	1.68	41.1	5.44	1535
D	16:43	1448.1	1446.6	1444.8	29.8	8.4	122	3570	17069	1838	64.8	1.15	1.16	30.2	31.6	.39	.45	1.2	1.83	.86	1.03	1.15	1.68	42.1	5.49	1585
D	16:46	1449.1	1447.2	1445.1	21.4	7.6	122	3360	17038	1848	64.2	1.15	1.16	30.2	31.5	.39	.44	1.2	1.89	.86	1.03	1.15	1.68	42.6	5.53	1489
D	16:48	1450.1	1448.6	1445.1	18.4	8.4	116	5670	17100	1848	64.2	1.15	1.16	30.3	31.5	.39	.43	1.2	1.13	.86	1.03	1.15	1.68	44.0	5.57	1451

GEOSERVICES — HAMMERHEAD #1 — DATE : 10/ 6/82

ON-LINE TDC

BIT#15 RUN#3B REED HSS1 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 10 YP = 18 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	DRILLING PARAMETERS ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohm		unit			sg	sg	sg	met	DHr	$/m
D	16:51	1451.1	1449.6	1445.1	24.0	6.5	117	5250	17224	1840	64.6	1.15	1.16	30.2	31.7	.39	.44	1.2	1.00	.86	1.03	1.15	1.68	45.0	5.63	1425
D	16:54	1452.1	1450.6	1445.4	24.6	8.1	116	5460	16914	1866	64.6	1.15	1.16	30.4	31.9	.39	.44	1.2	1.05	.86	1.03	1.15	1.68	46.1	5.67	1398
D	16:58	1453.1	1451.6	1445.7	17.3	7.3	116	5460	16945	1866	64.6	1.15	1.16	30.3	32.0	.39	.44	1.2	1.13	.86	1.03	1.15	1.68	47.0	5.73	1378
D	17: 9	1454.2	1452.6	1446.3	10.0	8.6	119	2940	16541	1848	62.6	1.15	1.16	30.3	32.0	.40	.45	1.2	1.16	.86	1.03	1.15	1.68	48.0	5.80	1356
D	17:12	1455.1	1453.6	1446.6	21.1	9.2	115	5460	16876	1860	65.4	1.15	1.16	30.5	32.2	.40	.44	1.2	1.09	.86	1.03	1.15	1.68	49.0	5.86	1336
D	17:16	1456.2	1454.6	1447.8	15.3	9.1	117	5250	15797	1868	66.0	1.15	1.16	30.4	31.9	.41	.44	.0	1.19	.86	1.03	1.15	1.68	50.0	5.92	1317
D	17:19	1457.2	1455.6	1449.0	15.4	9.4	116	5670	15238	1848	66.2	1.15	1.17	30.4	32.0	.41	.44	.0	1.20	.86	1.03	1.15	1.68	51.0	5.97	1296
D	17:25	1458.2	1456.6	1450.9	11.4	6.6	118	5460	14990	1868	66.4	1.15	1.17	30.5	32.3	.41	.44	.0	1.24	.86	1.03	1.15	1.68	52.0	6.06	1279
D	17:28	1459.2	1457.6	1452.1	15.7	9.0	116	5460	14772	1848	66.4	1.15	1.17	30.5	32.3	.41	.44	1.2	1.17	.86	1.03	1.15	1.68	53.1	6.11	1262
D	17:31	1460.2	1458.6	1452.7	16.8	10.4	117	5460	14462	1868	66.8	1.15	1.17	30.5	32.0	.41	.45	1.2	1.17	.86	1.03	1.15	1.68	54.0	6.17	1245
D	17:34	1461.1	1459.2	1453.8	23.5	8.8	116	5460	14245	1848	64.6	1.15	1.17	30.6	31.9	.41	.44	1.2	1.11	.86	1.03	1.15	1.68	54.6	6.21	1235
D	17:43	1462.1	1460.6	1454.5	17.2	5.7	93	1090	14834	1858	62.8	1.15	1.16	30.6	31.9	.41	.43	1.2	1.12	.86	1.03	1.15	1.68	56.1	6.26	1211
D	17:46	1463.2	1461.6	1455.4	17.5	9.7	118	3360	16876	1921	62.8	1.15	1.16	30.5	32.6	.41	.44	1.2	1.19	.86	1.03	1.15	1.68	57.0	6.31	1195
D	17:50	1464.2	1462.6	1456.3	20.7	10.1	120	3360	16107	1906	64.0	1.15	1.20	30.6	32.5	.41	.44	1.2	1.17	.86	1.03	1.15	1.68	58.1	6.37	1179
D	17:52	1465.1	1463.6	1457.3	20.3	10.5	118	3360	15020	1886	64.4	1.15	1.16	30.5	32.1	.41	.44	1.2	1.16	.86	1.03	1.15	1.68	59.0	6.41	1164
D	17:56	1466.1	1464.1	1457.9	17.9	8.7	110	3360	15579	1906	64.0	1.15	1.16	30.6	32.2	.41	.45	1.2	1.21	.86	1.03	1.15	1.68	59.5	6.47	1157
D	17:59	1467.2	1465.6	1458.8	15.7	10.8	117	3360	15734	1906	64.0	1.15	1.16	30.7	32.4	.41	.45	1.2	1.24	.86	1.03	1.15	1.68	61.0	6.53	1137
D	18: 4	1468.1	1466.6	1460.3	16.8	9.7	118	3360	15455	1906	63.8	1.15	1.16	30.7	32.1	.41	.45	1.2	1.23	.86	1.03	1.15	1.68	62.0	6.60	1126
D	18: 8	1469.1	1467.6	1461.8	14.3	10.0	118	3360	16479	1960	62.6	1.15	1.16	30.7	32.0	.41	.46	1.2	1.20	.86	1.03	1.15	1.68	63.0	6.67	1114
D	18:12	1470.2	1468.6	1461.8	21.6	9.8	117	3360	16510	1939	62.4	1.15	1.71	30.8	32.2	.41	.46	1.2	1.16	.86	1.03	1.15	1.68	64.0	6.73	1102
D	18:20	1471.2	1469.6	1463.7	23.5	9.1	112	3360	16440	1957	61.0	1.20	1.20	30.7	31.9	.41	.46	1.2	1.05	.86	1.03	1.20	1.68	65.1	6.77	1089
D	18:24	1472.1	1470.7	1465.2	14.5	8.3	115	2940	17131	1957	61.2	1.20	1.21	30.7	32.5	.41	.44	1.2	1.16	.86	1.03	1.20	1.68	66.1	6.84	1077
D	18:27	1473.1	1471.1	1465.8	22.3	9.2	116	3150	16883	1977	61.0	1.20	1.20	30.7	32.2	.41	.45	1.2	1.06	.86	1.03	1.20	1.68	66.5	6.88	1072
D	18:30	1474.1	1472.7	1466.7	18.6	9.2	116	3150	16759	1972	60.8	1.20	1.21	30.8	32.2	.42	.45	1.2	1.10	.86	1.03	1.20	1.68	68.1	6.94	1054
D	18:33	1475.2	1473.6	1467.6	17.1	9.6	114	3150	16728	1957	60.6	1.20	1.20	30.8	32.7	.42	.45	1.2	1.16	.86	1.03	1.20	1.68	69.0	6.99	1044
D	18:36	1476.2	1474.6	1468.2	16.0	9.6	118	3570	16510	1977	60.2	1.20	1.20	30.8	32.8	.42	.45	1.2	1.14	.86	1.03	1.20	1.68	70.0	7.04	1034
D	18:40	1477.2	1475.6	1469.1	15.0	8.2	117	3360	16479	1957	60.0	1.20	1.20	30.8	32.8	.42	.46	1.2	1.15	.86	1.03	1.20	1.68	71.0	7.10	1024
D	18:43	1478.1	1476.6	1470.1	17.1	9.8	117	3150	16666	1977	60.0	1.20	1.20	30.9	32.8	.42	.46	1.2	1.15	.86	1.03	1.20	1.68	72.0	7.15	1014
D	18:47	1479.2	1477.6	1470.4	12.4	8.8	117	3150	16876	1977	59.6	1.20	1.20	30.9	32.8	.42	.45	1.2	1.20	.86	1.03	1.20	1.68	73.0	7.22	1006
D	18:59	1480.1	1478.6	1473.7	15.5	9.8	112	1890	16666	1941	58.6	1.20	1.19	31.1	33.8	.41	.45	1.2	1.17	.86	1.03	1.20	1.68	74.0	7.29	997
D	19: 2	1481.1	1479.6	1474.6	18.8	9.9	112	2940	17038	1939	58.2	1.20	1.20	31.1	33.5	.41	.47	.0	1.15	.86	1.03	1.20	1.68	75.0	7.34	988
D	19: 6	1482.2	1480.6	1475.5	11.6	8.6	111	2940	17069	1939	59.2	1.20	1.20	31.1	33.7	.41	.45	1.2	1.23	.86	1.03	1.20	1.68	76.0	7.40	980
D	19:11	1483.2	1481.5	1476.8	12.2	9.8	112	3150	17076	1967	58.8	1.20	1.20	31.1	33.4	.41	.46	.0	1.23	.86	1.03	1.20	1.68	77.0	7.47	973
D	19:15	1484.1	1482.6	1478.3	11.1	9.3	112	3150	16324	1901	58.4	1.20	1.20	31.1	33.3	.40	.45	.0	1.26	.86	1.03	1.20	1.68	78.0	7.55	966
D	19:20	1485.2	1483.7	1479.2	13.9	10.2	112	3150	16821	1703	58.4	1.20	1.20	31.2	33.5	.40	.45	.0	1.21	.86	1.03	1.20	1.68	79.1	7.63	959
D	19:24	1486.2	1484.6	1479.5	12.7	9.2	116	3150	16697	1903	58.2	1.20	1.20	31.3	33.1	.40	.46	1.2	1.23	.86	1.03	1.20	1.68	80.0	7.70	953
D	19:29	1487.2	1485.6	1480.1	13.8	9.5	116	3150	14070	1924	58.4	1.20	1.20	31.3	33.1	.40	.46	1.2	1.21	.86	1.03	1.20	1.68	81.0	7.76	946
D	19:34	1488.1	1486.5	1481.3	11.7	8.9	118	3150	11079	1868	58.4	1.20	1.20	31.5	33.0	.40	.45	1.2	1.24	.86	1.03	1.20	1.69	82.0	7.86	941
D	19:45	1489.1	1487.6	1483.2	20.0	9.8	113	3150	17038	1886	57.6	1.20	1.20	31.3	33.0	.40	.46	1.2	1.06	.86	1.03	1.20	1.69	83.0	7.93	934
D	19:48	1490.2	1488.6	1484.1	18.5	8.8	113	2940	17069	1903	57.8	1.20	1.20	31.4	33.6	.40	.45	1.2	1.11	.86	1.03	1.20	1.69	84.0	7.99	927
D	19:52	1491.2	1489.5	1484.7	15.1	9.2	118	3150	16834	1886	57.8	1.20	1.20	31.4	33.7	.40	.46	1.2	1.17	.86	1.03	1.20	1.69	85.0	8.04	920
D	19:56	1492.2	1490.6	1485.6	15.8	8.3	110	3150	16720	1886	57.6	1.20	1.20	31.5	33.9	.40	.45	1.2	1.15	.86	1.03	1.20	1.69	86.0	8.11	914
D	19:59	1493.1	1491.6	1486.5	18.7	8.6	120	3150	16728	1906	57.4	1.20	1.20	31.5	34.1	.40	.46	1.2	1.13	.86	1.03	1.20	1.69	87.0	8.17	907
D	20: 9	1494.1	1492.6	1488.3	4.8	10.5	123	3360	16852	1886	56.8	1.20	1.20	31.7	34.3	.40	.45	1.2	1.40	.86	1.03	1.20	1.69	88.0	8.33	907
D	20:29	1495.2	1493.6	1492.9	3.5	10.8	119	3150	16945	1866	56.6	1.20	1.21	32.2	34.5	.39	.44	1.2	1.61	.86	1.03	1.20	1.69	89.0	8.66	918
D	20:41	1496.1	1494.6	1494.1	5.6	10.5	119	3360	17038	1866	55.8	1.20	1.20	32.4	34.7	.39	.45	1.2	1.45	.86	1.03	1.20	1.69	90.0	8.86	921
T	21: 1	1497.0	1495.8	1495.8	——	——	119	2940	17131	1886	55.4	1.20	1.21	32.9	35.3	.39	.45	1.2	——	——	——	——	——	——	——	——
D	21: 4	1497.1	1495.6	1495.4	2.3	11.5	118	3150	17069	1886	55.2	1.20	1.20	33.0	35.3	.39	.45	1.2	1.71	.86	1.03	1.20	1.69	91.0	9.24	934
T	21:24	1498.0	1496.1	1496.6	——	——	20	2520	16634	1812	54.8	1.20	1.21	33.1	35.6	.39	.45	.0	——	——	——	——	——	——	——	——

GEOSERVICES — HAMMERHEAD #1 — DATE : 10/ 6/82

ON-LINE TDC

BIT#15 RUN#38 REED HSS1 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 10 YP = 10 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	DRILLING PARAMETERS ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	21:24	1498.3	1496.8	1496.6	150.	8.3	89	1890	16976	1830	54.9	1.20	1.21	33.1	35.6	.39	.45	-1.2	.49	.86	1.62	1.20	1.95	92.2	9.43	936
T	21:44	1498.9	1497.1	1497.2	----	----	116	3150	15797	1919	53.6	1.20	1.20	33.6	36.6	.40	.44	1.2								
D	21:46	1499.1	1497.5	1497.2	2.0	11.0	117	3360	16076	1866	53.4	1.20	1.21	33.7	36.8	.40	.43	2.5	1.72	.86	1.03	1.20	1.69	93.0	9.00	950
D	21:59	1500.1	1498.6	1498.4	4.1	11.4	110	3150	17783	1986	52.8	1.20	1.21	34.1	36.5	.40	.44	2.5	1.53	.86	1.03	1.20	1.69	94.0	10.02	954
D	22:16	1501.1	1499.6	1499.8	3.1	12.3	116	2730	17783	1923	53.0	1.20	1.20	34.5	36.9	.40	.43	1.2	1.65	.86	1.03	1.20	1.69	95.0	10.29	961
T	22:36	1502.0	1500.1	1500.5	----	----	110	2940	17690	1931	53.2	1.20	1.20	34.9	37.4	.40	.45	2.5								
D	22:41	1502.1	1500.5	1500.5	1.4	12.1	117	2940	17690	1903	53.0	1.20	1.21	35.0	37.4	.40	.45	3.7	1.85	.86	1.03	1.20	1.69	96.0	10.70	974
D	22:55	1503.1	1501.6	1501.8	3.8	11.5	117	3150	17845	1792	50.8	1.20	1.20	34.8	37.3	.40	.44	2.5	1.58	.86	1.03	1.20	1.69	97.0	10.93	980
T	23:15	1503.8	1502.1	1502.1	----	----	117	2520	17317	1810	50.4	1.20	1.20	35.2	37.0	.40	.46	2.5								
D	23:32	1504.1	1502.5	1503.3	1.7	11.4	115	2940	14640	1830	60.0	1.20	1.20	35.0	37.4	.41	.45	2.5	1.82	.86	1.03	1.20	1.69	98.0	11.55	1001
T	23:52	1504.7	1503.1	1503.9	----	----	116	2940	14617	1803	58.6	1.20	1.20	35.3	37.4	.41	.43	3.7								
D	23:58	1505.1	1503.6	1503.9	4.0	9.4	116	2940	14741	1810	58.4	1.20	1.19	35.4	35.8	.41	.43	3.7	1.54	.86	1.03	1.20	1.69	99.0	11.98	1021
D	0:11	1506.1	1504.6	1504.2	8.2	11.7	116	2940	14493	1792	57.8	1.20	1.19	35.2	37.6	.41	.45	1.2	1.35	.86	1.03	1.20	1.69	100.0	12.20	1024
D	0:14	1507.1	1505.2	1504.2	17.1	11.0	115	3150	14462	1795	57.8	1.20	1.19	35.2	37.7	.41	.45	3.7	1.17	.86	1.03	1.20	1.69	100.6	12.24	1019
D	0:27	1508.1	1506.6	1504.5	26.1	8.3	114	3360	13593	1734	56.8	1.20	1.20	35.1	37.1	.41	.45	5.0	1.05	.86	1.03	1.20	1.69	102.1	12.29	1009
D	0:39	1509.1	1507.6	1505.1	3.6	8.3	116	2940	15672	1889	57.2	1.20	1.19	35.1	37.1	.42	.45	2.5	1.47	.86	1.03	1.20	1.69	103.1	12.50	1011
D	1: 4	1511.1	1509.6	1508.5	7.0	10.4	115	2940	15424	1868	56.4	1.20	1.19	35.2	36.3	.42	.46	3.7	1.40	.86	1.03	1.20	1.69	105.0	12.90	1013
D	1: 5	1511.2	1509.6	1508.8	7.0	9.9	116	2940	15455	1866	56.4	1.20	1.19	35.1	36.3	.42	.46	3.7	1.40	.86	1.03	1.20	1.69	105.0	12.91	1013
D	1:22	1512.1	1510.5	1509.4	1.9	10.3	114	3150	15517	1886	55.6	1.20	1.19	35.0	36.2	.42	.46	2.5	1.72	.86	1.03	1.20	1.69	106.0	13.21	1020
T	1:42	1512.6	1511.1	1511.0	----	----	114	2940	15797	1868	55.4	1.20	1.19	34.8	36.0	.42	.46	3.7								
D	1:53	1513.1	1511.6	1512.1	1.9	9.6	116	2940	16541	1889	56.6	1.20	1.19	34.6	35.7	.41	.46	2.5	1.70	.86	1.03	1.20	1.69	107.0	13.73	1039
T	2:13	1513.8	1512.1	1512.4	----	----	116	3150	16479	1889	55.0	1.20	1.19	34.3	35.2	.41	.45	2.5								
D	2:18	1514.1	1512.6	1512.7	2.2	11.0	115	3150	16883	1889	55.0	1.20	1.19	34.1	35.0	.41	.45	3.7	1.69	.86	1.03	1.20	1.69	108.0	14.14	1053
D	2:34	1515.1	1513.0	1513.3	2.5	9.9	115	3150	16697	1889	55.4	1.20	1.19	34.0	35.3	.41	.46	3.7	1.64	.86	1.03	1.20	1.69	108.5	14.40	1059
D	2:35	1516.1	1514.5	1513.3	36.6	6.1	115	3150	16720	1866	55.4	1.20	1.19	34.0	35.2	.41	.46	3.7	.87	.86	1.03	1.20	1.69	110.0	14.42	1049
D	2:49	1517.1	1515.6	1513.6	22.0	10.3	110	3570	15610	1823	54.8	1.20	1.19	33.8	34.0	.41	.46	7.5	1.05	.86	1.03	1.20	1.69	111.0	14.46	1042
D	2:53	1518.2	1516.6	1513.6	17.6	8.6	120	3360	15455	1830	55.2	1.20	1.19	33.8	34.9	.41	.46	6.2	1.12	.86	1.03	1.20	1.69	112.1	14.52	1035
T	3:13	1518.9	1517.0	1514.6	----	----	118	2940	15230	1830	55.2	1.20	1.19	33.7	35.6	.41	.45	3.7								
D	3:25	1519.1	1517.5	1518.2	1.6	11.4	119	3150	15145	1828	55.4	1.20	1.19	33.7	35.3	.41	.46	3.7	1.83	.86	1.03	1.20	1.69	113.0	15.06	1050
T	3:45	1519.9	1518.0	1518.0	----	----	117	3150	15176	1828	54.8	1.20	1.19	33.7	35.4	.41	.46	3.7								
D	3:54	1520.1	1518.5	1518.8	2.1	11.3	117	2940	15362	1830	55.2	1.20	1.19	33.7	35.5	.41	.46	3.7	1.60	.86	1.03	1.20	1.69	114.0	15.54	1068
D	4: 5	1521.2	1519.0	1519.4	3.1	10.5	116	2940	15331	1858	54.8	1.20	1.19	33.8	35.4	.41	.46	5.0	1.59	.86	1.03	1.20	1.69	114.5	15.72	1072
D	4:18	1522.2	1520.5	1519.4	12.7	9.9	119	3150	15238	1850	54.6	1.20	1.19	33.8	35.3	.41	.47	3.7	1.24	.87	1.03	1.20	1.69	116.0	15.81	1065
D	4:22	1523.1	1521.5	1519.7	3.8	11.1	119	3150	15114	1830	54.6	1.20	1.19	33.8	35.4	.42	.46	3.7	1.56	.87	1.03	1.20	1.69	117.0	16.00	1064
T	4:42	1524.0	1522.1	1522.2	----	----	116	2940	15145	1868	54.0	1.20	1.19	33.8	35.4	.42	.46	3.7								
D	4:47	1524.1	1522.6	1522.8	2.0	10.4	116	2940	15021	1830	54.0	1.20	1.19	33.8	35.2	.42	.47	2.5	1.71	.87	1.03	1.20	1.69	118.0	16.42	1076
T	5: 7	1524.2	1522.6	1523.1	----	----	0	.000	-1459	0	54.4	1.20	1.22	33.6	35.2	.41	.42	8.7								

ON-LINE TDC
GEOSERVICES BIT REPORT

* 11/ 6/82 HAMMERHEAD #1

*BIT HEADING :BIT#15 RUN#30
*BIT TYPE :INSERT
*BIT IDENTITY :REED HSS1

*BIT SIZE : 8.50 INCH
*BIT COST : 8888. $ RIG COST/HR: 5833.

*NOZZLES : 11 11 11 /32NDS @ 95 % EFFICIENCY

*DEPTH IN : 1406.14 METERS 10/ 6/82
*DEPTH OUT : 1524.16 METERS 11/ 6/82
*METRAGE : 118.02 METERS
*TOTAL REVOLUTIONS : 115

*DRILLING TIME: 16:31 HR AVERAGE ROP: 7.15 M/HR
*TIME IN HOLE : 19: 1 HR AVERAGE ROP: 6.21 M/HR
*TRIP TIME : 4: 0 HR

*DRILLING COST STANDARD : 1285.4 $/MET
*DRILLING COST ON BOTTOM : 1881.7 $/MET
*DRILLING COST MINIMUM : 934.4 $/MET

* AVERAGE OVER THE RUN AVERAGE HYDRAULICS
*WEIGHT ON BIT : 9.35 TONS NOZZLES SPEED : 174.60 M/S
*ROTATION : 117.80 RPM PRESSURE DROP : 20241 KPA
*FLOW RATE :1880.43 L/MN HYDRAULIC POWER: 850.82 H.P
*STAND PIPE PRESSURE: 15974 KPA

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

11/ 6/82 TIME 5:14 HAMMERHEAD #1

DEPTH OF EXECUTION 1524.16 METERS
FLOW RATE 1900 L/MN POWER LAW

MUD DATA	WEIGHT	1.20 SG
	PV	18 CPS
	YP	29.00 LB/FT2
	GEL	2.00 LB/100 FT2
	N	.4054
	K	2.1001 LB/100 FT2
HOLES VOLUMES	WITH PIPES	64.76 M3
	WITHOUT PIPES	72.62 M3
	ANNULAR	51.79 M3
	INSIDE PIPES	12.97 M3

	FROM	TO	PIPE ID	PIPE OD	HOLE DIAM	P.LOSSES	H.P	TYPE	CRITICAL FLOW	MUD VELOCITY	CUTTINGS VELOCITY
	METERS		INCH	INCH	INCH	KPA			L/MN	M/MN	M/MN
SURF.EQPT						330	14				
DR.STRING	.00	1297.20	4.28	5.00		1729	73				
DR.STRING	1297.20	1352.90	3.00	5.00		487	17				
DR.STRING	1352.90	1526.24	2.81	6.50		1724	73				
BIT						20665	870	M/S		176.4	
ANNULUS	1524.16	1350.82	6.50	8.50		340	15	LA	2117.9	125.0	122.5
ANNULUS	1350.82	1295.12	5.00	8.50		40	2	LA	2788.0	79.4	77.8
ANNULUS	1295.12	1184.00	5.00	8.50		80	3	LA	2788.0	79.4	77.8
ANNULUS	1184.00	143.00	5.00	8.69		670	28	LA	2930.6	74.2	72.8
ANNULUS	143.00	.00	5.00	16.75		9	0	LA	10229.	14.7	14.1
TOTAL						26009	1105				

ANNULAR PRESSURE LOSSES 1146 KPA

EQUIV.CIRCULATING DENSITY 1.28 SG
MAX DEPTH 2579.06

MUD LAG TIMES	S -> B	6.82 MN
	B -> S	27.26 MN
CUTTINGS DATA	SIZE	.20 CM
	DENSITY	2.40 SG
	LAG TIME	28.00 MN
	MAX SLIP VELOCITY	2.45 M/MN
BIT DATA	SIZE	8.50 INCH
	NOZZLES	11 11 11 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	20665 KPA
	H.H.P RATIO	79.45 %
	BIT H.H.P	15.467
	BIT VELOCITY	176.41 M/S

GEOSERVICES — HAMMERHEAD #1 — DATE : 11/ 6/82

ON-LINE TDC

BIT#15 RUN#3B REED HSSI BIT DIAMETER : 8.50 inch NOZZ 11/11/11 MUD RHEOLOGICAL PARAMETERS : PV = 18 YP = 29 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm		KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	Hr	$/m
T	5:27	1524.2	1522.6	1523.1	----	----	0	.000	-1428	0	53.2	1.20	1.22	33.2	35.1	.41	.41	8.7								
T	5:47	1524.8	1523.0	1523.7	----	----	114	1600	16231	1941	50.6	1.20	1.19	32.9	35.1	.43	.45	2.5								
D	6: 0	1525.1	1523.5	1524.0	1.7	8.5	120	1890	15952	1926	50.4	1.20	1.19	33.0	35.5	.43	.46	3.7	1.61	.87	1.03	1.20	1.69	119.0	17.01	1894
T	6:20	1525.7	1524.1	1524.6	----	----	123	3150	15610	1931	49.8	1.20	1.19	33.3	35.7	.44	.46	5.0								
D	6:36	1526.1	1524.5	1525.2	1.7	12.7	129	3150	15952	1906	49.4	1.20	1.19	33.7	35.4	.43	.47	2.5	1.79	.87	1.03	1.20	1.69	120.0	17.60	1115
T	6:56	1526.8	1525.0	1525.5	----	----	131	3360	15734	1918	49.0	1.20	1.19	33.9	35.6	.44	.47	.0								
D	7: 0	1527.2	1525.6	1526.1	1.7	13.0	131	3360	15540	1941	48.6	1.20	1.19	33.9	35.5	.44	.47	-1.2	1.91	.87	1.03	1.20	1.69	121.0	18.14	1132
T	7:20	1527.6	1526.0	1526.7	----	----	133	3360	15145	1934	47.6	1.20	1.19	34.1	35.8	.44	.47	-1.2								
D	7:44	1528.1	1526.6	1527.1	1.9	12.1	132	3360	14640	1924	46.6	1.20	1.19	34.0	36.0	.45	.47	-2.5	1.86	.87	1.03	1.20	1.69	122.0	18.74	1151
T	8: 4	1528.5	1526.6	1527.4	----	----	0	.000	-1428	0	42.2	1.20	1.22	34.1	36.1	.42	.44	10.0								
D	8:23	1529.2	1527.5	1528.0	1.3	14.2	125	3150	16803	1889	42.0	1.20	1.19	34.2	36.2	.43	.46	-2.5	1.93	.87	1.03	1.20	1.69	123.0	19.25	1165
T	8:43	1529.7	1528.0	1528.6	----	----	124	3150	15579	1906	42.4	1.20	1.21	34.4	36.3	.43	.47	-1.2								
D	8:56	1530.1	1528.5	1529.2	1.9	11.0	122	2940	14959	1921	42.8	1.20	1.21	34.6	36.4	.43	.45	3.7	1.83	.87	1.03	1.20	1.69	124.0	19.80	1182
T	9:16	1531.0	1529.0	1529.8	----	----	125	3360	14617	1921	43.0	1.20	1.20	34.9	36.3	.43	.46	1.2								
D	9:18	1531.1	1529.5	1529.8	2.6	11.9	126	3150	14617	1921	42.6	1.20	1.20	34.8	36.4	.43	.46	.0	1.71	.87	1.03	1.20	1.69	125.0	20.16	1190
D	9:29	1532.1	1530.6	1530.1	29.9	13.5	126	3570	15393	1710	43.0	1.20	1.20	34.8	36.6	.43	.46	-1.2	1.87	.87	1.03	1.20	1.69	126.1	20.25	1185
D	9:31	1533.1	1531.6	1530.1	65.2	13.6	126	3150	15238	1728	43.0	1.20	1.19	34.8	36.3	.43	.46	-2.5	.92	.87	1.03	1.20	1.69	127.0	20.28	1178
D	9:40	1534.1	1532.1	1530.1	42.9	10.5	127	1890	15269	1810	42.6	1.20	1.20	34.7	36.4	.43	.47	5.0	1.81	.87	1.03	1.20	1.69	127.6	20.31	1173
D	9:42	1535.1	1533.6	1530.4	26.7	13.0	126	3780	14524	1673	42.6	1.20	1.19	34.7	36.4	.43	.46	.0	1.15	.87	1.03	1.20	1.69	129.1	20.34	1162
T	10: 2	1535.6	1534.0	1531.0	----	----	129	3780	15486	1728	41.8	1.20	1.19	34.4	35.9	.43	.47	-1.2								
D	10:13	1536.1	1534.5	1531.9	2.6	13.7	130	3360	14183	1728	41.8	1.20	1.20	34.4	35.8	.43	.46	-5.0	1.78	.87	1.03	1.20	1.70	130.0	20.58	1163
D	10:21	1537.2	1535.6	1534.1	7.5	13.8	129	3780	13345	1728	42.4	1.20	1.20	34.2	35.5	.46	.47	-2.5	1.54	.87	1.03	1.20	1.70	131.0	20.71	1161
D	10:26	1538.1	1536.6	1535.3	8.3	12.9	61	2100	4120	1253	42.2	1.20	1.22	34.3	35.3	.44	.45	5.0	1.37	.87	1.03	1.20	1.70	132.1	20.79	1155
D	10:29	1539.1	1537.5	1535.6	33.9	12.5	123	2310	14369	1655	41.8	1.20	1.20	34.3	34.9	.44	.46	5.0	1.85	.87	1.03	1.20	1.70	133.0	20.84	1149
D	10:38	1540.1	1538.5	1535.6	3.7	14.9	123	3360	15703	1693	42.6	1.20	1.20	34.2	34.4	.44	.47	-6.2	1.74	.87	1.03	1.20	1.70	134.0	21.00	1147
D	10:52	1541.2	1539.6	1536.5	8.3	13.6	127	3570	14121	1921	45.4	1.20	1.20	34.0	34.3	.45	.47	.0	1.49	.87	1.03	1.20	1.70	135.1	21.22	1148
D	10:56	1542.1	1540.0	1537.4	8.0	12.6	125	3990	13252	1921	45.8	1.20	1.20	33.7	34.3	.45	.47	-1.2	1.50	.87	1.03	1.20	1.70	135.5	21.29	1147
D	10:59	1543.1	1541.0	1538.3	27.0	13.4	125	3570	13159	1921	45.6	1.20	1.20	33.7	34.2	.45	.46	-1.2	1.16	.87	1.03	1.20	1.70	136.5	21.34	1140
D	11: 1	1544.1	1542.5	1539.2	29.4	11.8	126	3570	12840	1939	46.6	1.20	1.20	33.7	34.1	.45	.47	-1.2	1.10	.87	1.03	1.20	1.70	138.0	21.39	1131
D	11: 3	1545.2	1543.0	1539.5	25.8	12.4	127	3360	13314	1939	46.4	1.20	1.20	33.4	34.1	.45	.40	1.2	1.12	.87	1.03	1.20	1.70	138.5	21.40	1127
T	11:23	1545.7	1544.1	1541.1	----	----	49	1470	13252	1921	48.4	1.20	1.19	33.4	37.0	.45	.45	5.0								
T	11:43	1545.7	1544.1	1545.6	----	----	0	.000	13500	1886	48.2	1.20	1.19	33.8	38.0	.45	.47	1.2								
T	12: 3	1545.7	1544.1	1545.6	----	----	47	1470	-155	1636	47.8	1.20	1.21	34.7	37.1	.44	.44	7.5								
D	12:11	1546.2	1544.6	1545.6	10.0	11.9	125	3150	14307	2582	47.2	1.20	1.20	34.7	35.4	.44	.47	-3.7	1.23	.87	1.03	1.20	1.70	140.0	21.47	1117
D	12:24	1547.2	1545.5	1545.6	4.3	11.4	125	3360	12476	2638	50.2	1.20	1.20	35.5	34.4	.44	.46	1.2	1.59	.87	1.03	1.20	1.70	141.0	21.67	1119
D	12:41	1548.1	1546.6	1546.3	6.1	11.8	120	3360	13003	2439	49.2	1.20	1.20	33.8	34.4	.44	.46	1.2	1.47	.87	1.03	1.20	1.70	142.1	21.84	1117
D	13: 0	1549.2	1547.5	1547.8	2.2	12.6	122	3150	12352	2477	52.2	1.20	1.20	33.3	33.7	.43	.45	5.0	1.77	.87	1.03	1.20	1.70	143.0	22.17	1123
D	13: 4	1550.2	1548.5	1548.1	16.8	9.0	126	3150	12352	2485	52.4	1.20	1.20	33.1	33.8	.44	.45	7.5	1.18	.87	1.03	1.20	1.70	144.0	22.23	1118
D	13: 6	1551.2	1549.0	1548.1	28.4	10.0	120	3360	12290	2477	52.6	1.20	1.20	33.1	33.8	.44	.45	8.7	1.08	.87	1.03	1.20	1.70	144.5	22.27	1115
D	13:14	1552.3	1550.1	1548.4	23.0	.0	0	.000	-1366	0	55.2	1.20	1.22	33.0	33.7	.43	.44	15.0	1.10	.87	1.03	1.20	1.70	145.6	22.32	1108
D	13:16	1553.4	1551.7	1548.4	318.	2.0	99	1890	11141	2422	55.0	1.20	1.21	32.9	33.6	.43	.44	17.5	.23	.87	1.03	1.20	1.70	147.1	22.33	1098
D	13:16	1554.3	1552.6	1548.4	200.	3.7	116	2100	11328	2457	55.0	1.20	1.21	33.0	33.6	.43	.44	17.5	.38	.87	1.03	1.20	1.70	148.1	22.33	1091
D	13:19	1555.2	1553.6	1548.7	15.0	11.3	128	3780	11824	2447	57.0	1.20	1.20	32.8	34.1	.43	.44	10.0	1.20	.87	1.03	1.20	1.70	149.1	22.38	1086
D	13:24	1556.1	1554.6	1548.7	7.6	10.6	127	3780	11638	2457	59.2	1.20	1.21	32.8	33.7	.43	.46	11.3	1.43	.87	1.03	1.20	1.70	150.0	22.47	1082
D	13:31	1557.2	1555.6	1550.2	7.4	10.1	126	3780	11483	2442	59.6	1.20	1.20	32.5	33.4	.44	.46	3.7	1.41	.87	1.03	1.20	1.70	151.0	22.58	1079
D	13:38	1558.1	1556.6	1551.7	18.3	10.9	132	3780	11266	2462	59.6	1.20	1.20	31.9	33.3	.43	.45	6.2	1.34	.87	1.03	1.20	1.70	152.1	22.69	1076
D	13:43	1559.1	1557.6	1555.1	10.2	10.0	131	3780	11110	2488	59.8	1.20	1.20	31.6	33.3	.43	.45	7.5	1.35	.87	1.03	1.20	1.70	153.1	22.78	1073
D	13:49	1560.1	1558.5	1556.3	12.2	10.3	144	3570	10955	2475	60.0	1.20	1.20	31.6	32.8	.43	.45	11.3	1.30	.87	1.03	1.20	1.70	154.0	22.87	1069
D	13:54	1561.2	1559.6	1556.9	11.9	11.0	130	3570	10986	2470	60.2	1.20	1.19	32.1	32.5	.43	.45	8.7	1.33	.87	1.03	1.20	1.70	155.1	22.97	1066

GEOSERVICES — HAMMERHEAD #1 — DATE : 11/ 6/82

ON-LINE TDC

BIT#15 RUN#30 REED HSS1 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 18 YP = 29 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	Nm	KPA	l/mn	m3	sg		degC		ohm		unit			sg	sg	sg	met	DHr	$/m
D	14: 2	1562.2	1560.5	1558.1	7.2	12.5	131	3570	10062	2490	60.2	1.20	1.20	32.1	32.2	.44	.45	7.5	1.46	.87	1.03	1.20	1.70	156.0	23.09	1064
D	14: 5	1563.2	1561.6	1558.8	18.7	10.8	120	3780	10769	2508	60.4	1.20	1.20	32.1	32.2	.44	.45	6.2	1.16	.87	1.03	1.20	1.70	157.0	23.14	1059
T	14:25	1563.6	1562.1	1561.2	——	——	31	1260	10055	2452	60.4	1.20	1.19	31.7	34.6	.44	.45	8.7	——	——	——	——	——	——	——	——
T	14:45	1563.6	1562.1	1563.6	——	——	5	1260	10179	2490	60.2	1.20	1.19	31.8	36.2	.44	.44	7.5	——	——	——	——	——	——	——	——
D	14:58	1564.1	1562.5	1563.6	13.1	10.4	127	3780	9962	2696	59.8	1.20	1.20	32.4	36.2	.44	.44	8.7	1.20	.87	1.03	1.20	1.70	158.0	23.21	1055
D	15:11	1565.1	1563.5	1563.6	14.2	10.8	119	2730	11421	2543	58.8	1.20	1.20	34.2	34.8	.44	.46	11.3	1.18	.87	1.03	1.20	1.70	159.0	23.31	1052
D	15:17	1566.1	1564.5	1563.6	7.8	11.5	121	3780	9683	2920	58.2	1.20	1.20	34.3	34.3	.44	.44	6.2	1.39	.87	1.03	1.20	1.70	160.0	23.40	1049
D	15:23	1567.2	1565.5	1564.5	10.3	10.6	127	3990	9038	2971	57.6	1.20	1.20	34.1	33.6	.44	.45	5.0	1.33	.87	1.03	1.20	1.70	161.0	23.51	1046
D	15:29	1568.1	1566.5	1564.8	8.4	10.5	126	3570	8235	3089	57.4	1.20	1.20	33.5	33.5	.44	.45	2.5	1.37	.87	1.03	1.20	1.70	162.0	23.60	1043
D	15:35	1569.1	1567.5	1565.8	10.2	10.6	124	3780	9683	2999	57.0	1.20	1.20	33.2	33.0	.44	.45	2.5	1.31	.87	1.03	1.20	1.70	163.0	23.71	1040
D	15:47	1570.2	1568.5	1567.3	11.5	9.5	121	3570	14121	1891	54.6	1.20	1.20	33.1	33.2	.43	.46	.0	1.27	.87	1.03	1.20	1.70	164.0	23.82	1038
D	15:54	1571.1	1569.6	1567.9	7.9	11.6	117	3360	12786	1871	54.6	1.20	1.20	32.5	33.7	.43	.45	1.2	1.39	.87	1.03	1.20	1.70	165.1	23.93	1035
T	16:14	1571.6	1570.0	1569.7	——	——	117	3150	13810	2257	53.4	1.20	1.20	32.6	34.0	.44	.45	5.0	——	——	——	——	——	——	——	——
T	16:34	1571.9	1570.0	1571.2	——	——	119	3150	12321	1757	52.2	1.20	1.20	32.7	33.7	.44	.45	6.2	——	——	——	——	——	——	——	——
D	16:47	1572.2	1570.6	1571.6	1.3	12.2	120	3150	12103	1774	51.2	1.20	1.20	32.8	33.0	.44	.45	2.5	1.98	.87	1.03	1.20	1.70	166.1	24.76	1056
D	17: 3	1573.2	1571.6	1571.6	13.4	11.3	122	3570	12079	1757	50.0	1.20	1.19	32.5	33.4	.44	.45	16.2	1.26	.87	1.03	1.20	1.70	167.1	24.89	1056
D	17: 7	1574.1	1572.5	1571.6	14.4	11.8	122	3360	12220	1774	49.4	1.20	1.20	32.8	33.5	.44	.45	2.5	1.24	.87	1.03	1.20	1.70	168.0	24.96	1053
D	17:13	1575.1	1573.5	1571.9	8.5	11.7	119	3570	13221	1774	49.2	1.20	1.22	32.5	33.6	.44	.46	1.2	1.41	.87	1.03	1.20	1.70	169.0	25.06	1050
D	17:21	1576.1	1574.1	1571.9	11.5	12.2	120	3780	13469	1632	47.4	1.20	1.20	32.4	33.7	.44	.45	20.0	1.33	.87	1.03	1.20	1.70	169.6	25.15	1048
D	17:28	1577.2	1575.6	1572.2	10.8	12.6	120	3990	11855	1774	47.4	1.20	1.20	32.4	33.1	.44	.46	6.2	1.35	.87	1.03	1.20	1.70	171.1	25.26	1044
D	17:34	1578.2	1576.5	1572.8	10.1	11.5	123	3780	13779	1777	47.8	1.20	1.20	32.4	33.4	.44	.46	5.0	1.36	.87	1.03	1.20	1.70	172.0	25.36	1042
D	17:38	1579.1	1577.6	1573.4	11.8	12.8	121	3990	12476	1774	46.8	1.20	1.20	32.4	33.3	.44	.46	2.5	1.31	.87	1.03	1.20	1.70	173.0	25.43	1038
D	17:42	1580.1	1578.6	1574.3	23.9	11.4	123	4620	10986	1786	45.4	1.20	1.22	32.5	33.5	.43	.47	7.5	1.13	.87	1.03	1.20	1.70	174.1	25.50	1034
D	17:46	1581.2	1579.6	1574.9	18.7	12.0	121	3990	10707	1791	45.4	1.20	1.20	32.6	33.7	.43	.46	2.5	1.20	.87	1.03	1.20	1.70	175.0	25.55	1030
D	17:58	1582.1	1580.0	1576.1	19.8	13.3	111	2520	13190	1811	44.4	1.20	1.20	32.4	33.4	.43	.47	17.5	1.20	.87	1.03	1.20	1.70	175.5	25.61	1028
D	18:16	1583.2	1581.6	1578.6	10.7	12.3	111	2310	14462	1774	41.8	1.20	1.20	32.1	33.1	.42	.45	12.5	1.29	.87	1.03	1.20	1.70	177.1	25.71	1023
D	18:19	1584.2	1582.6	1579.2	18.8	11.4	111	2730	14493	1755	40.8	1.20	1.21	32.1	32.7	.42	.45	7.5	1.19	.87	1.03	1.20	1.70	178.1	25.76	1020
D	18:23	1585.1	1583.1	1580.1	18.6	12.2	117	3360	14400	1774	40.3	1.20	1.20	32.4	33.3	.41	.45	6.2	1.20	.87	1.03	1.20	1.71	179.1	25.82	1016
D	18:27	1586.2	1584.5	1581.3	12.5	13.2	116	3780	15540	1772	40.1	1.20	1.20	32.0	34.2	.40	.45	1.2	1.32	.87	1.03	1.20	1.71	180.0	25.90	1013
D	18:31	1587.1	1585.5	1581.9	14.8	11.2	118	3570	13407	1777	40.1	1.20	1.20	32.0	34.3	.39	.45	3.7	1.25	.87	1.03	1.20	1.71	181.0	25.96	1010
D	18:37	1588.2	1586.5	1582.2	13.3	12.6	117	3990	13717	1794	40.3	1.20	1.20	32.1	34.2	.37	.46	5.0	1.30	.87	1.03	1.20	1.71	182.0	26.05	1007
D	18:43	1589.1	1587.5	1582.8	9.7	11.5	116	4200	16634	1707	39.3	1.20	1.20	32.4	34.0	.35	.47	6.2	1.26	.87	1.03	1.20	1.71	183.0	26.15	1004
D	18:45	1590.2	1588.6	1582.8	30.4	10.5	118	3570	16728	1724	38.9	1.20	1.21	32.5	34.1	.35	.47	7.5	1.04	.87	1.03	1.20	1.71	184.1	26.19	1000
D	18:59	1591.2	1589.6	1584.4	32.6	12.7	119	2940	13655	1821	41.2	1.20	1.20	32.2	34.7	.35	.44	17.5	.93	.87	1.03	1.20	1.71	185.1	26.24	996
D	19: 4	1592.1	1590.5	1585.6	11.8	10.5	122	3990	19383	1770	45.2	1.20	1.20	31.8	33.8	.34	.43	3.7	1.31	.87	1.03	1.20	1.71	186.0	26.31	993
D	19: 7	1593.2	1591.5	1586.2	13.8	11.1	123	3570	19272	1767	47.0	1.20	1.20	31.6	34.6	.34	.41	5.0	1.27	.87	1.03	1.20	1.71	187.0	26.37	990
D	19:11	1594.1	1592.5	1587.4	19.0	12.1	122	4200	19334	1767	51.4	1.20	1.20	31.4	35.0	.34	.43	7.5	1.21	.87	1.03	1.20	1.71	188.0	26.43	986
D	19:17	1595.2	1593.5	1588.3	8.2	11.6	122	4200	16052	1662	50.6	1.20	1.20	31.1	35.1	.32	.42	3.7	1.42	.87	1.03	1.20	1.71	189.0	26.53	984
D	19:23	1596.2	1594.6	1589.2	12.5	11.2	123	4410	17783	1681	63.2	1.20	1.20	30.9	35.1	.29	.42	12.5	1.31	.87	1.03	1.20	1.71	190.1	26.63	982
D	19:27	1597.2	1595.5	1590.4	16.3	11.7	124	5250	18000	1681	67.9	1.20	1.20	30.5	34.6	.29	.43	11.3	1.24	.87	1.03	1.20	1.71	191.0	26.70	979
D	19:38	1598.2	1596.5	1590.4	22.3	12.6	122	5250	17845	1662	69.9	1.20	1.20	30.4	34.8	.29	.41	12.5	1.13	.87	1.03	1.20	1.71	192.0	26.74	975
D	19:32	1599.2	1597.5	1590.4	39.3	11.8	123	4200	18776	1767	69.9	1.20	1.20	30.3	34.8	.29	.39	12.5	1.00	.87	1.03	1.20	1.71	193.0	26.78	971
D	19:34	1600.2	1598.5	1591.4	26.9	11.4	121	3360	17845	1734	69.5	1.20	1.20	30.4	34.7	.29	.39	7.5	1.08	.87	1.03	1.20	1.71	194.0	26.82	968
D	19:40	1601.1	1599.6	1591.7	60.7	12.1	115	2940	15176	1659	66.0	1.20	1.20	30.4	34.7	.29	.38	21.2	.80	.87	1.03	1.20	1.71	195.1	26.83	963
D	19:42	1602.2	1600.5	1592.0	28.1	11.2	119	6300	16759	1655	66.8	1.20	1.20	30.3	34.9	.29	.39	17.5	1.09	.87	1.03	1.20	1.71	196.0	26.87	959
D	19:43	1603.2	1601.5	1592.3	24.3	9.9	120	6720	15176	1679	67.4	1.20	1.20	30.4	34.6	.29	.38	13.7	1.00	.87	1.03	1.20	1.71	197.0	26.90	955
D	19:45	1604.2	1602.5	1593.2	29.3	11.6	119	7140	17969	1751	68.1	1.20	1.20	30.5	34.8	.29	.38	11.3	1.04	.87	1.03	1.20	1.71	198.0	26.93	951
D	19:48	1605.2	1603.5	1593.8	26.6	11.8	120	6510	17869	1734	68.3	1.20	1.20	30.6	34.8	.29	.38	12.5	1.09	.87	1.03	1.20	1.71	199.0	26.97	948
D	19:50	1606.2	1604.5	1594.4	29.8	10.9	120	7140	17845	1734	68.3	1.20	1.20	30.6	34.8	.30	.37	13.7	1.07	.87	1.03	1.20	1.71	200.0	27.01	944

GEOSERVICES — HAMMERHEAD #1 — DATE : 11/ 6/82

BIT#15 RUN#3B REED HSS1 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 18 YP = 29 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	DRILLING PARAMETERS ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	19:53	1607.2	1605.5	1594.7	20.5	11.5	121	7140	17224	1724	68.1	1.20	1.20	30.8	34.7	.30	.37	13.7	1.16	.87	1.03	1.20	1.71	201.0	27.05	941
D	19:56	1608.2	1606.5	1595.3	19.4	11.7	119	6510	17255	1681	68.1	1.20	1.20	30.9	34.6	.30	.37	15.0	1.10	.87	1.03	1.20	1.71	202.0	27.11	937
D	19:58	1609.1	1607.6	1595.6	26.1	10.5	122	6930	18093	1681	68.1	1.20	1.20	31.0	34.7	.30	.37	13.7	1.09	.87	1.03	1.20	1.71	203.1	27.14	934
D	20:10	1610.2	1608.5	1597.2	27.6	11.5	119	2730	18124	1662	65.0	1.20	1.19	31.4	35.2	.30	.34	18.7	1.03	.87	1.03	1.20	1.71	204.0	27.18	931
D	20:13	1611.2	1609.6	1598.4	26.0	10.2	120	4410	16883	1621	65.0	1.20	1.19	31.5	35.6	.30	.34	18.7	1.00	.87	1.03	1.20	1.71	205.1	27.22	927
D	20:15	1612.1	1610.0	1599.0	22.3	10.0	121	3990	17410	1695	65.2	1.20	1.19	31.5	35.0	.31	.34	20.0	1.11	.87	1.03	1.20	1.71	205.5	27.26	925
D	20:18	1613.2	1611.6	1600.2	16.6	9.9	123	7140	17317	1658	65.4	1.20	1.19	31.7	34.5	.31	.35	18.7	1.19	.87	1.03	1.20	1.71	207.1	27.31	920
D	20:20	1614.1	1612.6	1601.1	28.2	10.0	118	7140	17317	1643	65.2	1.20	1.19	31.8	35.1	.31	.35	20.0	1.06	.87	1.03	1.20	1.71	208.1	27.34	917
D	20:22	1615.2	1613.5	1602.6	23.8	10.9	119	7980	17206	1626	64.8	1.20	1.19	31.9	35.1	.31	.36	21.2	1.11	.87	1.03	1.20	1.71	209.0	27.38	914
D	20:25	1616.1	1614.6	1603.6	23.7	9.7	117	8190	17206	1645	64.6	1.20	1.19	31.9	35.0	.31	.35	20.0	1.07	.87	1.03	1.20	1.71	210.1	27.42	910
D	20:27	1617.2	1615.5	1604.5	40.2	11.0	122	7770	17317	1698	64.6	1.20	1.19	32.1	35.0	.31	.36	15.0	.94	.87	1.03	1.20	1.71	211.0	27.45	907
D	20:29	1618.2	1616.5	1605.7	22.9	10.9	119	8190	17317	1645	64.2	1.20	1.19	32.2	35.2	.31	.35	17.5	1.12	.87	1.03	1.20	1.71	212.1	27.50	904
D	20:40	1619.2	1617.5	1607.0	34.8	10.6	116	2940	16510	1607	64.2	1.20	1.19	32.4	35.3	.31	.36	20.0	.79	.87	1.03	1.20	1.71	213.0	27.53	901
D	20:42	1620.1	1618.5	1608.7	27.6	11.1	117	4200	17441	1662	64.6	1.20	1.19	32.6	35.5	.31	.35	20.0	1.05	.87	1.03	1.20	1.71	214.0	27.57	898
D	20:45	1621.2	1619.5	1609.3	18.1	10.6	120	6510	17534	1645	64.6	1.20	1.20	32.6	35.5	.31	.35	17.5	1.15	.87	1.03	1.20	1.71	215.1	27.62	895
D	20:49	1622.2	1620.6	1609.3	12.7	11.0	116	6510	17255	1645	64.6	1.20	1.19	32.9	35.3	.31	.36	16.2	1.23	.87	1.03	1.20	1.71	216.1	27.69	892
D	20:53	1623.1	1621.5	1611.2	18.5	11.2	117	6300	17030	1677	65.0	1.20	1.20	32.9	35.5	.31	.37	21.2	1.15	.87	1.03	1.20	1.71	217.1	27.75	890
D	20:55	1624.1	1622.5	1612.4	27.6	11.1	118	6720	17007	1643	65.0	1.20	1.20	33.0	35.3	.31	.36	17.5	1.05	.87	1.03	1.20	1.71	218.0	27.79	887
D	21: 3	1625.2	1623.5	1615.1	5.0	10.6	115	5460	16572	1645	64.6	1.20	1.20	33.3	35.2	.31	.37	23.7	1.49	.87	1.03	1.20	1.71	219.0	27.91	886
T	21:23	1625.8	1624.0	1621.5	----	----	120	5080	15207	1679	64.8	1.20	1.19	33.4	35.5	.33	.37	18.7	----------		----------					
D	21:31	1626.1	1624.5	1623.7	2.3	13.0	124	5080	15083	1681	64.6	1.20	1.19	33.4	35.7	.33	.36	20.0	1.78	.87	1.03	1.20	1.71	220.0	28.38	893
T	21:51	1626.8	1625.1	1625.5	----	----	123	6090	14369	1665	66.2	1.20	1.19	33.2	35.5	.33	.36	18.7	----------		----------					
D	21:58	1627.2	1625.5	1625.8	2.0	12.6	123	6300	13041	1665	66.0	1.20	1.19	33.1	35.3	.34	.36	16.2	1.00	.87	1.03	1.20	1.71	221.1	28.84	903
T	22:18	1628.1	1626.5	1626.1	----	----	117	3570	12910	1592	60.1	1.20	1.19	32.4	35.4	.33	.37	17.5	----------		----------					
D	22:19	1628.2	1626.5	1626.1	3.6	12.0	121	3780	12079	1598	60.1	1.20	1.19	32.4	35.4	.34	.37	17.5	1.63	.87	1.03	1.20	1.71	222.0	29.01	903
T	22:39	1628.7	1627.0	1626.7	----	----	118	3570	15610	1823	73.7	1.20	1.19	32.6	34.0	.34	.39	15.0	----------		----------					
D	22:53	1629.1	1627.5	1627.9	2.0	12.6	120	5250	15455	1791	76.9	1.20	1.19	32.7	34.6	.34	.38	13.7	1.82	.87	1.03	1.20	1.71	223.0	29.53	911
D	23:11	1630.2	1628.5	1628.5	3.9	11.9	119	5250	16945	1986	69.7	1.20	1.18	32.4	33.7	.34	.38	15.0	1.64	.87	1.03	1.20	1.71	224.0	29.82	916
D	23:13	1631.2	1629.5	1628.5	40.5	11.5	119	7770	17224	1878	66.2	1.20	1.18	32.3	33.9	.34	.37	15.0	.90	.87	1.03	1.20	1.71	225.0	29.85	913
D	23:21	1632.1	1630.5	1628.9	13.7	12.1	121	7140	16945	1871	64.4	1.20	1.18	32.1	33.4	.35	.38	11.3	1.27	.87	1.03	1.20	1.71	226.0	29.99	913
D	23:23	1633.2	1631.5	1628.9	34.6	11.5	117	7560	16107	1871	64.4	1.20	1.18	32.0	33.5	.34	.38	13.7	.99	.87	1.03	1.20	1.71	227.1	30.02	909
D	23:29	1634.2	1632.6	1629.2	34.4	12.0	119	4830	12103	1640	65.6	1.20	1.18	31.8	33.9	.34	.37	15.0	1.02	.87	1.03	1.20	1.71	228.1	30.06	906
D	23:32	1635.1	1633.6	1629.2	16.3	10.9	120	5040	12072	1662	65.6	1.20	1.18	31.8	34.2	.34	.37	12.5	1.21	.87	1.03	1.20	1.72	229.1	30.10	903
D	23:37	1636.1	1634.6	1629.5	8.3	10.1	122	7770	12134	1659	66.4	1.20	1.19	31.8	33.8	.34	.38	12.5	1.36	.87	1.03	1.20	1.72	230.1	30.20	902
D	23:52	1637.2	1635.0	1630.4	13.2	3.3	118	2520	14431	1753	69.5	1.20	1.18	31.6	34.0	.34	.38	21.2	1.24	.87	1.03	1.20	1.72	230.5	30.25	901
D	23:54	1638.2	1636.0	1631.3	27.1	12.8	116	3780	14245	1770	68.1	1.20	1.18	31.5	34.1	.34	.38	16.2	1.05	.87	1.03	1.20	1.72	231.6	30.29	898
D	23:57	1639.2	1637.5	1631.3	28.0	10.5	120	3570	14121	1753	67.7	1.20	1.18	31.5	34.6	.34	.38	15.0	1.06	.87	1.03	1.20	1.72	233.1	30.34	894
D	23:59	1640.2	1638.5	1631.6	25.4	11.1	119	3570	13072	1770	67.6	1.20	1.18	31.5	34.6	.34	.38	17.5	1.09	.87	1.03	1.20	1.72	234.0	30.37	891
D	0: 1	1641.2	1639.5	1632.2	21.1	11.1	119	3780	13810	1753	67.6	1.20	1.18	31.5	34.3	.34	.38	16.2	1.13	.87	1.03	1.20	1.72	235.0	30.41	888
D	0: 5	1642.2	1640.5	1633.1	19.8	11.1	119	7980	14070	1770	67.6	1.20	1.18	31.5	33.7	.34	.38	16.2	1.15	.87	1.03	1.20	1.72	236.1	30.47	886
D	0: 6	1643.2	1641.5	1633.1	35.6	11.5	120	7980	14276	1770	68.5	1.20	1.18	31.5	33.5	.34	.39	15.0	.99	.87	1.03	1.20	1.72	237.0	30.50	883
D	0:15	1644.2	1642.5	1635.6	28.7	11.3	115	3570	14990	1751	71.3	1.20	1.18	31.5	33.6	.34	.38	13.7	1.05	.87	1.03	1.20	1.72	238.0	30.53	880
D	0:16	1645.2	1643.6	1635.9	42.4	10.6	118	6510	15207	1751	71.5	1.20	1.19	31.5	33.7	.34	.38	15.0	.95	.87	1.03	1.20	1.72	239.1	30.55	876
D	0:19	1646.2	1644.5	1636.2	20.1	11.2	119	7770	15145	1767	71.5	1.20	1.19	31.5	33.8	.34	.38	12.5	1.16	.87	1.03	1.20	1.72	240.1	30.60	874
D	0:31	1647.2	1645.6	1636.8	37.1	10.3	120	3990	15059	1770	70.5	1.20	1.18	31.7	34.3	.34	.38	17.5	.98	.87	1.03	1.20	1.72	241.1	30.63	871
D	0:33	1648.1	1646.6	1636.8	33.5	11.6	122	6930	15059	1786	70.1	1.20	1.17	31.8	34.3	.34	.37	15.0	1.03	.87	1.03	1.20	1.72	242.1	30.66	868
D	0:37	1649.1	1647.6	1638.3	18.8	10.6	119	8400	15828	1883	68.9	1.20	1.17	31.8	33.7	.34	.38	11.3	1.17	.87	1.03	1.20	1.72	243.1	30.72	866
D	0:39	1650.2	1648.6	1639.5	27.6	11.6	117	8400	16510	1787	68.9	1.20	1.17	31.9	33.5	.33	.38	11.3	1.18	.87	1.03	1.20	1.72	244.2	30.76	863
D	0:42	1651.2	1649.5	1640.7	15.6	12.5	122	7560	15393	1779	69.3	1.20	1.17	31.9	33.3	.33	.39	15.0	1.22	.87	1.03	1.20	1.72	245.1	30.81	861

GEOSERVICES — HAMMERHEAD #1 — DATE : 12/ 6/02

BIT#15 RUN#30 REED HSSI BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 18 YP = 29 GEL = 2

		DEPTHS				DRILLING PARAMETERS						MUD PARAMETERS						GAS		OVERPRESSURE SURVEY				ACCUMULATED ON BIT		
	TIME	MEASURED	VERTCL	LAGGED	ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT		DCS	NORM	PF	ECD	FRAC	METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/m	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	0:46	1652.3	1650.5	1642.0	17.9	12.5	118	8190	18776	1707	68.7	1.20	1.17	31.9	33.4	.32	.39	10.0	1.19	.87	1.03	1.20	1.72	246.1	30.87	859
D	0:49	1653.1	1651.8	1643.2	16.6	11.1	120	8190	18900	1707	68.3	1.20	1.17	32.0	33.1	.32	.39	11.3	1.22	.87	1.03	1.20	1.72	246.5	30.92	858
D	1: 2	1654.1	1652.5	1645.9	22.9	5.8	121	3360	17721	1717	69.1	1.20	1.17	32.1	34.1	.32	.38	15.0	1.14	.87	1.03	1.20	1.72	248.0	30.97	854
D	1: 4	1655.2	1653.6	1645.9	27.9	12.8	122	3990	17783	1698	69.1	1.20	1.17	32.0	34.7	.32	.37	13.7	1.12	.87	1.03	1.20	1.72	249.1	31.01	852
D	1:11	1656.2	1654.1	1646.2	36.4	10.2	121	3990	19117	1770	70.3	1.20	1.17	31.9	34.6	.32	.38	21.2	.94	.87	1.03	1.20	1.72	249.6	31.03	850
D	1:13	1657.2	1655.5	1647.8	19.5	11.9	120	7140	19140	1767	69.7	1.20	1.17	31.9	34.4	.32	.38	11.3	1.16	.87	1.03	1.20	1.72	251.1	31.07	847
D	1:16	1658.2	1656.5	1648.1	25.3	11.8	120	6930	19179	1770	69.5	1.20	1.17	32.0	34.9	.32	.38	15.0	1.08	.87	1.03	1.20	1.72	252.0	31.11	844
D	1:19	1659.2	1657.5	1649.6	16.7	11.4	121	8400	19303	1789	69.7	1.20	1.18	32.0	34.7	.32	.38	13.7	1.21	.87	1.03	1.20	1.72	253.0	31.16	842
D	1:22	1660.1	1658.5	1650.5	18.2	11.4	124	7980	19334	1803	69.5	1.20	1.17	31.9	34.3	.32	.39	12.5	1.19	.87	1.03	1.20	1.72	254.0	31.21	840
D	1:24	1661.1	1659.1	1651.1	19.9	11.1	121	8190	19334	1806	69.9	1.20	1.17	32.0	33.9	.32	.39	16.2	1.14	.87	1.03	1.20	1.72	254.6	31.25	839
D	1:28	1662.2	1660.5	1652.3	11.8	12.6	125	8400	19334	1806	70.3	1.20	1.18	32.1	33.6	.32	.39	13.7	1.32	.87	1.03	1.20	1.72	256.0	31.32	836
D	1:30	1663.1	1661.5	1653.5	35.9	10.5	122	7980	19334	1803	70.7	1.20	1.17	32.0	33.6	.32	.39	16.2	1.01	.87	1.03	1.20	1.72	257.1	31.36	833
D	1:34	1664.2	1662.5	1653.8	27.6	11.4	124	7980	19334	1820	70.9	1.20	1.18	32.1	33.5	.32	.38	17.5	1.09	.87	1.03	1.20	1.72	258.1	31.42	831
D	1:45	1665.2	1663.5	1654.8	29.2	11.4	118	3990	19117	1707	72.1	1.20	1.18	32.0	33.7	.32	.38	20.0	.99	.87	1.03	1.20	1.72	259.0	31.46	829
D	1:48	1666.1	1664.1	1655.4	24.7	13.0	120	7980	19148	1803	74.3	1.20	1.17	31.9	34.1	.32	.38	20.0	1.10	.87	1.03	1.20	1.72	259.6	31.51	828
D	1:51	1667.2	1665.5	1657.2	19.1	13.3	120	7980	18776	1704	73.9	1.20	1.18	31.9	34.7	.33	.38	18.7	1.16	.87	1.03	1.20	1.72	261.0	31.57	825
D	1:55	1668.2	1666.6	1658.7	20.6	11.6	116	7770	18372	1803	73.9	1.20	1.18	31.9	34.2	.33	.39	21.2	1.16	.87	1.03	1.20	1.72	262.1	31.62	823
D	1:57	1669.2	1667.8	1659.6	25.5	12.2	116	7770	18520	1787	74.1	1.20	1.17	31.8	34.4	.33	.38	18.7	1.10	.87	1.03	1.20	1.72	262.6	31.66	822
D	2: 0	1670.2	1668.5	1660.6	23.6	11.4	122	7980	18341	1803	74.3	1.20	1.18	31.9	34.1	.33	.38	20.0	1.12	.87	1.03	1.20	1.72	264.1	31.71	819
D	2: 3	1671.3	1669.6	1661.5	37.1	9.6	119	7980	18279	1808	74.3	1.20	1.18	31.8	33.8	.33	.38	20.0	.97	.87	1.03	1.20	1.72	265.1	31.75	817
D	2: 5	1672.2	1670.8	1661.8	24.0	11.8	117	8190	18124	1803	74.5	1.20	1.18	31.9	33.8	.33	.38	20.0	1.11	.87	1.03	1.20	1.72	265.6	31.79	816
D	2: 7	1673.2	1671.5	1662.4	19.8	12.0	117	8190	17969	1803	74.5	1.20	1.18	31.9	33.5	.33	.38	20.0	1.16	.87	1.03	1.20	1.72	267.0	31.83	813
D	2:15	1674.2	1672.5	1664.2	18.9	11.4	120	5040	16448	1724	76.1	1.20	1.18	32.0	33.3	.33	.38	21.2	1.12	.87	1.03	1.20	1.72	268.0	31.88	811
D	2:17	1675.2	1673.5	1664.5	36.6	12.4	123	8610	16634	1715	75.7	1.20	1.18	32.0	33.6	.33	.38	20.0	.99	.88	1.03	1.20	1.72	269.1	31.90	808
D	2:19	1676.1	1674.6	1664.5	20.5	10.8	125	8400	16603	1734	75.3	1.20	1.17	31.9	33.8	.33	.38	18.7	1.14	.88	1.03	1.20	1.72	270.1	31.95	806
D	2:23	1677.2	1675.5	1665.4	22.2	11.5	120	8610	16510	1734	74.5	1.20	1.17	32.0	33.1	.33	.37	16.2	1.13	.88	1.03	1.20	1.72	271.1	32.00	804
D	2:25	1678.2	1676.5	1666.0	28.4	11.2	120	8610	16541	1732	73.9	1.20	1.17	32.1	33.1	.33	.38	17.5	1.06	.88	1.03	1.20	1.72	272.0	32.05	802
D	2:45	1679.2	1677.5	1672.7	1.9	12.8	121	7770	16798	1717	72.7	1.20	1.19	32.1	32.8	.33	.37	21.2	1.77	.88	1.03	1.20	1.72	273.0	32.37	806
T	3: 5	1679.7	1678.0	1678.5	----	----	122	5460	16634	1715	72.1	1.20	1.18	32.1	33.6	.33	.37	20.0	----	----	----	----	----	----	----	----
D	3:17	1680.2	1678.6	1678.8	1.9	12.6	123	5250	17131	1722	70.3	1.20	1.18	32.1	32.9	.33	.38	17.5	1.80	.88	1.03	1.20	1.72	274.1	32.91	814
T	3:37	1681.0	1679.0	1679.5	----	----	122	5460	17659	1715	69.9	1.20	1.17	32.1	33.2	.32	.38	21.2	----	----	----	----	----	----	----	----
D	3:40	1681.2	1679.5	1679.5	3.6	12.1	120	5460	17721	1715	70.1	1.20	1.17	32.1	33.3	.32	.38	20.0	1.61	.88	1.03	1.20	1.72	275.0	33.29	820
D	3:47	1682.1	1680.5	1679.8	10.7	12.6	122	8190	17876	1715	69.9	1.20	1.17	32.1	33.1	.33	.38	17.5	1.33	.88	1.03	1.20	1.72	276.1	33.40	819
D	3:52	1683.1	1681.5	1680.1	11.6	12.2	121	7560	17987	1732	69.5	1.20	1.17	32.2	33.2	.33	.38	18.7	1.31	.88	1.03	1.20	1.72	277.0	33.49	818
T	4:12	1683.3	1681.5	1680.7	----	----	16	1260	17162	1681	69.3	1.20	1.18	32.4	38.3	.32	.38	22.5	----	----	----	----	----	----	----	----
T	4:32	1683.3	1681.5	1683.1	----	----	0	.000	-1552	0	69.5	1.20	1.17	33.7	39.4	.32	.37	20.0	----	----	----	----	----	----	----	----
T	4:52	1683.5	1681.5	1683.1	----	----	0	.000	7293	1078	71.5	1.20	1.18	33.7	37.7	.32	.38	21.2	----	----	----	----	----	----	----	----
T	5:12	1683.5	1681.5	1683.1	----	----	0	.000	-1583	0	58.0	1.20	1.21	34.4	37.1	.32	.34	22.5	----	----	----	----	----	----	----	----
T	5:32	1683.5	1681.5	1683.1	----	----	6	1470	-1614	0	56.4	1.20	1.21	34.4	36.9	.32	.34	22.5	----	----	----	----	----	----	----	----
T	5:52	1683.5	1681.5	1683.1	----	----	0	.000	-1614	0	56.0	1.20	1.22	34.3	36.7	.32	.34	22.5	----	----	----	----	----	----	----	----

ON-LINE TDC
GEOSERVICES BIT REPORT

* 12/ 6/82 HAMMERHEAD #1

*BIT HEADING :BIT#15 RUN#3#
*BIT TYPE :INSERT
*BIT IDENTITY :REED HSS1

*BIT SIZE : 8.50 INCH
*BIT COST : 8888. $ RIG COST/HR: 5833.

*NOZZLES : 11 11 11 /32NDS @ 95 % EFFICIENCY

*DEPTH IN : 1405.99 METERS 10/ 6/82
*DEPTH OUT : 1683.49 METERS 12/ 6/82
*METRAGE : 277.50 METERS
*TOTAL REVOLUTIONS : 239

*DRILLING TIME: 33:39 HR AVERAGE ROP: 8.25 M/HR
*TIME IN HOLE : 43:18 HR AVERAGE ROP: 6.41 M/HR
*TRIP TIME : 4: 0 HR

*DRILLING COST STANDARD : 1023.2 $/MET
*DRILLING COST ON BOTTOM : 826.8 $/MET
*DRILLING COST MINIMUM : 818.2 $/MET

* AVERAGE OVER THE RUN AVERAGE HYDRAULICS

*WEIGHT ON BIT : 18.59 TONS NOZZLES SPEED : 174.00 M/S
*ROTATION : 118.32 RPM PRESSURE DROP : 20102 KPA
*FLOW RATE :1873.96 L/MN HYDRAULIC POWER: 842.07 H.P
*STAND PIPE PRESSURE: 15588 KPA

ON-LINE TDC
GEOSERVICES HYDRAULIC REPORT

* 12/ 6/82 TIME 6:12 HAMMERHEAD #1

* DEPTH OF EXECUTION 1683.49 METERS *
* FLOW RATE 1890 L/MN POWER LAW *
*

* MUD DATA	WEIGHT	1.20	SG
* ----------	PV	18	CPS
*	YP	29.00	LB/FT2
*	GEL	2.00	LB/100 FT2
*	N	.4954	
*	K	2.1901	LB/100 FT2

* HOLES VOLUMES	WITH PIPES	70.11	M3
* ------------	WITHOUT PIPES	78.45	M3
*	ANNULAR	55.61	M3
*	INSIDE PIPES	14.50	M3

	FROM METERS	TO METERS	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA		H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						335	14					
DR.STRING	.00	1462.80	4.28	5.00		1931	82					
DR.STRING	1462.80	1518.50	3.00	5.00		403	17					
DR.STRING	1518.50	1691.84	2.81	6.50		1700	72					
BIT						20448	864	H/S			175.5	
ANNULUS	1683.49	1510.15		6.50	8.50	347	15	LA	2117.9		124.3	121.9
ANNULUS	1510.15	1454.45		5.00	8.50	40	2	LA	2788.0		78.9	77.4
ANNULUS	1454.45	1184.00		5.00	8.50	193	8	LA	2788.0		78.9	77.4
ANNULUS	1184.00	143.00		5.00	8.69	669	28	LA	2930.6		73.8	72.4
ANNULUS	143.00	.00		5.00	16.75	9	0	LA	10229.		14.6	14.0
TOTAL						26082	1102					

*ANNULAR PRESSURE LOSSES 1258 KPA

*EQUIV.CIRCULATING DENSITY 1.28 SG
* MAX DEPTH 2053.93

* MUD LAG TIMES	S -) B	7.67	MN
* ------------	B -) S	29.42	MN

* CUTTINGS DATA	SIZE	.20	CM
* ------------	DENSITY	2.40	SG
*	LAG TIME	30.21	MN
*	MAX SLIP VELOCITY	2.44	M/MN

* BIT DATA	SIZE	8.50 INCH
* --------	NOZZLES	11 11 11 /32NDS
*	NOZZLES EFFICIENCY	95 %
*	BIT P. LOSSES	20448 KPA
*	H.H.P RATIO	78.40 %
*	BIT H.H.P	15.224
*	BIT VELOCITY	175.49 M/S

GEOSERVICES — HAMMERHEAD #1 — DATE : 12/ 6/92

ON-LINE TDC

BIT#15 RUN#3B REED HSS1 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 MUD RHEOLOGICAL PARAMETERS : PV = 18 YP = 29 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	net	net	net	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	net	Hr	$/m
T	7: 3	1683.5	1681.5	1683.1	——	----	0	.000	17076	570	52.4	1.20	1.21	33.8	25.0	.32	.38	23.7								
D	7:21	1687.0	1685.0	1678.0	10.6	13.7	125	3700	14897	1770	52.2	1.20	1.20	32.4	33.6	.33	.35	16.2	1.32	.00	1.03	1.20	1.73	281.0	33.79	813
D	7:30	1688.6	1687.0	1678.8	8.9	11.9	122	7350	15083	1796	53.4	1.20	1.20	31.8	33.7	.33	.37	15.0	1.43	.00	1.03	1.20	1.73	283.0	33.94	810
D	7:35	1689.4	1687.6	1678.8	28.3	11.4	127	7350	14772	1787	53.6	1.20	1.20	31.7	33.1	.33	.37	16.2	1.89	.00	1.03	1.20	1.73	283.7	34.02	809
D	7:40	1690.2	1688.5	1678.8	10.8	13.7	120	7560	14897	1789	53.0	1.20	1.20	31.6	32.3	.33	.38	17.5	1.40	.00	1.03	1.20	1.73	284.6	34.10	809
D	7:45	1691.2	1689.6	1671.8	10.8	14.3	121	7350	14772	1787	54.2	1.20	1.19	31.5	31.9	.33	.39	16.2	1.30	.00	1.03	1.20	1.73	285.6	34.19	808
D	7:53	1692.2	1690.6	1686.2	10.3	12.8	125	7350	14524	1806	54.0	1.20	1.18	31.4	32.0	.33	.41	6.2	1.39	.00	1.03	1.20	1.73	286.6	34.31	807
D	7:57	1693.2	1691.6	1687.4	10.7	12.9	123	7350	14431	1787	54.0	1.20	1.20	31.3	32.2	.33	.38	7.5	1.30	.00	1.03	1.20	1.73	287.7	34.39	806
D	8: 1	1694.2	1692.6	1688.0	15.3	13.1	127	7350	14431	1810	54.2	1.20	1.20	31.3	32.2	.34	.38	7.5	1.27	.00	1.03	1.20	1.73	288.7	34.44	805
D	8:13	1695.2	1693.5	1689.2	22.0	11.2	125	5250	14772	1825	54.4	1.20	1.20	31.2	33.4	.33	.38	7.5	1.13	.00	1.03	1.20	1.73	289.6	34.55	804
D	8:17	1696.2	1694.6	1689.0	20.4	13.4	129	5250	15269	1820	53.2	1.20	1.20	31.2	33.2	.34	.38	7.5	1.17	.00	1.03	1.20	1.73	290.6	34.62	802
D	8:25	1697.1	1695.6	1691.6	29.4	12.6	127	5460	14998	1873	53.2	1.20	1.20	31.3	32.7	.34	.39	6.2	1.09	.00	1.03	1.20	1.73	291.6	34.77	803
D	8:30	1698.2	1696.5	1692.3	10.6	12.9	122	5250	15952	1822	53.2	1.20	1.20	31.3	32.7	.34	.39	6.2	1.34	.00	1.03	1.20	1.73	292.6	34.85	802
D	8:37	1699.2	1697.0	1693.8	12.5	12.2	122	7770	15517	1839	53.2	1.20	1.20	31.3	32.1	.34	.39	6.2	1.32	.00	1.03	1.20	1.73	293.1	34.96	801
D	8:43	1700.2	1698.6	1694.1	11.1	14.7	120	7980	16231	1839	53.2	1.20	1.19	31.4	32.1	.34	.39	6.2	1.33	.00	1.03	1.20	1.73	294.6	35.05	800
D	8:48	1701.2	1699.6	1695.3	12.0	11.9	122	7770	16130	1834	53.4	1.20	1.19	31.3	32.2	.34	.38	1.2	1.33	.00	1.03	1.20	1.73	295.6	35.13	799
D	8:52	1702.2	1700.5	1696.2	12.1	13.2	121	8190	15300	1798	53.6	1.20	1.19	31.3	32.4	.34	.39	3.7	1.33	.00	1.03	1.20	1.73	296.6	35.21	798
D	8:56	1703.2	1701.5	1696.2	11.7	10.8	122	7350	15145	1753	53.6	1.20	1.19	31.3	32.0	.33	.39	2.5	1.27	.00	1.03	1.20	1.73	297.6	35.27	796
D	9: 7	1704.2	1702.5	1697.4	14.2	10.2	121	3990	15455	1734	53.6	1.20	1.20	31.2	32.8	.33	.37	2.5	1.23	.00	1.03	1.20	1.73	298.6	35.33	795
D	9:12	1706.2	1704.1	1698.3	19.9	12.7	121	5460	15145	1734	53.4	1.20	1.20	31.2	32.8	.33	.38	5.0	1.21	.00	1.03	1.20	1.73	300.1	35.41	792
D	9:16	1707.1	1705.6	1699.0	18.2	12.9	119	5880	14959	1734	53.2	1.20	1.20	31.3	32.8	.34	.39	5.0	1.21	.00	1.03	1.20	1.73	301.7	35.48	790
D	9:22	1708.2	1706.6	1699.9	10.3	11.0	123	7770	14245	1772	53.4	1.20	1.20	31.3	32.9	.34	.38	5.0	1.34	.00	1.03	1.20	1.73	302.6	35.57	789
D	9:28	1709.2	1707.5	1701.1	8.3	13.2	119	7770	14679	1772	53.4	1.20	1.20	31.3	32.6	.34	.39	6.2	1.44	.00	1.03	1.20	1.73	303.6	35.67	789
D	9:32	1710.2	1708.5	1702.8	19.1	12.3	117	7770	14555	1789	53.4	1.20	1.20	31.4	32.4	.34	.39	3.7	1.18	.00	1.03	1.20	1.73	304.6	35.74	787
D	9:37	1711.2	1709.5	1702.9	12.7	12.3	122	7770	13655	1734	53.2	1.20	1.20	31.4	32.6	.34	.39	7.5	1.29	.00	1.03	1.20	1.73	305.6	35.82	786
D	9:40	1712.2	1710.6	1703.2	17.9	10.0	119	7980	15021	1770	53.0	1.20	1.20	31.3	32.6	.34	.39	7.5	1.17	.00	1.03	1.20	1.73	306.6	35.86	784
D	9:57	1713.2	1711.6	1706.9	23.8	10.9	117	7560	16130	1698	52.8	1.20	1.20	31.5	33.7	.33	.38	7.5	1.12	.00	1.03	1.20	1.73	307.6	35.95	783
D	10: 2	1714.2	1712.1	1707.8	12.7	12.4	119	8400	15672	1698	51.8	1.20	1.19	31.5	33.1	.33	.38	5.0	1.28	.00	1.03	1.20	1.73	308.1	36.03	783
T	10:22	1715.1	1713.5	1712.1	----	----	117	7560	14330	1710	53.4	1.20	1.19	31.5	31.9	.34	.39	3.7								
D	10:23	1715.1	1713.5	1712.1	2.2	12.6	119	7770	14480	1710	53.4	1.20	1.19	31.6	31.8	.34	.39	3.7	1.80	.00	1.03	1.20	1.73	309.6	36.38	786
D	10:37	1716.2	1714.5	1713.9	3.8	15.0	120	7770	14330	1734	52.8	1.20	1.19	31.5	31.8	.34	.38	1.2	1.72	.00	1.03	1.20	1.73	310.6	36.61	788
T	10:57	1716.9	1715.8	1714.8	----	----	120	7560	14897	1715	52.8	1.20	1.20	31.2	31.7	.34	.38	6.2								
D	11: 4	1717.2	1715.5	1715.4	2.2	13.6	121	7980	14640	1737	52.2	1.20	1.20	31.1	32.0	.34	.38	3.7	1.82	.00	1.03	1.20	1.73	311.6	37.06	794
D	11:17	1718.1	1716.0	1716.3	2.8	12.7	120	8190	14679	1710	52.0	1.20	1.20	31.0	31.5	.34	.39	2.5	1.73	.00	1.03	1.20	1.73	312.1	37.20	796
D	11:21	1719.2	1717.6	1716.3	14.8	13.7	120	8400	12476	1734	51.8	1.20	1.20	31.0	31.6	.34	.38	2.5	1.28	.00	1.03	1.20	1.73	313.6	37.36	795
D	11:28	1720.2	1718.6	1716.6	8.0	12.9	122	7980	14555	1725	51.6	1.20	1.21	30.9	31.9	.34	.39	5.0	1.44	.00	1.03	1.20	1.73	314.6	37.46	794
D	11:45	1721.2	1719.5	1716.9	7.0	11.6	106	4620	14369	1731	43.0	1.20	1.20	30.8	32.8	.35	.37	5.0	1.42	.00	1.03	1.20	1.73	315.6	37.62	794
D	11:59	1722.2	1720.1	1718.5	5.2	13.4	123	7980	15952	1889	43.4	1.20	1.20	30.7	33.1	.36	.38	6.2	1.45	.00	1.03	1.20	1.73	316.1	37.84	795
T	12:19	1722.5	1720.6	1720.9	----	----	0	.000	13438	1022	45.4	1.20	1.20	31.0	36.8	.36	.38	13.7								

ON-LINE TDC
GEOSERVICES BIT REPORT

* 12/ 6/82 HAMMERHEAD #1

*BIT HEADING :BIT#15 RUN#30
*BIT TYPE :INSERT
*BIT IDENTITY :REED HSS1

*BIT SIZE : 8.50 INCH
*BIT COST : 8000. $ RIG COST/HR: 5833.

*NOZZLES : 11 11 11 /32NDS @ 95 % EFFICIENCY

*DEPTH IN : 1405.83 METERS 10/ 6/82
*DEPTH OUT : 1722.50 METERS 12/ 6/82
*METRAGE : 316.67 METERS
*TOTAL REVOLUTIONS : 270

*DRILLING TIME: 37:56 HR AVERAGE ROP: 8.35 M/HR
*TIME IN HOLE : 48:51 HR AVERAGE ROP: 6.48 M/HR
*TRIP TIME : 4: 0 HR

*DRILLING COST STANDARD : 998.7 $/MET
*DRILLING COST ON BOTTON : 797.8 $/MET
*DRILLING COST MINIMUM : 794.7 $/MET

* AVERAGE OVER THE RUN AVERAGE HYDRAULICS
*WEIGHT ON BIT : 18.78 TONS NOZZLES SPEED : 172.66 M/S
*ROTATION : 118.52 RPM PRESSURE DROP : 19794 KPA
*FLOW RATE :1859.53 L/MN HYDRAULIC POWER: 822.77 H.P
*STAND PIPE PRESSURE: 15424 KPA

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

12/ 6/82 — HAMMERHEAD #1

BIT#16 RUN#31 SEQ NBR: 0

STARTING DEPTH 1722.50 METERS

BIT DATA — SIZE 8.50 — TOOTH SEC S11 — NOZZLES 12 12 12 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	160	9.20	4.28	5.00	29.82
2	HEAVY WGT DP	1	55.78	3.00	5.00	73.80
3	DRILL COLLAR	1	173.34	2.81	6.50	136.40

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	8.69	143.00	1184.00
OPEN HOLE 1	8.50	1184.00	1722.17

COST DATA — BIT COST 5000 $ — RIG COST 5033 $/HR — TRIP TIME 4.00 HRS

WEIGHTS — HOOK LOAD OFF BOTTOM 103.4 TONS — STRING WEIGHT IN AIR 70.5 TONS

VOLUMES — ANNULUS 56.5 M3 — IN PIPES 14.8 M3

DEVIATION 1.5 DEG 2.61 M / 100 M

HYDRAULICS — NOMINAL ANNULUS PRESSURE LOSSES AT 1600 L/MN : 13 KPA

BIT WEAR — TYPE EXPONENT .5 — EXPECTED: RUN LENGTH 300 METERS TEETH WEAR 3 /8TH

GEOSERVICES — HAMMERHEAD #1 — DATE : 12/ 6/82

ON-LINE TDC

BIT#16 RUN#31 SEC S11 BIT DIAMETER : 8.50 inch NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 14 YP = 8 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	DRILLING PARAMETERS ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY BCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
T	19: 8	1722.5	1720.6	1721.8	----	----	96	2100	8620	1099	45.0	1.20	1.22	27.3	21.9	.34	.37	8.7	----------		----------			----------		
D	19:24	1723.3	1721.5	1722.4	9 2	14.3	91	2520	13203	1837	42.4	1.20	1.20	26.0	31.8	.36	.36	-3.7	1.24	1.28	1.03	1.20	1.73	.9	.08	31407
D	19:27	1724.2	1722.5	1722.4	13.7	14.9	87	2730	13190	1849	42.4	1.20	1.20	25.8	32.5	.36	.36	-7.5	1.33	1.28	1.03	1.20	1.73	1.9	.13	15138
D	19:31	1725.2	1723.6	1722.4	19.0	15.2	92	2730	13190	1854	42.6	1.20	1.21	26.1	32.8	.36	.38	-2.5	1.24	1.28	1.03	1.20	1.73	3.0	.20	9936
D	19:35	1726.2	1724.6	1722.4	13.5	15.1	87	2520	13066	1856	43.0	1.20	1.21	26.4	33.0	.35	.37	.0	1.36	1.28	1.03	1.20	1.73	4.0	.26	7552
D	19:39	1727.1	1725.5	1722.4	16.3	15.5	89	2520	13066	1856	42.8	1.20	1.21	26.8	33.2	.35	.38	.0	1.32	1.28	1.03	1.20	1.73	4.9	.33	6143
D	19:45	1728.2	1726.6	1722.4	10.2	15.0	92	2520	16324	1962	43.0	1.20	1.20	27.5	31.8	.35	.41	1.2	1.41	1.28	1.03	1.20	1.73	5.9	.43	5174
D	19:50	1729.1	1727.6	1722.7	11.9	15.2	87	2520	16541	2053	42.2	1.20	1.22	28.1	32.5	.35	.38	-10.	1.36	1.28	1.03	1.20	1.73	7.0	.51	4499
D	19:55	1730.3	1728.6	1722.7	13.1	14.6	88	2520	16479	2034	42.2	1.20	1.20	28.6	32.4	.34	.38	5.0	1.35	1.28	1.03	1.20	1.73	8.0	.58	3987
D	20: 0	1731.2	1729.6	1726.1	10.3	14.6	91	2520	16479	2034	42.6	1.20	1.20	29.5	33.5	.35	.38	11.3	1.32	1.28	1.03	1.20	1.73	9.0	.68	3599
D	20:26	1732.2	1730.6	1729.4	3.3	15.0	91	2310	16076	2034	42.2	1.20	1.20	30.8	34.2	.35	.39	10.0	1.42	1.28	1.03	1.20	1.73	9.9	.90	3374
D	20:36	1733.2	1731.5	1730.7	10.1	13.9	84	2310	16231	2053	43.0	1.20	1.20	31.4	34.7	.35	.39	8.7	1.33	1.28	1.03	1.20	1.73	10.9	1.06	3162
D	20:42	1734.2	1732.8	1731.6	9.9	14.7	89	2310	16306	2050	43.0	1.20	1.19	31.8	34.5	.35	.39	10.0	1.35	1.28	1.03	1.20	1.73	11.4	1.15	3050
D	20:47	1735.2	1733.6	1731.6	10.8	14.6	86	2520	16306	2053	43.0	1.20	1.19	32.0	35.1	.36	.37	8.7	1.30	1.28	1.03	1.20	1.73	13.0	1.24	2742
D	20:54	1736.2	1734.6	1731.9	8.6	14.8	88	2310	16541	2050	42.8	1.20	1.19	32.3	35.1	.36	.38	8.7	1.42	1.28	1.03	1.20	1.74	14.0	1.34	2590
D	21: 1	1737.2	1735.6	1732.2	8.5	15.0	83	2310	16200	2034	43.0	1.20	1.19	32.5	35.3	.36	.39	8.7	1.43	1.28	1.03	1.20	1.74	14.9	1.46	2466
D	21: 6	1738.2	1736.1	1733.1	11.0	15.5	83	2310	15020	2089	43.2	1.20	1.19	32.8	35.4	.36	.38	6.2	1.34	1.28	1.03	1.20	1.74	16.0	1.55	2336
D	21:23	1739.2	1737.6	1735.2	8.1	13.8	88	2310	15393	2016	41.6	1.20	1.19	33.1	35.8	.36	.39	8.7	1.35	1.28	1.03	1.20	1.74	17.0	1.66	2236
D	21:27	1740.1	1738.5	1736.1	10.2	16.7	87	2310	16169	2036	41.0	1.20	1.19	33.4	35.6	.36	.39	10.0	1.40	1.28	1.03	1.20	1.74	17.9	1.73	2144
D	21:33	1741.2	1739.6	1736.8	14.1	16.2	80	2940	16541	2036	40.3	1.20	1.19	33.5	35.7	.35	.39	8.7	1.34	1.28	1.03	1.20	1.74	18.9	1.82	2052
D	21:40	1742.2	1740.6	1738.0	6.4	15.8	88	2940	16634	2036	39.5	1.20	1.19	33.7	35.7	.34	.39	7.5	1.58	1.28	1.03	1.20	1.74	20.0	1.92	1977
D	21:48	1743.2	1741.6	1738.9	8.4	16.8	86	3150	17069	2016	39.1	1.20	1.19	33.9	35.8	.34	.39	6.2	1.46	1.28	1.03	1.20	1.74	20.9	2.03	1918
D	21:53	1744.2	1742.6	1739.2	15.5	17.3	86	3150	14431	1943	39.3	1.20	1.19	33.8	35.8	.34	.38	5.0	1.27	1.28	1.03	1.20	1.74	22.0	2.12	1851
D	21:57	1745.2	1743.5	1739.8	11.6	16.7	88	2940	16262	1962	39.5	1.20	1.19	33.8	35.8	.34	.39	5.0	1.38	1.28	1.03	1.20	1.74	22.9	2.19	1794
D	22: 3	1746.2	1744.6	1741.0	11.2	15.7	87	3150	16697	1978	39.5	1.20	1.19	33.9	36.1	.33	.38	.0	1.37	1.28	1.03	1.20	1.74	24.0	2.29	1739
D	22:10	1747.2	1745.6	1741.9	9.8	15.8	87	3570	16666	1981	39.3	1.20	1.19	34.0	36.4	.34	.39	5.0	1.42	1.28	1.03	1.20	1.74	25.0	2.41	1697
D	22:23	1748.2	1746.6	1743.2	13.4	16.0	70	4410	15021	1886	39.1	1.20	1.19	34.1	37.1	.33	.38	13.7	1.28	1.28	1.03	1.20	1.74	26.0	2.48	1646
D	22:29	1749.2	1747.6	1744.4	10.2	15.4	87	2730	16231	1989	38.3	1.20	1.19	34.5	37.6	.33	.38	10.0	1.36	1.28	1.03	1.20	1.74	27.0	2.59	1608
D	22:36	1750.1	1748.5	1745.9	9.7	15.6	86	2520	16231	1911	38.3	1.20	1.21	35.0	38.2	.32	.38	10.0	1.37	1.28	1.03	1.20	1.74	27.9	2.71	1576
D	22:44	1751.2	1749.5	1746.8	5.9	14.0	87	2520	16603	1926	36.9	1.20	1.21	35.4	38.6	.32	.38	10.0	1.50	1.28	1.03	1.20	1.74	28.9	2.84	1550
D	22:51	1752.2	1750.5	1747.7	10.8	14.4	86	2520	16697	1943	35.9	1.20	1.20	35.6	38.8	.32	.38	11.3	1.34	1.28	1.03	1.20	1.74	29.9	2.95	1521
D	23: 0	1753.2	1751.5	1748.6	7.0	14.8	88	2520	16945	1926	36.1	1.20	1.20	36.2	39.3	.32	.38	12.5	1.46	1.28	1.03	1.20	1.74	30.9	3.09	1495
D	23: 6	1754.2	1752.5	1749.9	6.8	14.8	86	2520	17014	1942	37.9	1.20	1.20	35.7	39.3	.31	.38	8.7	1.48	1.28	1.03	1.20	1.74	31.9	3.21	1473
D	23:14	1755.2	1753.5	1750.8	7.1	14.1	85	2940	16945	1854	40.3	1.20	1.21	35.2	39.8	.31	.37	12.5	1.44	1.28	1.03	1.20	1.74	32.9	3.34	1451
D	23:23	1756.2	1754.5	1752.0	6.6	16.1	87	2730	17534	1873	43.2	1.20	1.21	34.8	39.7	.30	.37	12.5	1.43	1.28	1.03	1.20	1.74	33.9	3.48	1433
D	23:39	1757.2	1755.5	1753.5	11.6	.0	0	.000	-1055	0	50.4	1.20	1.21	35.0	39.4	.30	.36	17.5	1.38	1.29	1.03	1.20	1.74	34.9	3.65	1420
D	23:55	1758.2	1756.6	1755.3	5.5	10.9	84	2310	16107	1854	52.4	1.20	1.23	34.7	39.5	.30	.34	13.7	1.39	1.29	1.03	1.20	1.74	35.9	3.84	1400
D	0: 4	1759.2	1757.5	1756.3	5.6	12.3	82	2730	15983	1873	54.6	1.20	1.23	34.8	39.6	.30	.33	22.5	1.47	1.29	1.03	1.20	1.74	36.9	3.99	1395
D	0:20	1760.2	1758.5	1757.5	3.1	11.8	84	2730	15952	1854	54.4	1.20	1.23	35.8	39.7	.30	.33	2.5	1.49	1.29	1.03	1.20	1.74	37.9	4.25	1397
D	0:29	1761.2	1759.5	1758.1	7.2	14.3	81	3360	15952	1854	53.6	1.20	1.23	36.3	39.7	.30	.33	3.7	1.34	1.29	1.03	1.20	1.74	38.9	4.41	1385
D	0:43	1762.2	1760.5	1759.6	3.8	11.6	77	2940	15899	1854	52.2	1.20	1.23	37.1	40.0	.30	.33	3.7	1.44	1.29	1.03	1.20	1.74	39.9	4.62	1382
D	0:56	1763.2	1761.6	1760.5	6.8	13.8	0	-210	16262	1873	50.6	1.20	1.23	37.7	40.1	.29	.34	3.7	1.38	1.29	1.03	1.20	1.74	40.9	4.84	1380

ON-LINE TDC
GEOSERVICES BIT REPORT

\# 13/ 6/82 HAMMERHEAD #1

\#BIT HEADING :BIT#16 RUN#31
\#BIT TYPE :TOOTH
\#BIT IDENTITY :SEC S11
\#BIT SIZE : 8.50 INCH
\#BIT COST : 5000. $ RIG COST/HR: 5033.
\#NOZZLES : 12 12 12 /32NDS @ 95 % EFFICIENCY
\#DEPTH IN : 1722.21 METERS 12/ 6/82
\#DEPTH OUT : 1763.15 METERS 13/ 6/82
\#METRAGE : 40.94 METERS
\#TOTAL REVOLUTIONS : 23
\#DRILLING TIME: 4:51 HR AVERAGE ROP: 8.44 M/HR
\#TIME IN HOLE : 6: 0 HR AVERAGE ROP: 6.82 M/HR
\#TRIP TIME : 4: 0 HR
\#DRILLING COST STANDARD : 1547.4 $/MET
\#DRILLING COST ON BOTTOM : 1383.2 $/MET
\#DRILLING COST MINIMUM : 1380.5 $/MET

\# AVERAGE OVER THE RUN AVERAGE HYDRAULICS
\#WEIGHT ON BIT : 14.53 TONS NOZZLES SPEED : 151.38 M/S
\#ROTATION : 83.15 RPM PRESSURE DROP : 15217 KPA
\#FLOW RATE :1940.34 L/MN HYDRAULIC POWER: 660.80 H.P
\#STAND PIPE PRESSURE: 15764 KPA

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

* 13/ 6/82 TIME 2: 9 HAMMERHEAD #1

* DEPTH OF EXECUTION 1763.15 METERS
* FLOW RATE 1940 L/MN POWER LAW

MUD DATA	WEIGHT	1.20 SG
	PV	15 CPS
	YP	15.00 LB/FT2
	GEL	3.00 LB/100 FT2
	N	.6374
	K	.5869 LB/100 FT2
HOLES VOLUMES	WITH PIPES	72.70 M3
	WITHOUT PIPES	81.36 M3
	ANNULAR	57.51 M3
	INSIDE PIPES	15.18 M3

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						338	15				
DR.STRING	.00	1536.40	4.28	5.00		2050	89				
DR.STRING	1536.40	1592.10	3.00	5.00		407	18				
DR.STRING	1592.10	1765.44	2.81	6.59		1726	75				
BIT						15212	660	M/S		151.4	
ANNULUS	1763.15	1509.81		6.59	8.50	236	10	TU	1428.8	127.6	124.7
ANNULUS	1589.81	1534.11		5.00	8.50	17	1	TU	1732.1	81.0	78.4
ANNULUS	1534.11	1184.00		5.00	8.50	108	5	TU	1732.1	81.0	78.4
ANNULUS	1184.00	143.00		5.00	8.69	266	12	TU	1006.6	75.8	73.2
ANNULUS	143.00	.00		5.00	16.75	5	0	LA	5316.2	15.0	13.0
TOTAL						20365	883				

ANNULAR PRESSURE LOSSES 632 KPA

EQUIV.CIRCULATING DENSITY 1.24 SG
MAX DEPTH 5029.93

MUD LAG TIMES	S -> B	7.83 MN
	B -> S	29.65 MN
CUTTINGS DATA	SIZE	.20 CM
	DENSITY	2.40 SG
	LAG TIME	31.17 MN
	MAX SLIP VELOCITY	2.95 M/MN
BIT DATA	SIZE	8.50 INCH
	NOZZLES	12 12 12 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	15212 KPA
	H.H.P RATIO	74.70 %
	BIT H.H.P	11.625
	BIT VELOCITY	151.36 M/S

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

I3/ 6/82 — HAMMERHEAD #1

BIT#17 RUN#33 SEQ NBR: 0

STARTING DEPTH 1763.15 METERS

BIT DATA SIZE 8.50
TOOTH HTC JD8
NOZZLES 11 11 11 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	164	9.20	4.28	5.00	29.02
2	HEAVY WGT DP	1	55.70	3.00	5.00	73.00
3	DRILL COLLAR	1	174.38	2.81	6.50	136.40

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	8.69	143.00	1104.00
OPEN HOLE 1	8.50	1104.00	1763.11

COST DATA BIT COST 5000 $ RIG COST 5833 $/HR
TRIP TIME 6.00 HRS

WEIGHTS HOOK LOAD OFF BOTTON 104.4 TONS
STRING WEIGHT IN AIR 71.7 TONS

VOLUMES ANNULUS 57.5 M3 IN PIPES 15.2 M3

DEVIATION .5 DEG .873 M / 100 M

HYDRAULICS NOMINAL ANNULUS PRESSURE LOSSES AT 1600 L/MN : 13 KPA

BIT WEAR TYPE EXPONENT .5
EXPECTED: RUN LENGTH 150 METERS TEETH WEAR 3 /8TH

GEOSERVICES — HAMMERHEAD #1 — DATE : 13/ 6/02

ON-LINE TDC

BIT#17 RUN#33 HTC JD8 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 15 YP = 15 GEL = 3

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	ACCUMULATED ON BIT FRAC	METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/M
T	14:12	1763.2	1761.6	1761.1	----	----	0	.000	-1521	0	62.8	1.20	1.26	34.2	20.1	.30	.33	1.2	----------		----------		----------			
D	14:16	1764.5	1762.6	1761.4	15.5	3.2	0	.000	14276	1734	60.8	1.20	1.23	34.1	21.4	.31	.34	2.5	-.38	1.29	1.03	1.20	1.74	1.0	.04	39892
D	14:17	1767.1	1764.9	1761.4	244.	4.5	27	1890	15207	1716	60.4	1.20	1.23	34.0	22.1	.30	.33	2.5	.86	1.29	1.03	1.20	1.74	4.0	.05	9968
D	14:17	1768.2	1766.1	1761.4	286.	4.5	28	1680	17472	1716	60.6	1.20	1.23	33.9	22.3	.31	.33	2.5	.10	1.29	1.03	1.20	1.74	4.6	.06	8809
T	14:57	1763.8	1761.1	1763.0	----	----	84	2940	15003	1830	60.4	1.20	1.24	33.9	30.5	.31	.35	6.2	----------		----------		----------			
T	15:17	1764.3	1761.1	1763.0	----	----	89	2310	16697	1810	67.7	1.20	1.22	35.3	34.0	.30	.34	7.5	----------		----------		----------			
D	15:34	1765.1	1763.1	1763.9	3.3	14.6	80	2520	18031	1772	68.1	1.20	1.23	36.4	34.3	.30	.34	2.5	1.55	1.29	1.03	1.20	1.74	7.5	.67	5855
D	15:44	1766.1	1764.1	1764.2	6.5	14.8	81	2520	17969	1774	68.9	1.20	1.20	37.1	34.5	.30	.35	5.0	1.46	1.29	1.03	1.20	1.74	8.5	.84	5246
D	16: 2	1797.0	1764.6	1764.2	5.7	.0	0	.000	-1583	0	80.7	1.20	1.25	37.6	34.6	.30	.33	11.3	1.49	1.29	1.03	1.20	1.74	9.0	.92	5019
D	16:17	1769.3	1767.2	1765.1	15.3	14.7	76	2520	15641	1567	75.5	1.20	1.22	37.3	34.7	.29	.35	8.7	1.21	1.29	1.03	1.20	1.74	11.6	1.10	4804
D	16:21	1770.2	1768.2	1765.4	26.9	13.3	80	2520	16355	1661	76.1	1.20	1.23	37.3	34.6	.29	.35	8.7	1.06	1.29	1.29	1.20	1.85	12.6	1.16	3712
D	16:30	1771.1	1769.2	1766.3	40.4	15.5	80	2310	16262	1661	76.1	1.20	1.24	37.5	35.3	.29	.34	11.3	.90	1.29	1.03	1.20	1.74	13.6	1.30	3495
D	16:34	1772.1	1770.8	1766.6	23.4	12.4	82	2520	16324	1650	75.5	1.20	1.20	37.6	35.5	.29	.34	12.5	1.09	1.29	1.25	1.20	1.84	14.4	1.36	3314
D	16:36	1773.2	1771.3	1766.6	47.3	13.4	82	2310	16293	1661	74.9	1.20	1.27	37.7	35.4	.29	.34	12.5	.80	1.29	1.03	1.20	1.74	15.7	1.39	3074
T	16:56	1773.5	1771.6	1769.7	----	----	80	2520	15952	1661	74.9	1.20	1.22	38.4	35.5	.29	.34	8.7	----------		----------		----------			
T	17:16	1774.1	1772.8	1773.8	----	----	89	2310	16014	1661	77.5	1.20	1.21	39.0	34.5	.29	.35	13.7	----------		----------		----------			
D	17:17	1774.1	1772.8	1773.8	1.2	15.4	89	2520	15952	1661	77.7	1.20	1.22	39.0	34.6	.30	.34	13.7	1.93	1.29	1.03	1.20	1.74	16.4	1.05	3869
D	17:35	1775.2	1772.8	1773.3	18.8	15.1	86	2520	18497	1774	77.7	1.20	1.20	39.1	35.1	.29	.34	13.7	1.19	1.29	1.03	1.20	1.74	17.2	2.09	2992
D	17:50	1778.7	1773.3	1773.6	3.0	.0	0	.000	-1614	0	79.3	1.20	1.23	39.1	35.3	.29	.33	13.7	1.64	1.29	1.03	1.20	1.74	17.7	2.22	2957

ON-LINE TDC
GEOSERVICES BIT REPORT

* 13/ 6/82 HAMMERHEAD #1

*BIT HEADING :BIT#17 RUN#33
*BIT TYPE :TOOTH
*BIT IDENTITY :HTC JD8

*BIT SIZE : 8.50 INCH
*BIT COST : 5000. $ RIG COST/HR: 5033.

*NOZZLES : 11 11 11 /32NDS @ 95 % EFFICIENCY

*DEPTH IN : 1761.02 METERS 13/ 6/82
*DEPTH OUT : 1778.68 METERS 13/ 6/82
*METRAGE : 17.65 METERS
*TOTAL REVOLUTIONS : 10

*DRILLING TIME: 2:13 HR AVERAGE ROP: 7.94 M/HR
*TIME IN HOLE : 2:48 HR AVERAGE ROP: 6.30 M/HR
*TRIP TIME : 6: 0 HR

*DRILLING COST STANDARD : 3191.2 $/MET
*DRILLING COST ON BOTTOM : 2999.8 $/MET
*DRILLING COST MINIMUM : 2956.9 $/MET

AVERAGE OVER THE RUN		AVERAGE HYDRAULICS	
*WEIGHT ON BIT	: 11.68 TONS	NOZZLES SPEED	: 156.52 M/S
*ROTATION	: 62.93 RPM	PRESSURE DROP	: 16267 KPA
*FLOW RATE	:1685.72 L/MN	HYDRAULIC POWER:	612.95 H.P
*STAND PIPE PRESSURE:	16017 KPA		

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

13/ 6/82 — HAMMERHEAD #1

BIT#18 RUN#34 SEQ NBR: 0

STARTING DEPTH 1778.60 METERS

BIT DATA SIZE 8.50
TOOTH HTC J7
NOZZLES 11 11 11 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	165	9.20	4.28	5.00	29.02
2	HEAVY WGT DP	1	55.70	3.00	5.00	73.00
3	DRILL COLLAR	1	174.30	2.81	6.50	136.40

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	8.69	143.00	1104.00
OPEN HOLE 1	8.50	1104.00	1775.16

COST DATA BIT COST 5000 $ RIG COST 5033 $/HR
TRIP TIME 6.00 HRS

WEIGHTS HOOK LOAD OFF BOTTOM 104.6 TONS
STRING WEIGHT IN AIR 72.0 TONS

VOLUMES ANNULUS 57.9 M3 IN PIPES 15.3 M3

DEVIATION .5 DEG .873 M / 100 M

HYDRAULICS NOMINAL ANNULUS PRESSURE LOSSES AT 1600 L/MN : 13 KPA

BIT WEAR TYPE EXPONENT .5
EXPECTED: RUN LENGTH 150 METERS TEETH WEAR 3 /8TH

GEOSERVICES — HAMMERHEAD $1 — DATE : 14/ 6/82

ON-LINE TDC

BIT#18 RUN#34 HTC J7 — BIT DIAMETER : 8.50 inch — NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 14 YP = 20 GEL = 3

	TIME	DEPTHS MEASURED	VERTCL	LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	ACCUMULATED ON BIT FRAC	METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	Nm	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
T	0:22	1778.7	1773.3	1773.6	----	----	84	2730	10279	1734	71.1	1.20	1.22	33.1	29.1	.30	.35	-2.5								
D	0:37	1779.1	1777.1	1778.5	21.5	11.1	81	2520	10031	1716	69.7	1.20	1.21	32.9	30.4	.30	.34	-1.2	1.01	1.29	1.34	1.20	1.87	3.9	.07	10413
D	0:43	1780.1	1777.9	1778.5	7.5	12.5	80	2520	10031	1744	67.6	1.20	1.21	32.6	31.9	.30	.33	-1.2	1.39	1.29	1.03	1.20	1.74	4.6	.18	8811
D	0:45	1781.1	1778.7	1778.5	23.1	11.6	82	2310	10000	1716	66.2	1.20	1.22	32.6	32.2	.30	.33	-1.2	1.05	1.29	1.30	1.20	1.86	5.5	.21	7499
D	0:49	1782.1	1779.9	1778.5	17.9	12.9	82	2520	10000	1716	62.4	1.20	1.23	32.6	33.0	.30	.34	-2.5	1.06	1.29	1.29	1.20	1.85	6.7	.27	6220
D	0:52	1783.1	1781.1	1778.5	18.4	11.1	66	2520	16510	1809	61.6	1.20	1.23	32.6	32.4	.30	.37	-1.2	1.16	1.29	1.03	1.20	1.74	7.8	.32	5326
D	0:54	1784.2	1782.8	1778.8	39.8	12.2	80	2520	10000	1716	67.4	1.20	1.22	32.8	31.4	.30	.36	.0	.92	1.29	1.03	1.20	1.74	8.8	.36	4795
D	0:57	1785.1	1783.1	1778.8	25.5	11.6	79	2310	10031	1734	74.1	1.20	1.22	32.9	31.9	.30	.35	-2.5	1.02	1.29	1.33	1.20	1.87	9.9	.40	4290
D	0:59	1786.1	1783.9	1778.8	19.2	11.5	86	2310	10000	1749	77.3	1.20	1.21	33.1	32.5	.30	.35	-3.7	1.11	1.29	1.24	1.20	1.83	10.7	.44	3977
D	1: 1	1787.1	1785.1	1779.1	27.0	10.7	86	2310	10062	1746	76.1	1.20	1.23	33.2	32.6	.30	.35	-5.0	1.01	1.29	1.34	1.20	1.88	11.9	.47	3601
D	1:16	1788.2	1786.3	1779.7	24.5	11.5	87	2520	15083	1569	80.3	1.20	1.22	33.8	30.5	.30	.34	-1.2	1.05	1.29	1.30	1.20	1.86	13.1	.54	3306
D	1:19	1789.1	1787.1	1779.7	20.3	12.2	86	2310	15083	1587	77.3	1.20	1.23	33.8	30.4	.30	.35	-1.2	1.11	1.29	1.23	1.20	1.83	13.9	.58	3123
D	1:32	1790.1	1787.9	1780.0	3.1	14.2	82	2310	17410	1681	73.7	1.20	1.24	34.5	31.9	.30	.33	-2.5	1.64	1.29	1.03	1.20	1.75	14.7	.82	3022
T	1:52	1790.9	1788.7	1788.0	----	----	93	2100	15486	1625	73.3	1.20	1.23	35.3	32.2	.30	.34	-1.2								
D	1:56	1791.1	1789.1	1788.9	2.1	14.5	91	2310	15903	1625	73.1	1.20	1.23	35.4	32.4	.30	.35	-1.2	1.73	1.29	1.03	1.20	1.75	15.9	1.21	2955
D	2:10	1792.1	1789.9	1790.1	4.0	14.0	91	2100	15903	1660	72.5	1.20	1.22	35.8	32.3	.30	.35	-1.2	1.64	1.29	1.03	1.20	1.75	16.6	1.43	2892
D	2:13	1793.1	1791.1	1790.1	20.4	15.4	93	2520	15238	1640	72.7	1.20	1.23	35.8	32.3	.30	.34	-1.2	1.19	1.30	1.03	1.20	1.75	17.9	1.48	2723
D	2:16	1794.2	1791.9	1790.1	20.1	13.2	94	2310	15703	1660	72.1	1.20	1.21	35.9	32.1	.30	.35	-1.2	1.18	1.30	1.03	1.20	1.75	18.7	1.53	2615
D	2:18	1795.1	1793.2	1790.4	27.3	12.3	93	2310	15766	1660	71.9	1.20	1.23	36.0	32.3	.30	.34	-1.2	1.05	1.30	1.30	1.20	1.86	19.9	1.58	2470
D	2:30	1796.2	1794.3	1790.7	22.5	4.1	91	2100	16417	1643	75.3	1.20	1.26	36.1	31.9	.30	.35	.0	1.05	1.30	1.30	1.20	1.86	21.1	1.63	2349
D	2:33	1797.1	1795.1	1790.7	31.4	13.6	88	2310	16479	1643	73.5	1.20	1.24	36.2	31.8	.30	.35	-2.5	1.00	1.30	1.36	1.20	1.80	21.8	1.69	2277
D	2:36	1798.2	1795.9	1791.0	19.4	15.3	92	2520	16231	1643	72.1	1.20	1.23	36.2	32.8	.30	.35	-1.2	1.15	1.30	1.03	1.20	1.75	22.7	1.74	2208
D	2:39	1799.1	1797.1	1791.0	18.7	15.1	87	2310	16293	1663	71.9	1.20	1.23	36.3	32.2	.30	.34	-1.2	1.17	1.30	1.03	1.20	1.75	23.9	1.79	2112
D	2:48	1800.2	1798.0	1791.6	7.9	14.7	88	2310	16107	1643	71.7	1.20	1.23	36.4	32.3	.30	.34	-1.2	1.43	1.30	1.03	1.20	1.75	24.7	1.93	2055
D	2:53	1801.2	1799.2	1792.8	15.6	14.1	87	2310	15859	1713	71.7	1.20	1.24	36.4	32.2	.30	.35	-1.2	1.22	1.30	1.03	1.20	1.75	25.9	2.02	1997
D	2:56	1802.1	1799.9	1793.8	21.0	14.4	90	2310	16231	1660	71.5	1.20	1.23	36.5	32.1	.30	.35	-1.2	1.15	1.30	1.03	1.20	1.75	26.6	2.06	1948
D	2:58	1803.2	1801.2	1794.4	30.4	15.1	86	2310	15820	1643	71.3	1.20	1.24	36.5	32.3	.30	.35	-1.2	1.02	1.30	1.34	1.20	1.80	27.9	2.09	1870
D	3: 0	1804.1	1801.9	1795.0	23.3	12.6	89	2310	15331	1643	71.7	1.20	1.23	36.5	32.5	.30	.35	-1.2	1.09	1.30	1.27	1.20	1.85	28.7	2.13	1826
D	3:12	1805.9	1804.0	1796.5	35.0	14.1	98	2520	15579	1623	72.7	1.20	1.23	36.7	32.4	.30	.35	-1.2	.94	1.30	1.03	1.20	1.75	30.8	2.19	1714
D	3:13	1806.2	1804.0	1796.8	35.0	13.6	97	2310	14710	1643	72.3	1.20	1.23	36.7	32.5	.30	.35	-1.2	.94	1.30	1.03	1.20	1.75	30.8	2.20	1714
D	3:16	1807.1	1805.2	1797.7	29.5	14.4	89	2310	14586	1625	71.3	1.20	1.25	36.7	32.7	.30	.35	-1.2	1.00	1.30	1.03	1.20	1.75	31.9	2.25	1663
D	3:19	1808.1	1806.0	1798.6	27.1	14.6	89	2310	15455	1640	70.9	1.20	1.25	36.7	32.7	.31	.35	-1.2	1.06	1.30	1.29	1.20	1.86	32.7	2.30	1629
D	3:23	1809.1	1807.1	1799.5	18.4	14.5	90	2100	14772	1625	70.7	1.20	1.23	36.7	32.9	.30	.35	-3.7	1.29	1.30	1.03	1.20	1.75	33.9	2.37	1587
D	3:27	1810.1	1807.9	1799.8	10.1	13.7	89	2310	14617	1625	70.3	1.20	1.22	36.8	32.5	.30	.35	-1.2	1.35	1.30	1.03	1.20	1.75	34.7	2.44	1562
D	3:31	1811.1	1809.2	1800.2	12.2	13.7	88	2310	15176	1625	70.3	1.20	1.23	36.8	32.7	.30	.35	-2.5	1.27	1.30	1.03	1.20	1.75	35.9	2.50	1519
D	3:35	1812.2	1810.0	1801.7	11.7	13.1	87	2310	14214	1625	70.1	1.20	1.22	36.9	32.8	.30	.36	-1.2	1.27	1.30	1.03	1.20	1.75	36.8	2.57	1494
D	3:40	1813.1	1811.1	1803.5	7.6	14.5	88	2310	14617	1620	69.7	1.20	1.23	36.9	32.5	.30	.35	-2.5	1.40	1.30	1.03	1.20	1.75	37.9	2.65	1464
D	3:44	1814.1	1811.9	1804.7	23.3	15.6	90	2310	15021	1607	69.9	1.20	1.24	37.0	33.0	.30	.34	-1.2	1.06	1.30	1.29	1.20	1.86	38.7	2.72	1441
D	3:47	1815.3	1813.3	1804.7	19.6	13.5	85	1470	14338	1615	69.7	1.20	1.22	37.0	33.0	.30	.35	-1.2	1.11	1.30	1.24	1.20	1.84	40.1	2.77	1408
D	4: 4	1816.1	1813.9	1808.1	13.8	13.1	92	2310	14617	1625	69.9	1.20	1.26	37.1	32.3	.30	.36	-2.5	1.17	1.30	1.03	1.20	1.75	40.7	2.87	1388
D	4:11	1817.1	1815.1	1809.3	10.4	13.8	92	2310	14648	1595	65.6	1.20	1.24	37.1	33.2	.30	.35	-2.5	1.33	1.30	1.03	1.20	1.75	41.9	2.98	1368
D	4:19	1818.1	1815.9	1811.4	6.8	15.5	92	2310	13430	1625	64.2	1.20	1.23	37.1	33.6	.31	.35	-1.2	1.46	1.30	1.03	1.20	1.75	42.7	3.10	1356
D	4:27	1819.1	1817.1	1813.0	6.9	14.9	91	2310	14066	1590	64.2	1.20	1.23	37.2	33.5	.31	.34	-1.2	1.43	1.30	1.03	1.20	1.75	43.9	3.23	1340
D	4:35	1820.1	1817.9	1815.1	6.4	15.3	94	2100	14369	1607	63.6	1.20	1.23	37.4	33.2	.31	.35	-1.2	1.45	1.30	1.03	1.20	1.75	44.7	3.37	1332
D	4:48	1821.1	1819.1	1815.7	17.2	15.1	92	2310	14990	1607	63.6	1.20	1.21	37.4	33.8	.31	.35	-1.2	1.17	1.30	1.03	1.20	1.75	45.9	3.46	1310
D	4:47	1822.1	1819.9	1816.3	9.6	16.1	92	2310	14431	1625	64.0	1.20	1.23	37.5	33.2	.31	.35	-3.7	1.35	1.30	1.03	1.20	1.75	46.7	3.57	1298
D	4:54	1823.1	1821.1	1817.5	9.2	14.3	91	2310	14431	1607	64.2	1.20	1.23	37.6	33.5	.31	.35	-2.5	1.35	1.30	1.03	1.20	1.75	47.9	3.70	1285
D	4:58	1824.1	1821.9	1818.1	14.2	14.2	90	2310	14028	1607	66.0	1.20	1.23	37.6	33.5	.31	.35	-3.7	1.25	1.30	1.03	1.20	1.75	48.7	3.75	1270
D	5:14	1825.1	1823.2	1819.4	21.0	13.8	84	2310	16510	1683	68.3	1.20	1.25	37.6	33.5	.31	.35	-2.5	1.07	1.30	1.29	1.20	1.86	49.9	3.85	1251

GEOSERVICES — HAMMERHEAD #1 — DATE : 14/ 6/82

BIT#18 RUN#34 HTC J7 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 14 YP = 20 GEL = 3

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	net	net	net	m/hr	ton	rpm	Nm	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	net	DHr	$/m
D	5:17	1826.2	1823.9	1820.8	29.8	15.1	83	2310	16479	1681	68.3	1.20	1.23	37.7	33.8	.31	.35	-5.6	.98	1.30	1.03	1.20	1.75	50.7	3.89	1235
D	5:22	1827.2	1825.1	1820.9	7.2	13.7	86	2310	16306	1719	67.7	1.20	1.23	37.7	34.4	.31	.35	-3.7	1.36	1.30	1.03	1.20	1.75	51.9	3.98	1218
T	5:43	1827.9	1825.9	1824.2	——	——	87	2100	16634	1681	67.7	1.20	1.23	38.2	35.3	.31	.36	-3.7	——	——	——	——	——	——	——	——
D	5:50	1828.1	1825.9	1824.5	1.7	16.7	86	2100	15083	1713	67.6	1.20	1.22	38.4	35.7	.31	.35	-3.7	1.00	1.30	1.03	1.20	1.75	52.7	4.44	1231
T	6:10	1828.6	1826.3	1827.6	——	——	90	2100	14920	1698	68.3	1.21	1.25	39.1	35.8	.31	.36	-2.5	——	——	——	——	——	——	——	——

ON-LINE TDC
GEOSERVICES BIT REPORT

14/ 6/82 HAMMERHEAD #1

#BIT HEADING :BIT#18 RUN#34
#BIT TYPE :TOOTH
#BIT IDENTITY :HTC J7

#BIT SIZE : 8.50 INCH
#BIT COST : 5000. $ RIG COST/HR: 5033.

#NOZZLES : 11 11 11 /32NDS @ 95 % EFFICIENCY

#DEPTH IN : 1778.49 METERS 13/ 6/82
#DEPTH OUT : 1828.71 METERS 14/ 6/82
#METRAGE : 50.22 METERS
#TOTAL REVOLUTIONS : 26

#DRILLING TIME: 4:53 HR AVERAGE ROP: 10.28 M/HR
#TIME IN HOLE : 5:43 HR AVERAGE ROP: 8.79 M/HR
#TRIP TIME : 6: 0 HR

#DRILLING COST STANDARD : 1468.1 $/MET
#DRILLING COST ON BOTTOM : 1364.1 $/MET
#DRILLING COST MINIMUM : 1249.2 $/MET

AVERAGE OVER THE RUN AVERAGE HYDRAULICS
#WEIGHT ON BIT : 14.31 TONS NOZZLES SPEED : 151.67 M/S
#ROTATION : 87.99 RPM PRESSURE DROP : 15402 KPA
#FLOW RATE :1633.50 L/MN HYDRAULIC POWER: 582.38 H.P
#STAND PIPE PRESSURE: 15444 KPA

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

14/ 6/82 TIME 6:23

HAMMERHEAD #1

DEPTH OF EXECUTION 1826.71 METERS
FLOW RATE 1716 L/MN

POWER LAW

MUD DATA	WEIGHT	1.21 SG
	PV	14 CPS
	YP	16.00 LB/FT2
	GEL	2.00 LB/100 FT2
	N	.5850
	K	.7292 LB/100 FT2
HOLES VOLUMES	WITH PIPES	74.06 M3
	WITHOUT PIPES	03.76 M3
	ANNULAR	59.07 M3
	INSIDE PIPES	15.70 M3

	FROM	TO	PIPE ID	PIPE OD	HOLE DIAM	P.LOSSES	H.P	TYPE	CRITICAL FLOW	MUD VELOCITY	CUTTINGS VELOCITY
	METERS		INCH	INCH	INCH	KPA			L/MN	M/MN	M/MN
SURF.EQPT						269	10				
DR.STRING	.00	1600.00	4.28	5.00		1700	65				
DR.STRING	1600.00	1656.50	3.00	5.00		324	12				
DR.STRING	1656.50	1830.00	2.81	6.50		1382	53				
BIT						16997	652	M/S		159.3	
ANNULUS	1826.71	1654.33		6.50	8.50	189	7	TU	1489.2	112.9	110.1
ANNULUS	1654.33	1598.63		5.00	8.50	22	1	LA	1861.0	71.7	69.2
ANNULUS	1598.63	1184.00		5.00	8.50	162	6	LA	1861.0	71.7	69.2
ANNULUS	1184.00	143.00		5.00	8.69	363	14	LA	1946.7	67.0	64.6
ANNULUS	143.00	.00		5.00	16.75	5	0	LA	6101.2	13.3	12.3
TOTAL						21413	821				

ANNULAR PRESSURE LOSSES 740 KPA

EQUIV.CIRCULATING DENSITY 1.25 SG
MAX DEPTH 4975.26

MUD LAG TIMES	S -> B	9.28 MN
	B -> S	34.43 MN
CUTTINGS DATA	SIZE	.20 CM
	DENSITY	2.40 SG
	LAG TIME	36.14 MN
	MAX SLIP VELOCITY	2.83 M/MN
BIT DATA	SIZE	8.50 INCH
	NOZZLES	11 11 11 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	16997 KPA
	H.H.P RATIO	79.38 %
	BIT H.H.P	11.489
	BIT VELOCITY	159.33 M/S

GEOSERVICES — HAMMERHEAD #1 — DATE : 14/ 6/92

ON-LINE TDC

BIT#18 RUN#34 HTC J7 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 14 YP = 16 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	6:27	1829.8	1827.9	1827.9	5.1	16.2	87	2100	17131	1716	68.1	1.21	1.23	39.6	35.8	.31	.35	-3.7	1.49	1.31	1.03	1.21	1.75	51.4	4.91	1336
D	6:38	1830.1	1827.9	1828.2	7.2	15.6	87	2100	17317	1716	68.5	1.21	1.24	39.7	35.7	.31	.35	-2.5	1.42	1.31	1.03	1.21	1.75	51.4	5.09	1335
T	6:58	1830.6	1828.3	1828.5	----	----	87	2100	14493	1698	68.3	1.21	1.23	39.9	36.5	.31	.35	-5.0	----		----	----	----	----	----	----
T	7:18	1831.0	1829.1	1830.0	----	----	88	2100	16231	1716	67.6	1.21	1.23	40.3	36.5	.31	.35	-5.0	----		----	----	----	----	----	----
D	7:24	1831.1	1829.1	1830.0	1.3	15.5	89	2100	16200	1736	67.2	1.21	1.23	40.4	36.5	.31	.36	-2.5	1.89	1.31	1.03	1.21	1.75	52.6	5.85	1396
T	7:44	1831.4	1829.5	1830.6	----	----	88	2100	18124	1851	67.0	1.21	1.23	40.8	37.2	.31	.35	-5.0	----		----	----	----	----	----	----
T	8: 4	1831.8	1829.9	1830.9	----	----	86	2100	18310	1810	66.2	1.21	1.24	41.2	37.7	.31	.35	-5.0	----		----	----	----	----	----	----
D	8:13	1832.2	1829.9	1830.9	1.0	16.5	87	2100	17659	1886	66.4	1.21	1.24	41.3	37.8	.31	.36	-2.5	1.99	1.31	1.03	1.21	1.75	53.4	6.49	1441
T	8:33	1832.4	1830.3	1831.5	----	----	84	1890	18341	1830	66.0	1.21	1.22	41.7	37.9	.31	.35	-3.7	----		----	----	----	----	----	----
T	8:53	1833.0	1831.1	1832.2	----	----	86	2100	15672	1848	65.2	1.21	1.24	42.0	38.4	.31	.36	-5.0	----		----	----	----	----	----	----
D	8:56	1833.1	1831.1	1832.2	1.9	17.2	85	2100	18217	1838	64.8	1.21	1.23	42.0	38.2	.31	.36	-3.7	1.82	1.31	1.03	1.21	1.75	54.6	7.21	1496
T	9:16	1833.5	1831.5	1832.5	----	----	0	.000	-1738	0	64.8	1.21	1.22	42.4	39.2	.31	.36	-5.0	----		----	----	----	----	----	----
T	9:36	1833.7	1831.5	1832.8	----	----	83	2100	16759	1754	64.2	1.21	1.22	42.5	38.4	.31	.35	-5.0	----		----	----	----	----	----	----
D	9:52	1834.1	1832.0	1833.4	1.1	13.1	82	2100	16759	1754	65.0	1.21	1.23	42.6	39.3	.31	.35	-5.0	1.84	1.31	1.03	1.21	1.75	55.4	7.98	1542
T	10:12	1834.7	1832.0	1833.7	----	----	0	.000	3079	1201	66.0	1.21	1.24	42.8	39.1	.31	.34	-2.5	----		----	----	----	----	----	----
T	10:32	1834.7	1832.0	1833.7	----	----	0	.000	-1000	0	62.2	1.21	1.25	42.6	37.0	.31	.35	-1.2	----		----	----	----	----	----	----

ON-LINC TDC
GEOSERVICES BIT REPORT

14/ 6/82 HAMMERHEAD #1

*BIT HEADING :BIT#18 RUN#34
*BIT TYPE :TOOTH
*BIT IDENTITY :HTC J7
*BIT SIZE : 8.50 INCH
*BIT COST : 5000. $ RIG COST/HR: 5833.
*NOZZLES : 11 11 11 /32NDS @ 95 % ETTICIENCY
*DEPTH IN : 1778.41 METERS 13/ 6/82
*DEPTH OUT : 1834.66 METERS 14/ 6/82
*METRAGE : 56.25 METERS
*TOTAL REVOLUTIONS : 43
*DRILLING TIME: 8:14 HR AVERAGE ROP: 6.84 M/HR
*TIME IN HOLE : 9:59 HR AVERAGE ROP: 5.64 M/HR
*TRIP TIME : 6: 0 HR
*DRILLING COST STANDARD : 1746.0 $/MET
*DRILLING COST ON BOTTOM : 1564.5 $/MET
*DRILLING COST MINIMUM : 1249.2 $/MET

AVERAGE OVER THE RUN		AVERAGE HYDRAULICS	
*WEIGHT ON BIT	: 13.50 TONS	NOZZLES SPEED	: 155.92 M/S
*ROTATION	: 89.29 RPM	PRESSURE DROP	: 16276 KPA
*FLOW RATE	:1679.23 L/MN	HYDRAULIC POWER	: 610.95 H.P
*STAND PIPE PRESSURE:	15920 KPA		

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

14/ 6/82 TIME 10:53

HAMMERHEAD #1

DEPTH OF EXECUTION 1834.66 METERS

FLOW RATE 1600 L/MN

POWER LAW

MUD DATA	WEIGHT	1.21 SG
————	PV	14 CPS
	YP	16.00 LB/FT2
	GEL	2.00 LB/100 FT2
	N	.5850
	K	.7292 LB/100 FT2
HOLES VOLUMES	WITH PIPES	75.09 M3
————	WITHOUT PIPES	83.90 M3
	ANNULAR	59.22 M3
	INSIDE PIPES	15.87 M3

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						259	10				
DR.STRING	.00	1610.00	4.28	5.00		1646	62				
DR.STRING	1610.00	1665.70	3.00	5.00		312	12				
DR.STRING	1665.70	1840.98	2.81	6.50		1331	50				
BIT						16291	612	M/S		156.0	
ANNULUS	1834.66	1660.28		6.50	8.50	102	7	TU	1489.2	110.5	107.7
ANNULUS	1660.28	1604.58		5.00	8.50	22	1	LA	1861.0	70.2	67.7
ANNULUS	1604.58	1184.00		5.00	8.50	163	6	LA	1861.0	70.2	67.7
ANNULUS	1184.00	143.00		5.00	8.69	359	13	LA	1946.7	65.6	63.2
ANNULUS	143.00	.00		5.00	16.75	5	0	LA	6101.2	13.0	12.0
TOTAL						20568	772				

ANNULAR PRESSURE LOSSES 729 KPA

EQUIV.CIRCULATING DENSITY 1.25 SG

MAX DEPTH 5415.03

MUD LAG TIMES	S -> B	9.45 MN
————	B -> S	35.25 MN
CUTTINGS DATA	SIZE	.20 CM
————	DENSITY	2.40 SG
	LAG TIME	37.04 MN
	MAX SLIP VELOCITY	2.02 M/MN
BIT DATA	SIZE	8.50 INCH
————	NOZZLES	11 11 11 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	16291 KPA
	H.H.P RATIO	79.20 %
	BIT H.H.P	10.701
	BIT VELOCITY	155.99 M/S

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

14/ 6/82 TIME 17: 9 HAMMERHEAD #1

DEPTH OF EXECUTION 1841.13 METERS
FLOW RATE 1830 L/MN POWER LAW

MUD DATA	WEIGHT	1.21 SG
-------	PV	15 CPS
	YP	15.09 LB/FT2
	GEL	2.00 LB/100 FT2
	N	.6189
	K	.5900 LB/100 FT2
HOLES VOLUMES	WITH PIPES	75.33 M3
------------	WITHOUT PIPES	04.22 M3
	ANNULAR	59.37 M3
	INSIDE PIPES	15.95 M3

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						307	13				
DR.STRING	.00	1619.20	4.28	5.00		1958	80				
DR.STRING	1619.20	1674.90	3.00	5.00		369	15				
DR.STRING	1674.90	1849.28	2.81	6.50		1574	64				
BIT						19335	791	M/S		169.9	
ANNULUS	1841.13	1666.75		6.50	8.50	215	9	TU	1469.7	120.4	117.5
ANNULUS	1666.75	1611.05		5.00	8.50	16	1	TU	1801.3	76.4	73.9
ANNULUS	1611.05	1184.00		5.00	8.50	119	5	TU	1801.3	76.4	73.9
ANNULUS	1184.00	143.00		5.00	8.69	359	15	LA	1880.7	71.5	69.0
ANNULUS	143.00	.00		5.00	16.75	4	0	LA	5662.1	14.1	13.0
TOTAL						24256	992				

ANNULAR PRESSURE LOSSES 713 KPA

EQUIV.CIRCULATING DENSITY 1.25 SG
MAX DEPTH 3755.47

MUD LAG TIMES	S -) B	8.72 MN
------------	B -) S	32.44 MN

CUTTINGS DATA	SIZE	.20 CM
------------	DENSITY	2.40 SG
	LAG TIME	34.07 MN
	MAX SLIP VELOCITY	2.86 M/MN

BIT DATA	SIZE	8.50 INCH
--------	NOZZLES	11 11 11 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	19335 KPA
	H.H.P RATIO	79.71 %
	BIT H.H.P	13.940
	BIT VELOCITY	169.94 M/S

GEOSERVICES — HAMMERHEAD #1 — DATE : 14/ 6/02

ON-LINE TDC

BIT#19 RUN#35 HTC J3 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 14 YP = 16 GEL = 2

	TIME	MEASURED DEPTHS	VERTCL	LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	DENSITY IN	DENSITY OUT	MUD PARAMETERS TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	16:26	1836.0	1834.1	1833.7	189.	48.2	79	2940	15052	1868	63.2	1.21	1.22	35.1	22.5	.33	.34	.0	.25	1.31	1.03	1.21	1.75	1.3	.00	29856
D	16:28	1836.1	1834.1	1834.0	189.	16.5	79	2730	15052	1774	63.8	1.21	1.23	35.0	23.3	.33	.33	2.5	.25	1.31	1.03	1.21	1.75	1.3	.02	29856
D	16:37	1837.1	1835.1	1835.8	5.6	14.8	80	2520	14710	1705	64.6	1.21	1.21	34.0	31.6	.33	.34	3.7	1.56	1.31	1.03	1.21	1.75	2.4	.17	17221
D	16:42	1838.2	1835.9	1835.8	11.7	15.4	79	2520	14803	1762	64.0	1.21	1.21	33.6	33.7	.33	.37	1.2	1.31	1.31	1.03	1.21	1.75	3.2	.26	13111
D	16:46	1839.1	1837.1	1836.1	9.0	15.5	79	2730	14928	1774	64.2	1.21	1.23	33.6	33.8	.33	.35	3.7	1.37	1.31	1.03	1.21	1.75	4.4	.33	9614
D	16:58	1840.2	1837.9	1836.1	4.1	16.1	79	2520	14803	1795	68.3	1.21	1.23	34.2	34.5	.33	.36	3.7	1.62	1.31	1.03	1.21	1.75	5.2	.52	8299
D	17: 8	1841.1	1839.2	1836.1	5.8	13.2	91	2310	10714	1830	67.0	1.21	1.22	35.1	33.9	.31	.37	5.8	1.53	1.31	1.03	1.21	1.76	6.4	.68	6849

GEOSERVICES — HAMMERHEAD #1 — DATE : 14/ 6/02

ON-LINE TDC

BIT#19 RUN#35 HTC J3 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 15 YP = 15 GEL = 2

	TIME	MEASURED DEPTH	VERTCL DEPTH	LAGGED DEPTH	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	17:21	1842.2	1839.9	1838.9	4.7	14.5	92	2310	18106	1737	74.5	1.21	1.22	36.1	33.9	.31	.36	.0	1.55	1.31	1.03	1.21	1.76	7.2	.90	6237
T	17:41	1843.0	1840.7	1840.1	——	——	83	2310	15517	1734	85.5	1.21	1.20	36.3	33.6	.31	.37	10.0	——	——	——	——	——	——	——	——
D	17:47	1843.1	1841.1	1840.7	2.7	16.8	86	2310	16726	1683	83.5	1.21	1.20	36.3	33.4	.30	.37	-3.7	1.75	1.31	1.03	1.21	1.76	8.4	1.15	5569
D	17:54	1844.1	1842.0	1841.0	11.2	17.9	82	2310	16130	1662	84.7	1.21	1.20	36.3	34.3	.30	.37	-2.5	1.30	1.31	1.03	1.21	1.76	9.3	1.26	5092
D	18: 5	1845.1	1843.1	1841.9	6.0	17.8	83	2310	16479	1662	84.7	1.21	1.20	36.5	34.3	.30	.36	6.2	1.55	1.31	1.03	1.21	1.76	10.4	1.44	4656
D	18: 8	1846.1	1843.9	1842.2	25.2	17.0	84	2310	16448	1662	83.9	1.21	1.20	36.6	34.1	.30	.37	7.5	1.12	1.31	1.24	1.21	1.84	11.2	1.50	4360
D	18:21	1847.1	1845.2	1842.8	4.2	15.9	82	2310	15983	1663	82.5	1.21	1.21	37.1	33.5	.30	.36	7.5	1.62	1.31	1.03	1.21	1.76	12.4	1.70	4020
D	18:33	1848.1	1845.9	1844.3	5.6	15.3	86	2730	15424	1662	82.7	1.21	1.21	37.6	33.3	.30	.35	7.5	1.52	1.31	1.03	1.21	1.76	13.2	1.91	3853
D	18:45	1849.1	1847.1	1845.9	4.8	16.1	83	2310	15579	1660	83.1	1.21	1.19	38.0	33.7	.29	.35	7.5	1.55	1.31	1.03	1.21	1.76	14.4	2.11	3633
D	18:58	1850.1	1847.9	1846.8	4.6	16.8	83	2310	15734	1660	82.3	1.21	1.20	38.2	34.0	.29	.35	7.5	1.58	1.31	1.03	1.21	1.76	15.2	2.31	3498
D	19: 9	1851.1	1849.2	1848.0	4.8	16.7	89	2310	15703	1662	82.5	1.21	1.21	38.4	34.9	.29	.37	6.2	1.58	1.31	1.03	1.21	1.76	16.4	2.51	3326
D	19:11	1852.1	1850.0	1848.0	45.4	15.1	86	2520	15610	1662	82.1	1.21	1.24	38.4	35.0	.29	.35	7.5	.90	1.31	1.03	1.21	1.76	17.3	2.53	3172
D	19:24	1854.1	1851.8	1848.3	148.	6.6	49	1680	14928	1625	85.3	1.21	1.23	38.6	34.8	.29	.37	7.5	.31	1.31	1.03	1.21	1.76	19.0	2.55	2886
D	19:25	1854.1	1852.2	1848.6	238.	16.6	0	-210	14897	1625	84.7	1.21	1.20	38.5	35.0	.29	.36	6.2	.21	1.31	1.03	1.21	1.76	19.4	2.55	2821
T	19:45	1853.0	1852.5	1850.1	——	——	1	1260	14400	1624	79.9	1.21	1.18	39.0	37.2	.28	.34	7.5	——	——	——	——	——	——	——	——
T	20: 5	1854.9	1854.1	1853.2	——	——	21	840.	15083	1621	81.5	1.21	1.23	39.9	37.1	.27	.35	6.2	——	——	——	——	——	——	——	——
D	20: 6	1855.1	1854.5	1854.1	13.5	14.4	77	2310	14772	1624	81.3	1.21	1.22	40.0	37.0	.27	.33	7.5	1.00	1.31	1.03	1.21	1.76	21.7	2.68	2557
D	20: 9	1856.2	1855.3	1852.9	21.0	14.1	84	2310	15114	1658	81.3	1.21	1.17	40.1	37.0	.27	.34	6.2	1.09	1.31	1.20	1.21	1.86	22.5	2.73	2477
D	20:12	1857.1	1856.6	1852.9	15.1	14.0	79	2310	15145	1624	81.7	1.21	1.21	40.3	36.9	.27	.35	5.0	1.16	1.31	1.20	1.21	1.83	23.8	2.78	2358
D	20:15	1858.1	1857.3	1852.9	19.9	14.7	78	2520	15207	1607	81.3	1.21	1.25	40.3	36.9	.28	.35	3.7	1.07	1.31	1.30	1.21	1.87	24.5	2.83	2299
D	20:18	1859.2	1858.5	1852.9	23.9	14.5	88	2520	15238	1644	81.7	1.21	1.19	40.4	36.8	.27	.35	5.0	1.05	1.31	1.32	1.21	1.80	25.8	2.88	2202
D	20:23	1860.1	1859.3	1852.9	8.9	15.4	76	2730	15300	1624	81.7	1.21	1.21	40.5	37.4	.28	.34	7.5	1.31	1.31	1.03	1.21	1.76	26.5	2.96	2155
D	20:27	1861.3	1860.7	1852.9	17.7	13.2	75	.000	15145	1624	81.9	1.21	1.24	40.7	37.4	.27	.34	6.2	1.08	1.31	1.29	1.21	1.86	28.0	3.02	2060
D	20:30	1862.2	1860.7	1852.9	17.7	.0	0	-210	14866	1624	81.3	1.21	1.16	40.6	37.3	.27	.35	6.2	1.08	1.31	1.29	1.21	1.86	28.0	3.02	2060
D	20:43	1863.1	1862.5	1853.5	10.0	15.1	80	2520	16440	1731	81.5	1.21	1.23	41.1	36.0	.27	.34	5.0	1.23	1.32	1.03	1.21	1.76	29.0	3.11	1951
D	20:51	1864.1	1863.3	1855.9	11.3	15.0	75	2310	16355	1681	79.1	1.21	1.25	41.1	37.3	.27	.33	7.5	1.23	1.32	1.03	1.21	1.76	30.6	3.24	1916
D	20:57	1865.2	1864.5	1858.1	10.3	15.6	78	2520	16262	1681	80.3	1.21	1.25	41.2	37.6	.27	.32	7.5	1.26	1.32	1.03	1.21	1.76	31.7	3.34	1871
D	21: 6	1866.2	1865.3	1860.5	8.1	14.9	79	2310	16107	1681	80.9	1.21	1.24	41.3	37.8	.27	.32	6.2	1.33	1.32	1.03	1.21	1.76	32.6	3.48	1841
D	21:12	1867.1	1866.5	1862.8	14.8	13.6	79	2520	16200	1698	80.1	1.21	1.26	41.4	37.8	.27	.32	6.2	1.11	1.32	1.25	1.21	1.85	33.8	3.58	1801
D	21:16	1868.1	1867.3	1862.8	12.7	13.6	78	2310	16169	1711	78.7	1.21	1.23	41.4	37.5	.28	.32	7.5	1.15	1.32	1.22	1.21	1.84	34.5	3.64	1771
D	21:21	1869.1	1868.5	1862.9	13.3	12.2	79	2520	16076	1711	79.5	1.21	1.21	41.5	37.6	.28	.33	6.2	1.13	1.32	1.24	1.21	1.85	35.8	3.73	1725
D	21:28	1870.1	1869.3	1863.9	7.8	10.9	80	2310	15952	1693	77.1	1.21	1.20	41.5	37.7	.28	.32	6.2	1.17	1.32	1.03	1.21	1.76	36.5	3.84	1701
T	21:48	1870.2	1869.3	1865.7	——	——	0	.000	-1707	0	81.5	1.21	1.24	41.7	38.2	.27	.29	10.0	——	——	——	——	——	——	——	——
D	21:49	1871.4	1870.8	1865.7	360.	3.8	0	.000	-1769	0	80.9	1.21	1.22	41.7	38.2	.27	.29	10.0	-.07	1.32	1.03	1.21	1.76	38.1	3.85	1641
T	22: 9	1871.5	1870.9	1865.7	——	——	0	.000	-1738	0	78.7	1.21	1.18	41.5	38.2	.27	.27	10.0	——	——	——	——	——	——	——	——
T	22:29	1871.5	1870.9	1865.7	——	——	0	.000	-1730	0	77.7	1.21	1.27	41.3	38.0	.27	.27	10.0	——	——	——	——	——	——	——	——
D	22:41	1872.1	1871.3	1866.0	4.3	10.7	75	2520	14400	1678	81.1	1.21	1.24	41.2	28.2	.27	.35	6.2	.94	1.32	1.03	1.21	1.76	38.6	3.98	1635
D	22:47	1873.2	1872.5	1867.2	12.9	11.7	75	2520	15841	1643	81.7	1.21	1.24	41.1	31.4	.27	.30	7.5	1.07	1.32	1.31	1.21	1.87	39.8	4.07	1601
D	22:53	1874.1	1873.3	1868.7	11.3	14.2	76	2520	16231	1676	81.3	1.21	1.23	40.8	35.2	.27	.29	7.5	1.09	1.32	1.20	1.21	1.86	40.5	4.18	1584
D	22:57	1875.1	1874.5	1869.0	19.9	13.6	75	2730	16355	1681	80.9	1.21	1.24	40.5	35.6	.28	.31	6.2	.98	1.32	1.03	1.21	1.76	41.8	4.23	1547
D	23: 6	1876.1	1875.3	1870.8	8.8	12.8	76	2520	16355	1681	81.1	1.21	1.23	40.1	36.5	.27	.31	5.0	1.24	1.32	1.03	1.21	1.76	42.5	4.38	1536
D	23:13	1877.1	1876.5	1870.3	10.2	10.5	77	2310	16324	1699	79.3	1.21	1.23	39.9	36.7	.27	.32	6.2	1.14	1.32	1.23	1.21	1.84	43.7	4.50	1515
D	23:21	1878.1	1877.3	1872.4	8.6	10.4	76	2310	16417	1714	79.1	1.21	1.22	39.9	37.6	.27	.32	6.2	1.17	1.32	1.03	1.21	1.76	44.6	4.63	1498
D	23:32	1879.2	1878.5	1873.6	9.0	12.0	76	2310	16138	1684	78.9	1.21	1.22	40.1	37.6	.27	.33	3.7	1.15	1.32	1.22	1.21	1.84	45.7	4.76	1480
D	23:40	1880.1	1879.3	1875.1	6.3	10.4	70	2310	16231	1699	75.5	1.21	1.23	40.3	37.8	.27	.33	3.7	1.25	1.32	1.03	1.21	1.76	46.5	4.90	1469
D	23:53	1881.4	1880.8	1876.8	53.6	2.4	86	2100	16479	1736	76.7	1.19	1.20	40.5	37.6	.27	.32	8.7	.43	1.32	1.03	1.20	1.76	48.0	4.98	1436
D	23:57	1882.1	1881.3	1877.8	9.8	10.5	88	2310	17131	1754	74.1	1.19	1.20	40.5	37.5	.27	.33	6.2	1.14	1.32	1.23	1.20	1.84	48.5	5.05	1428
D	0: 3	1883.1	1882.5	1877.9	9.5	10.5	86	2310	15424	1691	73.9	1.19	1.20	40.9	37.2	.27	.32	6.2	1.16	1.32	1.21	1.20	1.84	49.8	5.15	1406
D	0: 9	1884.2	1883.3	1878.5	9.0	10.9	87	2310	15424	1681	73.3	1.19	1.20	41.1	37.9	.28	.32	7.5	1.16	1.32	1.20	1.20	1.83	50.5	5.25	1394

GEOSERVICES
ON-LINE TDC

HAMMERHEAD #1

DATE : 15/ 6/82

BIT#19 RUN#35 HTC J3 BIT DIAMETER : 8.50 inch NOZZ 11/11/11

MUD RHEOLOGICAL PARAMETERS : PV = 15 YP = 15 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit		sg	sg	sg	met	DHr	$/m
D	0:21	1885.1	1884.5	1888.0	2.9	12.4	86	2310	14431	1661	72.9	1.19	1.20	41.4	38.2	.28	.32	6.2	1.50	1.32	1.03	1.20	1.76	51.7	5.45	1385
D	0:26	1886.1	1885.3	1888.6	20.5	12.4	87	2310	14617	1666	72.7	1.19	1.20	41.6	38.0	.28	.32	7.5	.98	1.32	1.03	1.20	1.76	52.5	5.53	1372
D	0:30	1887.1	1886.5	1889.9	19.6	11.2	87	2310	14710	1670	72.3	1.19	1.20	41.7	38.1	.28	.32	7.5	1.00	1.32	1.03	1.20	1.76	53.7	5.59	1350
D	0:38	1888.1	1887.3	1892.4	6.3	13.1	87	2310	14506	1670	72.5	1.19	1.20	41.8	38.2	.28	.33	6.2	1.31	1.32	1.03	1.20	1.76	54.5	5.73	1342
D	0:47	1889.2	1888.5	1894.8	7.8	11.1	87	2310	14462	1660	73.7	1.19	1.19	41.9	38.5	.28	.33	6.2	1.22	1.32	1.03	1.20	1.76	55.8	5.87	1329
D	0:58	1890.2	1889.3	1894.9	6.4	8.7	86	2310	12941	1696	72.9	1.19	1.20	42.1	38.4	.28	.33	6.2	1.27	1.32	1.03	1.20	1.76	56.5	6.05	1326
D	1:16	1891.1	1890.6	1897.3	19.3	9.2	87	2310	13872	1670	73.5	1.19	1.20	42.4	38.8	.29	.33	5.0	1.14	1.32	1.24	1.20	1.85	57.8	6.20	1317
D	1:25	1892.2	1891.3	1898.5	9.4	9.9	88	2100	14524	1732	73.5	1.19	1.23	42.4	38.5	.29	.33	5.0	1.13	1.32	1.24	1.20	1.85	58.6	6.34	1309
D	1:31	1893.2	1892.5	1899.2	12.1	9.5	88	2310	13934	1757	73.5	1.19	1.19	42.5	38.7	.29	.33	6.2	1.09	1.32	1.29	1.20	1.87	59.8	6.44	1296
D	1:36	1894.1	1893.3	1899.8	11.8	11.3	88	2310	14214	1727	73.5	1.19	1.20	42.6	38.5	.29	.33	6.2	1.12	1.32	1.26	1.20	1.86	60.6	6.52	1286
D	1:44	1895.1	1894.5	1900.1	9.6	11.9	82	3570	14400	1737	73.1	1.19	1.19	42.7	38.7	.29	.33	5.0	1.17	1.32	1.28	1.20	1.83	61.8	6.65	1274
D	1:50	1896.1	1895.3	1900.1	13.0	11.7	86	2310	15021	1737	73.1	1.19	1.19	42.7	38.9	.29	.33	3.7	1.11	1.32	1.26	1.20	1.86	62.6	6.76	1266

GEOSERVICES — HAMMERHEAD #1 — DATE : 15/ 6/82

BIT#19 RUN#35 HTC J3 — BIT DIAMETER : 8.50 inch — NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 16 YP = 15 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	DRILLING PARAMETERS ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	2: 0	1898.2	1897.7	1892.8	4.8	10.4	87	2310	13003	1569	72.3	1.19	1.19	42.0	36.5	.28	.33	3.7	1.33	1.33	1.03	1.20	1.77	64.9	7.04	1240
D	2:15	1899.1	1898.5	1894.0	5.9	10.6	88	2310	13190	1569	72.7	1.19	1.20	42.0	36.3	.28	.33	5.0	1.27	1.33	1.03	1.20	1.77	65.8	7.16	1243
D	2:32	1900.2	1899.3	1895.9	10.0	12.7	86	2310	13717	1587	76.9	1.19	1.19	42.5	36.3	.28	.34	5.0	.89	1.33	1.03	1.20	1.77	66.5	7.29	1236
D	2:41	1901.1	1900.5	1897.1	6.5	11.2	87	2310	13717	1607	74.5	1.19	1.19	42.3	35.2	.28	.32	3.7	1.20	1.33	1.03	1.20	1.77	67.7	7.42	1228
D	2:50	1902.1	1901.3	1897.7	5.5	11.6	87	2100	13438	1615	74.3	1.19	1.18	42.0	35.4	.28	.31	2.5	1.31	1.33	1.03	1.20	1.77	68.5	7.58	1225
D	3: 1	1903.2	1902.5	1899.2	6.6	11.7	87	2100	13376	1625	75.5	1.19	1.18	41.5	35.4	.28	.32	3.7	1.28	1.33	1.03	1.20	1.77	69.8	7.76	1220
D	3:11	1904.2	1903.3	1899.8	5.7	11.7	88	2100	13003	1623	76.3	1.19	1.19	41.2	35.4	.28	.32	3.7	1.32	1.33	1.03	1.20	1.77	70.5	7.93	1218
D	3:19	1905.2	1904.5	1900.7	10.6	11.6	84	2310	12134	1607	78.1	1.19	1.18	41.0	35.5	.28	.32	3.7	1.15	1.33	1.22	1.28	1.85	71.7	8.06	1213
D	3:26	1906.1	1905.3	1902.0	8.6	13.0	87	2310	13003	1607	76.5	1.19	1.18	40.9	35.4	.28	.33	2.5	1.23	1.33	1.03	1.20	1.77	72.5	8.22	1206
D	3:35	1907.1	1906.5	1902.3	10.2	13.4	85	2310	13376	1590	73.1	1.19	1.18	40.7	35.8	.28	.33	2.5	1.20	1.33	1.03	1.20	1.77	73.7	8.32	1200
D	3:42	1908.2	1907.3	1903.2	7.7	12.1	86	2310	12879	1607	72.1	1.19	1.18	40.7	35.7	.28	.32	3.7	1.24	1.33	1.03	1.20	1.77	74.5	8.45	1194
T	4: 2	1909.1	1908.5	1904.7	----	----	91	2100	13072	1570	68.1	1.19	1.18	40.5	35.3	.28	.33	3.7	----		----			----		
D	4: 3	1909.2	1908.5	1904.7	7.8	11.0	91	2100	13872	1562	68.1	1.19	1.18	40.5	35.3	.28	.33	3.7	1.22	1.33	1.03	1.20	1.77	75.7	8.65	1192
D	4: 9	1910.1	1909.3	1905.6	8.4	11.6	89	2310	14245	1542	68.3	1.19	1.18	40.4	35.4	.28	.33	3.7	1.22	1.33	1.03	1.20	1.77	76.5	8.76	1187
D	4:15	1911.1	1910.5	1906.2	9.9	11.6	89	3150	13655	1560	71.1	1.19	1.17	40.3	35.2	.28	.34	2.5	1.19	1.33	1.03	1.20	1.77	77.7	8.85	1178
D	4:21	1912.2	1911.3	1907.4	9.3	11.6	89	2520	13810	1542	71.3	1.19	1.18	40.3	35.1	.28	.33	1.2	1.16	1.33	1.22	1.20	1.84	78.6	8.96	1173

ON-LINE TDC
GEOSERVICES — HYDRAULIC REPORT

15/ 6/82 TIME 4:24 — HAMMERHEAD #1

DEPTH OF EXECUTION 1912.49 METERS
FLOW RATE 1542 L/MN — POWER LAW

MUD DATA	WEIGHT	1.19	SG
	PV	16	CPS
	YP	15.00	LB/FT2
	GEL	2.00	LB/100 FT2
	N	.6339	
	K	.5567	LB/100 FT2
HOLES VOLUMES	WITH PIPES	77.63	M3
	WITHOUT PIPES	86.03	M3
	ANNULAR	61.08	M3
	INSIDE PIPES	16.55	M3

	FROM	TO	PIPE ID	PIPE OD	HOLE DIAM	P.LOSSES	H.P	TYPE	CRITICAL FLOW	MUD VELOCITY	CUTTINGS VELOCITY
	METERS		INCH	INCH	INCH	KPA			L/MN	M/MN	M/MN
SURF.EQPT						226	0				
DR.STRING	.00	1683.60	4.28	5.00		1500	32				
DR.STRING	1683.60	1739.30	3.00	5.00		272	9				
DR.STRING	1739.30	1913.68	2.01	6.50		1160	40				
BIT						13555	467	M/S		143.2	
ANNULUS	1912.49	1738.11		6.50	8.50	159	5	TU	1512.5	101.4	98.6
ANNULUS	1738.11	1682.41		5.00	8.50	20	1	LA	1037.4	64.4	61.9
ANNULUS	1682.41	1184.00		5.00	8.50	178	6	LA	1037.4	64.4	61.9
ANNULUS	1184.00	143.00		5.00	8.69	330	11	LA	1916.8	60.2	57.8
ANNULUS	143.00	.00		5.00	16.75	4	0	LA	5665.7	11.9	10.8
TOTAL						17484	600				

ANNULAR PRESSURE LOSSES 691 KPA

EQUIV.CIRCULATING DENSITY 1.23 SG
MAX DEPTH 7496.67

MUD LAG TIMES	S -) B	10.73	MN
	B -) S	39.61	MN
CUTTINGS DATA	SIZE	.20	CM
	DENSITY	2.40	SG
	LAG TIME	41.94	MN
	MAX SLIP VELOCITY	2.81	M/MN
BIT DATA	SIZE	8.50	INCH
	NOZZLES	11 11 11	/32NDS
	NOZZLES EFFICIENCY	95	%
	BIT P. LOSSES	13555	KPA
	H.H.P RATIO	77.89	%
	BIT H.H.P	8.234	
	BIT VELOCITY	143.18	M/S

GEOSERVICES — HAMMERHEAD #1 — DATE : 15/ 6/82

ON-LINE TDC

BIT#19 RUN#35 HTC J3 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 16 YP = 15 GEL = 2

			DEPTHS			DRILLING PARAMETERS						MUD PARAMETERS						GAS	OVERPRESSURE SURVEY					ACCUMULATED ON BIT		
	TIME	MEASURED	VERTCL	LAGGED	ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT		DCS	NORM	PF	ECD	FRAC	METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	4:29	1913.1	1912.6	1908.1	6.1	12.3	89	2100	13606	1560	68.9	1.19	1.18	40.2	35.3	.28	.33	2.5	1.33	1.33	1.03	1.20	1.77	79.8	9.09	1165
D	4:38	1914.2	1913.3	1908.4	6.4	11.5	89	2730	12220	1560	69.7	1.19	1.18	40.1	35.0	.28	.34	3.7	1.33	1.33	1.03	1.20	1.77	80.5	9.24	1163
D	4:44	1915.1	1914.5	1909.0	9.9	11.6	89	2520	12631	1560	70.1	1.19	1.18	40.1	35.0	.28	.33	3.7	1.20	1.33	1.03	1.20	1.77	81.0	9.34	1155
D	4:58	1916.2	1915.3	1909.9	10.3	12.5	89	2730	12041	1562	70.1	1.19	1.18	40.1	34.8	.28	.32	3.7	1.20	1.33	1.03	1.20	1.77	82.6	9.44	1150
D	5: 6	1917.2	1916.6	1911.7	13.6	-.2	62	1890	13531	1569	72.3	1.19	1.18	40.0	34.6	.28	.33	6.2	1.09	1.33	1.29	1.20	1.80	83.9	9.54	1140
D	5:13	1918.2	1917.3	1912.9	11.9	14.6	83	2940	13934	1598	69.7	1.19	1.18	40.0	35.0	.28	.33	5.0	1.15	1.33	1.23	1.20	1.85	84.5	9.67	1138
D	5:18	1919.2	1918.5	1913.5	13.8	13.2	87	2730	13624	1587	69.3	1.19	1.18	40.0	35.1	.29	.33	5.0	1.13	1.33	1.25	1.20	1.86	85.0	9.75	1129
D	5:22	1920.1	1919.3	1913.8	12.6	13.3	85	2520	13469	1597	69.3	1.19	1.18	39.9	35.0	.28	.34	5.0	1.16	1.33	1.22	1.20	1.85	86.5	9.82	1123
D	5:27	1921.1	1920.5	1914.5	11.8	12.8	87	3150	13430	1587	69.1	1.19	1.18	40.0	34.8	.28	.33	5.0	1.16	1.33	1.22	1.20	1.84	87.8	9.90	1113

ON-LINE TDC
GEOSERVICES BIT REPORT

* 15/ 6/82 HAMMERHEAD #1

*BIT HEADING :BIT#19 RUN#35
*BIT TYPE :TOOTH
*BIT IDENTITY :HTC J3

*BIT SIZE : 8.50 INCH
*BIT COST : 5000. $ RIG COST/HR: 5833.

*NOZZLES : 11 11 11 /32NDS @ 95 % EFFICIENCY

*DEPTH IN : 1833.45 METERS 14/ 6/82
*DEPTH OUT : 1921.20 METERS 15/ 6/82
*METRAGE : 87.75 METERS
*TOTAL REVOLUTIONS : 49

*DRILLING TIME: 9:55 HR AVERAGE ROP: 8.85 M/HR
*TIME IN HOLE : 13: 6 HR AVERAGE ROP: 6.70 M/HR
*TRIP TIME : 6: 0 HR

*DRILLING COST STANDARD : 1326.7 $/MET
*DRILLING COST ON BOTTOM : 1114.7 $/MET
*DRILLING COST MINIMUM : 1113.4 $/MET

* AVERAGE OVER THE RUN AVERAGE HYDRAULICS
*WEIGHT ON BIT : 12.70 TONS NOZZLES SPEED : 152.27 M/S
*ROTATION : 82.00 RPM PRESSURE DROP : 15332 KPA
*FLOW RATE :1640.00 L/MN HYDRAULIC POWER: 562.07 H.P
*STAND PIPE PRESSURE: 15550 KPA

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

15/ 6/82 — HAMMERHEAD #1

BIT#20 RUN#36 SEQ NBR: 0

STARTING DEPTH 1921.20 METERS

BIT DATA SIZE 8.50
TOOTH HTC J3
NOZZLES 11 11 11 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	183	9.20	4.28	5.00	29.02
2	HEAVY WGT DP	1	55.70	3.00	5.00	73.00
3	DRILL COLLAR	1	174.38	2.81	6.50	136.40

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	8.69	143.00	1184.00
OPEN HOLE 1	8.50	1184.00	1921.04

COST DATA BIT COST 5000 $ RIG COST 5833 $/HR
TRIP TIME 6.00 HRS

WEIGHTS HOOK LOAD OFF BOTTOM 108.7 TONS
STRING WEIGHT IN AIR 76.8 TONS

VOLUMES ANNULUS 61.3 M3 IN PIPES 16.6 M3

DEVIATION 1.0 DEG 1.75 M / 100 M

HYDRAULICS NOMINAL ANNULUS PRESSURE LOSSES AT 1600 L/MN : 13 KPA

BIT WEAR TYPE EXPONENT .5
EXPECTED: RUN LENGTH 150 METERS TEETH WEAR 3 /8TH

GEOSERVICES — HAMMERHEAD #1 — DATE : 15/ 6/82

ON-LINE TDC

BIT#2@ RUN#36 HTC J3 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 16 YP = 15 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
T	11:53	1921.2	1920.5	1915.7	----	----	0	-210	11940	967	67.9	1.19	1.19	34.2	30.9	.30	.32	.0	----------	----------	----------	----------	----------	----------	----------	----------
T	12:13	1922.0	1921.4	1855.9	----	----	77	2730	13810	1607	67.4	1.19	1.19	33.6	33.3	.30	.33	3.7	----------	----------	----------	----------	----------	----------	----------	----------
D	12:14	1922.2	1921.4	1856.2	9.1	13.4	76	2730	13810	1607	67.2	1.19	1.19	33.6	33.3	.30	.33	2.5	1.35	1.33	1.03	1.20	1.77	.9	.09	46524
D	12:19	1923.2	1922.6	1856.8	11.3	15.0	72	2730	13872	1605	67.9	1.19	1.19	33.6	33.8	.30	.34	.0	1.29	1.33	1.03	1.20	1.77	2.1	.18	19520
D	12:25	1924.1	1923.4	1857.5	12.2	15.2	72	4200	14059	1625	68.7	1.19	1.18	33.9	33.5	.30	.35	-1.2	1.31	1.33	1.03	1.20	1.77	2.9	.27	14220
D	12:33	1925.1	1924.6	1859.0	12.6	12.7	77	2730	13810	1607	69.5	1.19	1.16	34.4	32.7	.30	.37	-21.	1.28	1.33	1.03	1.20	1.77	4.1	.39	10346
D	12:50	1926.1	1925.5	1864.2	14.9	15.1	79	2940	13810	1605	69.9	1.19	1.18	35.5	33.1	.30	.34	-2.5	1.25	1.33	1.03	1.20	1.77	5.8	.52	8514
D	12:56	1927.1	1926.6	1869.6	10.5	11.5	89	3150	13779	1595	69.7	1.19	1.18	35.8	33.1	.30	.35	-1.2	1.28	1.33	1.03	1.20	1.77	6.1	.60	7131
D	13: 1	1928.1	1927.4	1922.7	12.5	11.2	93	2730	13593	1607	70.1	1.19	1.18	36.2	32.8	.30	.34	-2.5	1.20	1.33	1.03	1.20	1.77	6.9	.70	6375
D	13: 7	1929.1	1928.6	1923.6	8.2	11.1	89	2730	13593	1605	70.3	1.19	1.20	36.4	32.4	.30	.35	.0	1.31	1.33	1.03	1.20	1.77	8.1	.79	5522
D	13:13	1930.1	1929.4	1924.2	9.9	10.9	89	2520	13531	1597	70.9	1.19	1.18	36.8	32.1	.30	.35	-1.2	1.28	1.33	1.03	1.20	1.77	8.9	.89	5043
D	13:20	1931.1	1930.6	1925.4	7.3	12.1	91	2730	13562	1625	70.9	1.19	1.18	37.0	32.4	.30	.35	-1.2	1.37	1.33	1.03	1.20	1.77	10.1	1.01	4551
D	13:25	1932.1	1931.4	1926.0	14.4	11.3	89	2520	13469	1643	71.1	1.19	1.18	37.0	32.3	.30	.35	-1.2	1.21	1.34	1.03	1.20	1.77	10.9	1.09	4233
D	13:32	1933.1	1932.6	1926.3	8.5	12.2	87	3150	13500	1622	71.1	1.19	1.18	37.2	32.4	.30	.36	-1.2	1.31	1.34	1.03	1.20	1.77	12.1	1.21	3893
D	13:38	1934.1	1933.4	1927.6	9.2	10.8	88	3360	13531	1638	71.5	1.19	1.18	37.3	32.5	.30	.36	-2.5	1.33	1.34	1.03	1.20	1.77	12.9	1.30	3687
D	13:47	1936.4	1933.8	1928.5	7.5	.8	71	2520	13376	1584	73.7	1.19	1.18	37.3	32.6	.30	.35	1.2	1.34	1.34	1.03	1.20	1.77	13.3	1.35	3595
D	13:52	1937.2	1936.6	1929.1	7.8	10.4	93	2520	14400	1643	71.9	1.19	1.18	32.0	32.7	.30	.36	-2.5	1.33	1.34	1.03	1.20	1.77	16.1	1.42	3004

GEOSERVICES — HAMMERHEAD #1 — DATE : 15/ 6/82

ON-LINE TDC

BIT#20 RUN#36 HTC J3 BIT DIAMETER : 8.50 inch NOZZ 11/11/11 — MUD RHEOLOGICAL PARAMETERS : PV = 16 YP = 9 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		deqC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	14: 1	1938.2	1937.4	1938.6	3.0	8.5	115	2730	13966	1663	71.9	1.19	1.17	32.0	32.8	.30	.34	-2.5	1.48	1.34	1.03	1.20	1.77	16.9	1.50	2880
D	14: 5	1939.6	1939.1	1931.2	86.8	8.5	114	2520	13717	1600	71.9	1.19	1.18	32.0	32.6	.31	.34	-1.2	.71	1.34	1.03	1.20	1.77	18.6	1.56	2638
D	14: 8	1940.2	1939.4	1931.8	7.4	7.8	115	2730	13655	1600	72.1	1.19	1.18	32.0	-.0	.31	.36	-1.2	1.29	1.34	1.03	1.20	1.77	18.9	1.61	2612
D	14:18	1941.1	1940.6	1933.7	5.6	9.6	113	5460	13717	1660	72.1	1.19	1.18	32.0	32.4	.31	.35	-1.2	1.39	1.34	1.03	1.20	1.77	20.1	1.70	2507
T	14:38	1941.6	1941.0	1937.6	----	----	75	2100	9869	1192	74.5	1.19	1.19	32.0	33.7	.31	.34	-1.2	----	----	----	----	----	----	----	----
T	14:58																									
T	16:10	1942.2	1941.4	1941.9	----	----	2	1050	12079	1597	67.4	1.19	1.18	33.3	35.3	.31	.35	-2.5	----	----	----	----	----	----	----	----

ON-LINE TDC
GEOSERVICES BIT REPORT

\# 15/ 6/82 HAMMERHEAD #1

#BIT HEADING :BIT#20 RUN#36
#BIT TYPE :TOOTH
#BIT IDENTITY :HTC J3

#BIT SIZE : 8.50 INCH
#BIT COST : 5000. $ RIG COST/HR: 5033.

#NOZZLES : 11 11 11 /32NDS @ 95 % EFFICIENCY

#DEPTH IN : 1921.20 METERS 15/ 6/82
#DEPTH OUT : 1942.10 METERS 15/ 6/82
#METRAGE : 20.90 METERS
#TOTAL REVOLUTIONS : 12

#DRILLING TIME: 2:20 HR AVERAGE ROP: 8.49 M/HR
#TIME IN HOLE : 4:21 HR AVERAGE ROP: 4.80 M/HR
#TRIP TIME : 6: 0 HR

#DRILLING COST STANDARD : 3128.7 $/MET
#DRILLING COST ON BOTTOM : 2600.8 $/MET
#DRILLING COST MINIMUM : 2402.2 $/MET

# AVERAGE OVER THE RUN		AVERAGE HYDRAULICS	
#WEIGHT ON BIT	: 11.80 TONS	NOZZLES SPEED	: 150.42 M/S
#ROTATION	: 89.00 RPM	PRESSURE DROP	: 14960 KPA
#FLOW RATE	:1620.00 L/MN	HYDRAULIC POWER:	541.75 H.P

#STAND PIPE PRESSURE: 13700 KPA

ON-LINE TDC
GEOSERVICES — HYDRAULIC REPORT

15/ 6/82 TIME 17:55 — HAMMERHEAD #1

DEPTH OF EXECUTION 1942.18 METERS
FLOW RATE 1620 L/MN — POWER LAW

MUD DATA	WEIGHT	1.19 SG
----------	PV	16 CPS
	YP	9.00 LB/FT2
	GEL	2.00 LB/100 FT2
	N	.7618
	K	.1988 LB/100 FT2
HOLES VOLUMES	WITH PIPES	78.68 M3
----------	WITHOUT PIPES	87.92 M3
	ANNULAR	61.79 M3
	INSIDE PIPES	16.89 M3

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						247	9				
DR.STRING	.00	1720.40	4.28	5.00		1675	61				
DR.STRING	1720.40	1776.10	3.00	5.00		297	11				
DR.STRING	1776.10	1950.48	2.81	6.50		1267	46				
BIT						14960	542	H/S		158.4	
ANNULUS	1942.18	1767.80		6.50	8.50	173	6	TU	1185.2	106.6	103.5
ANNULUS	1767.80	1712.10		5.00	8.50	12	0	TU	1322.9	67.7	64.8
ANNULUS	1712.10	1184.00		5.00	8.50	118	4	TU	1322.9	67.7	64.8
ANNULUS	1184.00	143.00		5.00	8.69	194	7	TU	1369.1	63.3	68.4
ANNULUS	143.00	.00		5.00	16.75	3	0	LA	3396.2	12.5	10.2
TOTAL						18948	686				

ANNULAR PRESSURE LOSSES 501 KPA

EQUIV.CIRCULATING DENSITY 1.22 SG
MAX DEPTH 6704.65

MUD LAG TIMES	S -> B	10.43 MN
----------	B -> S	38.14 MN

CUTTINGS DATA	SIZE	.20 CM
----------	DENSITY	2.40 SG
	LAG TIME	41.91 MN
	MAX SLIP VELOCITY	3.12 M/MN

BIT DATA	SIZE	8.50 INCH
--------	NOZZLES	11 11 11 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	14960 KPA
	H.H.P RATIO	78.95 %
	BIT H.H.P	9.547
	BIT VELOCITY	150.42 M/S

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

15/ 6/02 — HAMMERHEAD #1

BIT#21 RUN#37 SEQ NBR: 0

STARTING DEPTH 1942.18 METERS

BIT DATA SIZE 8.50
INSERT HTC J33
NOZZLES 12 12 12 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	186	9.20	4.28	5.00	29.02
2	HEAVY WGT DP	1	55.70	3.00	5.00	73.00
3	DRILL COLLAR	1	174.30	2.81	6.50	136.40

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	8.69	143.00	1184.00
OPEN HOLE 1	8.50	1184.00	1942.20

COST DATA BIT COST 8000 $ — RIG COST 5833 $/HR
TRIP TIME 6.00 HRS

WEIGHTS HOOK LOAD OFF BOTTOM 189.4 TONS
STRING WEIGHT IN AIR 77.6 TONS

VOLUMES ANNULUS 61.8 M3 IN PIPES 16.8 M3

DEVIATION 1.0 DEG 1.75 M / 100 M

HYDRAULICS NOMINAL ANNULUS PRESSURE LOSSES AT 1600 L/MN : 13 KPA

BIT WEAR TYPE EXPONENT .2
EXPECTED: RUN LENGTH 150 METERS TEETH WEAR 3 /OTH

GEOSERVICES — HAMMERHEAD #1 — DATE : 15/ 6/82

ON-LINE TDC

BIT#21 RUN#37 HTC JJJ — BIT DIAMETER : 8.50 inch — NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 16 YP = 9 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	DRILLING PARAMETERS ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	Hr	$/m
D	22:39	1948.0	1947.4	1941.9	38.9	.0	56	2730	10521	1868	67.9	1.19	1.18	27.7	32.8	.32	.37	-6.2	.72	1.34	1.03	1.20	1.78	.0	.00	7230
D	23: 0	1944.1	1943.0	1946.8	5.9	13.5	57	2520	12587	1939	66.2	1.19	1.17	28.7	32.9	.32	.37	-21.	1.39	1.34	1.03	1.20	1.77	1.8	.20	24641
D	23: 6	1945.9	1943.0	1946.5	5.9	13.1	59	2520	15176	2017	67.0	1.19	1.18	29.1	33.3	.32	.37	-15.	1.39	1.34	1.03	1.20	1.77	1.8	.30	24641
D	23: 7	1946.1	1945.0	1946.5	16.0	12.8	62	2520	14741	2032	66.2	1.19	1.18	29.2	33.2	.32	.36	-11.	1.13	1.34	1.26	1.20	1.87	3.8	.33	11776
D	23:15	1947.1	1946.0	1946.5	7.2	12.8	62	2310	14121	2037	65.0	1.19	1.17	29.9	33.2	.32	.37	-7.5	1.36	1.34	1.03	1.20	1.78	4.8	.46	9492
D	23:21	1948.1	1947.0	1946.5	9.9	13.5	63	2310	13469	2017	64.6	1.19	1.18	30.4	33.3	.32	.39	-6.2	1.28	1.34	1.03	1.20	1.78	5.8	.56	7932
D	23:31	1949.1	1948.0	1946.5	8.1	13.6	63	2310	13997	2052	64.0	1.19	1.18	31.0	33.4	.33	.37	-2.5	1.35	1.34	1.03	1.20	1.78	6.8	.71	6907
T	23:51	1949.6	1948.5	1947.7	----	----	62	2310	3383	2345	65.2	1.19	1.18	31.8	33.8	.33	.36	-5.8	----		----			----		
T	0:11	1950.0	1948.5	1949.2	----	----	69	2310	13997	2025	64.8	1.19	1.18	32.8	33.6	.34	.37	-5.8	----		----			----		
D	0:29	1950.1	1949.0	1949.5	.9	12.4	61	2100	12414	1975	63.6	1.19	1.18	32.3	34.3	.33	.38	-3.7	1.87	1.34	1.03	1.20	1.78	2.8	1.62	6636
T	0:49	1950.6	1949.5	1949.8	----	----	58	2310	12910	1995	62.6	1.19	1.17	32.6	35.0	.33	.37	-5.8	----		----			----		
D	1: 0	1951.1	1950.0	1950.1	1.5	17.4	58	2310	12290	1975	63.0	1.19	1.18	33.1	35.4	.34	.38	-8.7	1.90	1.34	1.03	1.20	1.78	8.8	2.27	6344
T	1:28	1951.6	1950.5	1950.7	----	----	57	2310	14493	1975	61.8	1.19	1.18	33.5	35.9	.32	.38	-8.7	----		----			----		
D	1:40	1952.1	1951.0	1951.0	2.5	16.7	56	2310	13376	1995	62.0	1.19	1.17	33.7	35.9	.33	.36	-6.2	1.76	1.34	1.03	1.20	1.78	9.9	2.81	5997
T	2: 0	1952.8	1951.5	1951.3	----	----	51	2100	12445	1982	62.8	1.19	1.20	34.1	36.3	.34	.38	-7.5	----		----			----		
D	2:14	1953.1	1952.0	1951.9	1.6	12.4	51	2100	12072	2013	63.0	1.19	1.17	34.3	36.8	.34	.38	1.2	1.89	1.34	1.03	1.20	1.78	10.8	3.38	5774
T	2:34	1953.6	1952.5	1952.6	----	----	49	2310	11979	2007	63.8	1.19	1.17	34.6	37.0	.34	.37	3.7	----		----			----		
T	2:54	1954.1	1953.0	1953.2	----	----	49	2310	8659	1995	62.0	1.19	1.17	34.9	36.7	.34	.38	2.5	----		----			----		
D	2:57	1954.1	1953.0	1953.2	1.4	17.4	49	2310	12010	1965	62.0	1.19	1.17	34.9	37.0	.34	.38	2.5	1.91	1.34	1.03	1.20	1.78	11.8	4.89	5615
T	3:17	1954.4	1953.0	1953.5	----	----	58	2310	13128	1977	59.6	1.19	1.18	35.0	36.2	.33	.38	1.2	----		----			----		
T	3:37	1954.8	1953.5	1954.1	----	----	61	2310	12631	1957	59.8	1.19	1.17	34.9	37.4	.33	.39	1.2	----		----			----		
D	3:44	1955.1	1954.0	1954.1	1.5	18.3	60	2310	12220	1975	59.6	1.19	1.17	35.0	37.2	.33	.38	.0	1.99	1.34	1.03	1.20	1.78	12.8	4.72	5494
T	4: 4	1956.1	1955.0	1954.4	----	----	60	2520	11576	1977	60.2	1.19	1.18	35.2	37.3	.35	.38	.0	----		----			----		
D	4: 5	1956.1	1955.0	1954.7	2.3	18.4	65	2520	11297	1995	60.2	1.19	1.22	35.2	37.4	.34	.38	1.2	1.85	1.34	1.03	1.20	1.78	13.8	5.00	5227
T	4:25	1957.0	1956.0	1955.6	----	----	65	2310	11452	1977	60.2	1.19	1.18	35.3	37.5	.34	.37	1.2	----		----			----		
D	4:27	1957.1	1956.0	1955.6	3.2	20.5	61	2520	11700	1995	60.2	1.19	1.17	35.3	37.4	.34	.37	1.2	1.76	1.34	1.03	1.20	1.78	14.8	5.43	5036
D	4:35	1958.1	1957.0	1955.9	7.3	19.2	60	2520	14276	2053	60.0	1.19	1.17	35.4	37.5	.33	.38	1.2	1.51	1.34	1.03	1.20	1.78	15.8	5.55	4753
D	4:42	1959.1	1958.0	1956.2	9.2	19.1	60	2730	13455	2078	59.0	1.19	1.17	35.5	37.8	.32	.37	1.2	1.46	1.34	1.03	1.20	1.78	16.8	5.67	4518
D	4:48	1960.1	1959.0	1956.2	8.9	19.3	61	2730	12166	2088	60.0	1.19	1.17	35.6	37.4	.32	.38	.9	1.44	1.34	1.03	1.20	1.78	17.8	5.77	4303
D	4:56	1961.1	1960.0	1956.5	8.4	18.8	60	3150	13966	2071	59.0	1.19	1.17	35.7	37.8	.32	.38	-1.2	1.45	1.34	1.03	1.20	1.78	18.8	5.90	4105
D	5: 3	1962.2	1961.0	1957.4	7.4	18.3	61	2730	10062	2012	59.6	1.19	1.17	35.7	37.7	.32	.38	-1.2	1.50	1.34	1.03	1.20	1.78	19.8	6.01	3938
D	5: 8	1963.1	1962.0	1958.0	12.7	18.2	58	3150	12910	2007	59.6	1.19	1.17	35.7	37.6	.32	.38	.0	1.31	1.34	1.03	1.20	1.78	20.8	6.10	3769
T	5:28	1964.0	1963.0	1960.2	----	----	58	2730	11328	1949	60.2	1.19	1.17	35.7	37.2	.33	.37	.0	----		----			----		
D	5:31	1964.1	1963.0	1960.8	18.2	18.2	57	2730	9993	2014	59.6	1.19	1.17	35.7	36.7	.34	.37	-1.2	1.35	1.34	1.03	1.20	1.78	21.8	6.24	3629
D	5:38	1965.1	1964.0	1961.7	11.9	17.9	57	3360	11328	2012	60.0	1.19	1.17	35.6	38.0	.34	.36	-1.2	1.30	1.34	1.03	1.20	1.78	22.8	6.35	3504
D	5:41	1966.2	1965.0	1962.0	15.7	19.7	58	3570	12228	2032	59.6	1.19	1.17	35.6	38.0	.34	.36	.0	1.26	1.34	1.03	1.20	1.78	23.8	6.41	3374
D	5:47	1969.1	1965.5	1962.9	12.4	18.4	59	3360	12298	2050	59.6	1.19	1.19	35.6	38.2	.33	.36	-2.5	1.32	1.34	1.03	1.20	1.78	24.3	6.45	3310
D	5:47	1969.2	1968.0	1963.2	48.9	18.8	57	3360	12041	2017	59.6	1.19	1.18	35.6	38.2	.33	.36	-2.5	.94	1.35	1.03	1.20	1.78	26.9	6.46	3003

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

* 16/ 6/82 TIME 5:51 HAMMERHEAD #1

DEPTH OF EXECUTION	1969.66 METERS		
FLOW RATE	1994 L/MN		POWER LAW
MUD DATA	WEIGHT	1.19 SG	
-------	PV	16 CPS	
	YP	9.00 LB/FT2	
	GEL	2.00 LB/100 FT2	
	N	.7618	
	K	.1938 LB/100 FT2	
HOLES VOLUMES	WITH PIPES	79.60 M3	
------------	WITHOUT PIPES	88.92 M3	
	ANNULAR	62.45 M3	
	INSIDE PIPES	17.15 M3	

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						359	16				
DR.STRING	.00	1748.00	4.28	5.00		2474	110				
DR.STRING	1748.00	1803.70	3.00	5.00		432	19				
DR.STRING	1803.70	1978.00	2.81	6.50		1042	82				
BIT						16000	714	M/S		155.6	
ANNULUS	1969.66	1795.28		6.50	8.50	252	11	TU	1185.2	131.2	128.8
ANNULUS	1795.28	1739.58		5.00	8.50	18	1	TU	1322.9	83.3	80.4
ANNULUS	1739.58	1184.00		5.00	8.50	181	8	TU	1322.9	83.3	80.4
ANNULUS	1184.00	143.00		5.00	8.69	282	13	TU	1369.1	77.9	75.0
ANNULUS	143.00	.00		5.00	16.75	3	0	LA	3396.2	15.4	13.1
TOTAL						21853	974				

ANNULAR PRESSURE LOSSES	737 KPA	
EQUIV.CIRCULATING DENSITY	1.23 SG	
MAX DEPTH	4886.77	
MUD LAG TIMES	S -> B	8.60 MN
------------	B -> S	31.31 MN
CUTTINGS DATA	SIZE	.20 CM
------------	DENSITY	2.40 SG
	LAG TIME	33.78 MN
	MAX SLIP VELOCITY	3.17 M/MN
BIT DATA	SIZE	8.50 INCH
--------	NOZZLES	12 12 12 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	16000 KPA
	H.H.P RATIO	73.26 %
	BIT H.H.P	12.576
	BIT VELOCITY	155.60 M/S

GEOSERVICES — HAMMERHEAD #1 — DATE : 16/ 6/82

ON-LINE TDC

BIT#21 RUN#37 HTC J33 BIT DIAMETER : 8.50 inch NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 16 YP = 9 GEL = 2

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	ROP	DRILLING PARAMETERS WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	5:55	1970.1	1969.0	1963.8	5.4	17.9	60	2310	9434	1977	59.2	1.19	1.17	35.7	38.3	.32	.37	-2.5	1.54	1.35	1.03	1.20	1.78	27.8	6.59	2922
T	6:15	1970.6	1969.5	1966.3	----	----	58	2730	13252	2012	58.0	1.19	1.18	35.8	38.2	.31	.37	-2.5								
D	6:18	1971.1	1970.0	1966.6	6.1	18.6	58	2940	12600	2012	58.2	1.19	1.17	35.8	38.2	.31	.37	-2.5	1.52	1.35	1.03	1.20	1.78	28.8	6.97	2899
D	6:26	1972.1	1971.0	1969.9	8.2	19.0	58	3150	13097	2032	58.8	1.19	1.17	35.8	37.9	.32	.37	.0	1.41	1.35	1.03	1.20	1.78	29.8	7.09	2825
D	6:33	1973.1	1972.0	1969.9	7.9	18.6	58	3360	10490	2032	58.0	1.19	1.17	35.8	37.8	.32	.37	-1.2	1.43	1.35	1.03	1.20	1.78	30.8	7.22	2758
T	6:53	1973.4	1972.0	1970.2	----	----	0	.000	-31	544	61.8	1.19	1.19	35.8	36.6	.30	.35	-1.2								
D	7: 3	1974.2	1973.0	1971.1	8.4	20.2	62	2940	12879	1939	61.0	1.19	1.17	35.7	36.7	.30	.35	-3.7	1.45	1.35	1.03	1.20	1.78	31.8	7.40	2709
D	7:10	1975.2	1974.0	1972.1	10.1	18.2	62	3360	13034	1975	61.6	1.19	1.18	35.5	37.7	.30	.35	-1.2	1.38	1.35	1.03	1.20	1.78	32.8	7.52	2645
D	7:15	1976.2	1975.0	1972.7	13.8	18.5	61	3570	13686	1957	61.2	1.19	1.18	35.5	37.9	.30	.35	-1.2	1.30	1.35	1.03	1.20	1.78	33.8	7.61	2582
D	7:23	1977.1	1976.0	1973.3	5.7	18.0	61	3360	13221	1939	61.4	1.19	1.18	35.5	38.2	.31	.36	1.2	1.57	1.35	1.03	1.20	1.78	34.8	7.73	2530
D	7:28	1978.1	1977.0	1973.3	9.6	18.6	61	3360	12197	1957	61.2	1.19	1.17	35.5	38.3	.31	.35	1.2	1.41	1.35	1.03	1.20	1.78	35.8	7.83	2473
D	7:33	1979.1	1978.0	1973.3	12.5	20.1	61	3360	12017	1972	61.4	1.19	1.17	35.6	38.1	.32	.35	1.2	1.32	1.35	1.03	1.20	1.78	36.8	7.91	2418
D	7:39	1980.1	1979.0	1974.2	10.0	20.6	60	3780	12079	1975	61.4	1.19	1.17	35.7	38.0	.32	.36	1.2	1.40	1.35	1.03	1.20	1.78	37.8	8.00	2369
D	7:44	1981.2	1980.0	1974.8	14.6	18.9	60	3570	11793	1962	61.2	1.19	1.18	35.7	36.2	.32	.37	.0	1.29	1.35	1.03	1.20	1.78	38.8	8.09	2320
D	7:49	1982.1	1981.1	1976.0	10.7	18.4	61	3360	13593	1939	60.2	1.19	1.18	35.7	38.3	.30	.37	3.7	1.37	1.35	1.03	1.20	1.78	39.9	8.17	2272
D	8: 0	1983.2	1982.0	1976.9	17.2	17.1	64	2520	13686	1904	60.4	1.19	1.18	35.7	38.2	.31	.35	6.2	1.15	1.35	1.24	1.20	1.87	40.8	8.23	2229
D	8: 5	1984.1	1983.0	1978.2	11.4	19.0	61	2730	12879	1922	60.2	1.19	1.18	35.7	37.8	.32	.35	6.2	1.37	1.35	1.03	1.20	1.78	41.8	8.31	2186
D	8:10	1985.1	1984.0	1979.1	13.8	18.4	62	3570	12918	1904	60.4	1.19	1.18	35.7	38.2	.32	.34	8.7	1.32	1.35	1.03	1.20	1.78	42.9	8.39	2144
D	8:15	1986.1	1985.0	1979.7	11.1	19.0	62	3570	13120	1939	61.0	1.19	1.17	35.8	38.3	.32	.34	10.0	1.39	1.35	1.03	1.20	1.78	43.8	8.48	2108
D	8:20	1987.2	1986.0	1980.9	11.1	18.7	62	3570	12941	1995	61.8	1.19	1.17	35.8	38.2	.32	.35	8.7	1.38	1.35	1.03	1.20	1.78	44.8	8.56	2072
D	8:29	1988.1	1987.0	1982.7	8.2	19.5	61	3570	15052	1975	60.2	1.19	1.17	35.9	38.4	.30	.35	6.2	1.47	1.35	1.03	1.20	1.78	45.8	8.71	2047
D	8:34	1989.1	1988.0	1983.8	10.3	18.9	62	3570	14338	1992	59.6	1.19	1.17	36.0	38.6	.31	.36	7.5	1.40	1.35	1.03	1.20	1.78	46.8	8.79	2013
D	8:39	1990.1	1989.0	1983.9	12.0	19.7	61	3780	13283	1919	60.4	1.19	1.17	36.0	38.4	.31	.35	5.0	1.35	1.35	1.03	1.20	1.78	47.8	8.87	1979
D	8:55	1991.2	1990.0	1986.4	7.2	.0	63	2100	14462	1977	62.2	1.19	1.18	36.1	37.8	.30	.36	8.7	1.51	1.35	1.03	1.20	1.78	48.8	9.01	1955
D	8:59	1992.1	1991.0	1987.0	6.0	19.7	76	3360	13120	1924	61.2	1.19	1.17	36.0	37.8	.30	.37	10.0	1.60	1.35	1.03	1.20	1.78	49.8	9.06	1923
D	9: 6	1993.1	1992.0	1987.6	9.2	17.8	71	3780	13159	1921	60.6	1.19	1.22	36.0	38.2	.33	.36	7.5	1.45	1.35	1.03	1.20	1.78	50.8	9.19	1899
D	9:13	1994.1	1993.0	1989.1	9.6	19.0	71	3990	12507	1906	61.0	1.19	1.17	35.9	38.5	.33	.36	7.5	1.41	1.35	1.03	1.20	1.78	51.8	9.29	1875
D	9:22	1995.1	1994.0	1990.7	5.2	18.5	73	3570	12103	1921	58.6	1.19	1.21	35.9	37.9	.33	.36	6.2	1.59	1.35	1.03	1.20	1.78	52.8	9.46	1858
D	9:29	1996.1	1995.0	1991.0	14.3	18.5	71	3990	11421	1921	57.8	1.19	1.18	35.9	37.8	.33	.35	8.7	1.31	1.35	1.03	1.20	1.78	53.8	9.56	1835
D	9:34	1997.1	1996.0	1991.9	13.3	17.8	71	3780	12103	1957	57.4	1.19	1.18	35.8	37.5	.34	.35	10.0	1.31	1.35	1.03	1.20	1.78	54.8	9.65	1809

ON-LINE TDC
GEOSERVICES BIT REPORT

* 16/ 6/82 HAMMERHEAD #1

#BIT HEADING :BIT#21 RUN#37
#BIT TYPE :INSERT
#BIT IDENTITY :HTC J33
#BIT SIZE : 8.50 INCH
#BIT COST : 6000. $ RIG COST/HR: 5033.
#NOZZLES : 12 12 12 /32NDS @ 95 % EFFICIENCY
#DEPTH IN : 1942.55 METERS 15/ 6/82
#DEPTH OUT : 1997.90 METERS 16/ 6/82
#METRAGE : 55.35 METERS
#TOTAL REVOLUTIONS : 35
#DRILLING TIME: 9:43 HR AVERAGE ROP: 5.69 M/HR
#TIME IN HOLE : 11:47 HR AVERAGE ROP: 4.70 M/HR
#TRIP TIME : 6: 0 HR
#DRILLING COST STANDARD : 2018.4 $/MET
#DRILLING COST ON BOTTOM : 1801.3 $/MET
#DRILLING COST MINIMUM : 1799.2 $/MET

AVERAGE OVER THE RUN AVERAGE HYDRAULICS
#WEIGHT ON BIT : 17.67 TONS NOZZLES SPEED : 154.46 M/S
#ROTATION : 61.30 RPM PRESSURE DROP : 15776 KPA
#FLOW RATE :1979.78 L/MN HYDRAULIC POWER: 698.16 H.P
#STAND PIPE PRESSURE: 12745 KPA

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

* 16/ 6/82 TIME 9:42 HAMMERHEAD #1

* DEPTH OF EXECUTION 1997.66 METERS
* FLOW RATE 1921 L/MN POWER LAW

MUD DATA	WEIGHT	1.19	SG
----------	PV	16	CPS
	YP	14.00	LB/FT2
	GEL	2.00	LB/100 FT2
	N	.6521	
	K	.4798	LB/100 FT2
HOLES VOLUMES	WITH PIPES	80.52	M3
-------------	WITHOUT PIPES	89.95	M3
	ANNULAR	63.12	M3
	INSIDE PIPES	17.40	M3

	FROM METERS	TO	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						336	14				
DR.STRING	.00	1775.60	4.28	5.00		2351	101				
DR.STRING	1775.60	1831.30	3.00	5.00		484	17				
DR.STRING	1831.30	2005.68	2.81	6.50		1723	74				
BIT						14060	638	M/S		149.9	
ANNULUS	1997.66	1823.28		6.50	8.50	236	10	TU	1463.0	126.4	123.5
ANNULUS	1823.28	1767.58		5.00	8.50	17	1	TU	1757.8	80.3	77.7
ANNULUS	1767.58	1184.00		5.00	8.50	178	8	TU	1757.8	80.3	77.7
ANNULUS	1184.00	143.00		5.00	8.69	264	11	TU	1031.8	75.1	72.5
ANNULUS	143.00	.00		5.00	16.75	4	0	LA	5291.9	14.8	13.6
TOTAL						20373	875				

ANNULAR PRESSURE LOSSES 699 KPA

EQUIV.CIRCULATING DENSITY 1.23 SG
MAX DEPTH 5575.84

MUD LAG TIMES	S -) B	9.86	MN
-------------	B -) S	32.85	MN
CUTTINGS DATA	SIZE	.20	CM
-------------	DENSITY	2.40	SG
	LAG TIME	34.52	MN
	MAX SLIP VELOCITY	2.93	M/MN
BIT DATA	SIZE	8.50	INCH
--------	NOZZLES	12 12 12	/32NDS
	NOZZLES EFFICIENCY	95	%
	BIT P. LOSSES	14060	KPA
	H.H.P RATIO	72.94	%
	BIT H.H.P	11.248	
	BIT VELOCITY	149.91	M/S

GEOSERVICES ON-LINE TDC — BIT RUN INITIALISATION

16/ 6/82 — HAMMERHEAD #1

BIT#22 RUN#38 SEQ NBR: 0

STARTING DEPTH 1997.90 METERS

BIT DATA SIZE 8.50
INSERT HTC J22
NOZZLES 12 12 12 @ 95 % EFFICIENCY

DRILL STRING SECTION	TYPE	NBR	LENGTH METERS	ID INCHES	OD	NOMINAL LINEAR WEIGHT (KG/M)
1	DRILL PIPE	192	9.20	4.28	5.00	29.82
2	HEAVY WGT DP	1	55.70	3.00	5.00	73.80
3	DRILL COLLAR	1	174.30	2.81	6.50	136.40

HOLE	ID INCHES	DEPTH (METERS) TOP	BOTTOM
RISER	16.75	.00	143.00
CASING	8.69	143.00	1184.10
OPEN HOLE 1	8.50	1184.00	1997.55

COST DATA BIT COST 8000 $ RIG COST 5833 $/HR
TRIP TIME 6.00 HRS

WEIGHTS HOOK LOAD OFF BOTTOM 110.8 TONS
STRING WEIGHT IN AIR 79.2 TONS

VOLUMES ANNULUS 63.1 M3 IN PIPES 17.3 M3

DEVIATION 1.0 DEG 1.75 M / 100 M

HYDRAULICS NOMINAL ANNULUS PRESSURE LOSSES AT 1600 L/MN : 13 KPA

BIT WEAR TYPE EXPONENT .2
EXPECTED: RUN LENGTH 150 METERS TEETH WEAR 3 /8TH

GEOSERVICES — HAMMERHEAD #1 — DATE : 16/ 6/82

ON-LINE TDC

BIT#22 RUN#38 HTC J22 BIT DIAMETER : 8.50 inch NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 19 YP = 14 GEL = 2

			DEPTHS			DRILLING PARAMETERS						MUD PARAMETERS							OVERPRESSURE SURVEY				ACCUMULATED ON BIT		
	TIME	MEASURED	VERTCL	LAGGED	ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	NORM	PF	ECD	FRAC	METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
T	16:57	1997.9	1996.5	1997.4	----	----					48.8	1.19	1.19	26.6	21.1	.32	.34	-16.								
D	16:58	1998.1	1997.0	1997.4	20.9	12.0	49	2730	14152	1747	48.8	1.19	1.19	26.6	21.1	.32	.34	-16.								
D	17: 6	1999.2	1998.0	1997.7	7.8	13.4	55	2730	13407	1827	48.4	1.19	1.19	26.8	22.0	.33	.33	-15.	.98	1.35	1.03	1.20	1.78	.5	.01	92503
T	17:26	2000.1	1999.0	1998.0	----	----	0	.000	7200	1306	48.4	1.19	1.20	26.8	30.1	.34	.32	-20.	1.30	1.35	1.03	1.20	1.78	1.5	.15	29500
D	17:43	2000.1	1999.0	1998.0	5.3	12.8	48	2730	10862	2036	39.5	1.19	1.20	25.5	31.4	.34	.34	-16.								
D	17:51	2001.1	2000.0	1998.0	7.6	14.3	50	2730	13041	1941	36.5	1.19	1.17	26.0	31.4	.32	.34	-12.	1.44	1.35	1.03	1.20	1.78	2.5	.34	18128
D	17:59	2002.1	2001.0	1998.3	7.4	13.1	51	2730	11452	2103	36.1	1.19	1.12	27.1	33.3	.32	.37	-20.	1.31	1.36	1.03	1.20	1.79	3.5	.48	13190
D	18:12	2003.1	2002.0	1999.8	4.8	15.2	57	2940	10303	2107	39.9	1.19	1.18	28.7	31.7	.33	.45	-29.	1.32	1.36	1.03	1.20	1.79	4.5	.61	10422
D	18:19	2004.1	2003.0	2000.7	7.6	15.2	56	2730	9931	2100	43.8	1.19	1.17	29.9	33.6	.34	.35	-0.7	1.53	1.36	1.03	1.20	1.79	5.5	.83	8699
D	18:31	2005.1	2004.0	2001.9	5.4	15.0	64	3570	11320	2120	50.4	1.19	1.17	29.6	33.2	.33	.36	-10.	1.36	1.36	1.03	1.20	1.79	6.5	.95	7488
D	18:39	2006.1	2005.0	2002.5	6.2	14.9	62	3570	12631	1628	53.4	1.19	1.17	29.4	33.3	.30	.36	-11.	1.48	1.36	1.03	1.20	1.79	7.5	1.14	6649
D	18:48	2007.1	2006.0	2003.1	7.1	16.1	62	3360	12507	1615	58.2	1.19	1.18	29.5	33.3	.29	.37	-11.	1.30	1.36	1.03	1.20	1.79	8.5	1.28	5956
D	18:56	2008.1	2007.0	2003.8	8.9	15.0	63	3570	12010	1615	63.6	1.19	1.17	29.3	33.3	.29	.36	-7.5	1.43	1.36	1.03	1.20	1.79	9.5	1.43	5415
D	19: 2	2009.2	2008.0	2004.4	11.9	16.1	63	3780	12166	1636	71.7	1.19	1.18	29.2	32.8	.29	.30	-10.	1.36	1.36	1.03	1.20	1.79	10.5	1.55	4978
D	19:19	2010.1	2009.0	2005.3	4.5	15.2	68	3570	10397	1523	76.3	1.19	1.15	29.1	33.5	.29	.37	-11.	1.29	1.36	1.03	1.20	1.79	11.5	1.66	4581
D	19:28	2011.1	2010.0	2006.2	6.6	15.8	67	3780	10179	1544	77.1	1.19	1.14	29.2	31.5	.20	.37	-11.	1.58	1.36	1.03	1.20	1.79	12.5	1.81	4295
D	19:36	2012.1	2011.0	2007.1	7.2	15.9	69	3570	12259	1449	77.9	1.19	1.16	29.4	31.0	.20	.37	-6.2	1.47	1.36	1.03	1.20	1.79	13.5	1.97	4035
D	19:45	2013.1	2012.0	2008.3	7.7	16.0	68	3780	12445	1674	80.1	1.19	1.17	29.5	31.3	.29	.37	-5.0	1.42	1.36	1.03	1.20	1.79	14.5	2.09	3805
D	19:54	2014.1	2013.0	2009.6	6.2	13.7	66	3780	12290	1674	80.5	1.19	1.16	29.6	31.7	.29	.35	-2.5	1.41	1.36	1.03	1.20	1.79	15.5	2.24	3620
D	19:59	2015.2	2014.0	2009.9	11.8	12.7	69	3570	0472	1674	80.5	1.19	1.16	29.8	31.3	.30	.34	-2.5	1.40	1.36	1.03	1.20	1.79	16.5	2.30	3449
D	20: 3	2016.1	2015.0	2010.2	14.5	12.4	66	3990	11940	1772	80.1	1.19	1.17	29.9	31.3	.30	.34	-1.2	1.25	1.36	1.03	1.20	1.79	17.5	2.47	3280
D	20: 6	2017.1	2016.1	2010.8	15.1	13.5	66	3780	13252	1903	80.1	1.19	1.19	30.0	31.1	.30	.33	-1.2	1.17	1.36	1.24	1.20	1.87	18.5	2.53	3125
D	20:11	2018.2	2017.0	2011.7	11.5	13.4	67	3990	12569	1868	78.9	1.19	1.17	30.1	31.4	.30	.33	-2.5	1.18	1.36	1.23	1.20	1.82	19.5	2.59	2976
D	20:28	2019.1	2018.0	2013.2	9.9	14.9	64	3360	13469	1812	84.7	1.19	1.17	30.2	31.9	.30	.32	-2.5	1.25	1.36	1.03	1.20	1.79	20.5	2.67	2858
D	20:37	2020.2	2019.0	2014.4	5.9	12.5	65	3570	14152	1810	84.9	1.19	1.15	29.8	32.5	.29	.34	-1.2	1.30	1.36	1.03	1.20	1.79	21.5	2.85	2771
D	20:43	2021.1	2020.0	2016.6	8.8	13.0	64	3570	14431	1812	86.9	1.19	1.12	29.3	32.1	.28	.35	-2.5	1.41	1.36	1.03	1.20	1.79	22.5	2.98	2684
D	20:48	2022.1	2021.0	2016.9	17.4	12.9	65	3780	14998	1830	90.3	1.19	1.15	29.8	32.8	.28	.35	-2.5	1.30	1.36	1.03	1.20	1.79	23.5	3.09	2599
D	20:51	2023.1	2022.0	2017.5	21.1	13.3	67	3570	15145	1812	90.5	1.19	1.16	28.8	32.3	.27	.36	-2.5	1.12	1.36	1.29	1.20	1.89	24.5	3.16	2507
D	20:53	2024.1	2023.1	2018.1	22.1	13.1	65	3780	15852	1823	90.3	1.19	1.16	28.7	32.0	.27	.36	-3.7	1.07	1.36	1.34	1.20	1.91	25.5	3.22	2426
D	20:57	2025.2	2024.0	2018.1	19.8	12.7	65	3780	15269	1830	90.3	1.19	1.12	28.8	31.7	.27	.37	-3.7	1.04	1.36	1.03	1.20	1.79	26.5	3.26	2339
D	21: 2	2026.2	2025.0	2018.4	7.9	13.6	66	3780	15021	1830	90.1	1.19	1.17	29.8	31.9	.27	.36	-3.7	1.09	1.36	1.32	1.20	1.98	27.5	3.32	2268
D	21: 6	2027.1	2026.0	2019.3	15.6	12.3	64	3780	15052	1792	89.9	1.19	1.14	29.1	32.1	.27	.35	-5.8	1.34	1.36	1.03	1.20	1.79	28.5	3.41	2207
D	21:18	2028.1	2026.5	2019.9	9.3	12.9	65	3780	14710	1845	88.7	1.19	1.15	29.4	31.1	.27	.35	-3.7	1.15	1.36	1.26	1.20	1.88	29.5	3.47	2143
D	21:24	2029.2	2028.0	2020.8	12.1	14.3	64	3780	14369	1837	84.3	1.19	1.17	29.8	31.0	.28	.34	-2.5	1.27	1.36	1.03	1.20	1.79	30.0	3.56	2119
D	21:29	2030.1	2029.1	2022.8	14.8	13.9	65	3780	13717	1832	83.9	1.19	1.17	30.0	31.0	.28	.32	-3.7	1.21	1.36	1.03	1.20	1.79	31.5	3.65	2041
D	21:35	2031.1	2030.0	2023.9	8.9	14.3	63	3780	13283	1832	83.5	1.19	1.17	30.2	31.0	.28	.32	-2.5	1.18	1.36	1.22	1.20	1.87	32.5	3.73	1990
D	21:40	2032.1	2031.0	2025.1	12.5	14.2	64	3990	13436	1832	83.1	1.19	1.17	30.3	30.7	.29	.32	-1.2	1.30	1.36	1.03	1.20	1.79	33.5	3.83	1951
D	21:45	2033.3	2032.0	2026.3	12.6	13.1	62	3780	13190	1832	82.7	1.19	1.17	30.4	30.4	.29	.31	.0	1.21	1.36	1.19	1.20	1.85	34.5	3.92	1908
D	21:51	2034.2	2033.0	2027.2	14.8	13.4	64	3780	13190	1832	82.7	1.19	1.17	30.4	30.4	.29	.31	.0	1.21	1.36	1.19	1.20	1.85	35.5	4.00	1868

GEOSERVICES — HAMMERHEAD #1 — DATE : 16/ 6/82

ON-LINE TDC

BIT#22 RUN #38 HTC J22 — BIT DIAMETER : 8.50 inch — NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 14 YP = 20 GEL = 3

	TIME	MEASURED DEPTH	VERTCL DEPTH	LAGGED DEPTH	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	Nm	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
T	23:37	2050.9	1764.6	1764.2	----	----	0	.000	-1831	0	70.1	1.20	1.18	37.4	32.7	.29	.30	1.2	----	----	----	----	----	----	----	----
T	23:57	2051.0	1764.6	1764.2	----	----	0	.000	279	579	84.3	1.20	1.19	31.5	30.3	.29	.31	5.0	----	----	----	----	----	----	----	----
T	0:17	2051.0	2049.7	1765.7	----	----	0	.000	16720	1868	75.9	1.20	1.15	31.4	34.7	.29	.32	-2.5	----	----	----	----	----	----	----	----
T	0:37	2051.0	2049.7	2050.7	----	----	0	.000	-2079	432	75.7	1.20	1.21	32.0	35.5	.29	.31	-3.7	----	----	----	----	----	----	----	----
T	0:57	2051.2	2049.7	2050.7	----	----	74	2520	12569	1869	66.6	1.20	1.17	32.6	33.1	.30	.33	.0	----	----	----	----	----	----	----	----
T	1:17	2052.1	2335.1	2050.7	----	----	75	2730	12352	1869	71.9	1.20	1.17	32.4	33.4	.30	.33	.0	----	----	----	----	----	----	----	----
D	1:18	2052.1	2335.1	2050.7	610.	15.5	73	2730	12079	1804	71.9	1.20	1.17	32.4	33.5	.30	.34	.0	.13	1.46	1.03	1.20	1.84	338.3	6.14	232
D	1:36	2053.2	2336.0	2051.3	3.4	15.9	73	2730	13120	1869	72.3	1.20	1.17	32.1	33.1	.29	.33	.0	1.62	1.46	1.03	1.20	1.84	339.3	6.45	237
D	1:54	2054.1	2337.0	2052.2	5.0	15.8	76	2520	13376	1884	72.3	1.20	1.20	32.3	33.6	.29	.34	.0	1.53	1.46	1.03	1.20	1.84	340.3	6.72	240
D	2:14	2055.1	2338.0	2053.1	3.5	15.7	64	2520	11762	1921	72.5	1.20	1.17	32.5	33.8	.31	.34	.0	1.50	1.46	1.03	1.20	1.84	341.3	7.04	246
T	2:34	2056.1	2339.0	2054.1	----	----	0	.000	-1955	0	72.5	1.20	1.25	32.7	33.9	.31	.30	.0	----	----	----	----	----	----	----	----
D	2:43	2056.1	2339.0	2054.7	3.9	10.5	62	2520	13376	1961	70.9	1.20	1.17	32.7	33.6	.30	.34	.0	1.45	1.46	1.03	1.20	1.84	342.3	7.30	250
T	3: 3	2057.0	2055.0	2055.9	----	----	62	2520	13606	1961	70.3	1.20	1.18	32.8	34.3	.30	.34	.0	----	----	----	----	----	----	----	----
D	3: 5	2057.1	2055.0	2055.9	2.3	11.1	62	2520	13841	1921	70.5	1.20	1.18	32.8	34.6	.30	.34	.0	1.53	1.37	1.03	1.20	1.80	343.3	7.75	256
D	3:21	2058.1	2056.1	2056.2	3.9	12.7	61	2520	14524	1959	69.3	1.20	1.18	33.0	34.9	.29	.33	-1.2	1.43	1.37	1.03	1.20	1.80	344.3	8.01	260

D	3:41	2059.1	2057.0	2057.4	2.0	12.7	64	2520	12352	1961	69.7	1.20	1.19	33.2	34.9	.30	.33	.0	1.53	1.37	1.03	1.20	1.00	345.3	8.27	264
D	3:54	2060.1	2058.1	2058.0	4.9	13.7	61	2520	12569	1957	70.5	1.20	1.15	33.4	35.4	.30	.34	.0	1.38	1.37	1.03	1.20	1.00	346.4	8.47	267
D	4:9	2061.1	2059.0	2058.9	3.5	13.4	62	2520	13190	1961	69.1	1.20	1.17	33.6	35.6	.29	.33	.0	1.45	1.37	1.03	1.20	1.00	347.3	8.71	270
D	4:27	2062.1	2060.0	2060.1	3.6	12.8	61	2520	13593	1954	68.7	1.20	1.18	33.9	35.8	.29	.33	1.2	1.43	1.37	1.03	1.20	1.00	348.3	9.82	274
D	4:42	2063.1	2061.0	2061.1	4.5	12.2	62	2520	13376	1033	67.9	1.20	1.13	34.1	35.9	.28	.34	.0	1.40	1.37	1.03	1.20	1.00	349.3	9.24	277
D	5:0	2064.1	2062.0	2062.0	3.3	12.7	64	2520	13159	1040	67.7	1.20	1.17	34.2	36.4	.29	.33	.0	1.47	1.37	1.03	1.20	1.00	350.3	9.55	282
T	5:20	2064.8	2062.5	2063.2	----	----	11	2940	-1986	0	68.1	1.20	1.20	34.5	36.2	.29	.31	1.2	----	----	----	----	----	----	----	----
D	5:25	2065.1	2063.1	2063.2	4.7	3.9	67	2310	12290	1772	69.1	1.20	1.16	34.5	36.3	.28	.32	2.5	1.35	1.37	1.03	1.20	1.00	351.4	9.80	285
D	5:40	2066.1	2064.0	2064.1	3.9	13.1	62	2520	11979	1757	67.7	1.20	1.16	34.6	36.1	.29	.33	1.2	1.43	1.37	1.03	1.20	1.00	352.3	10.05	288
D	5:54	2067.1	2065.0	2064.7	4.2	13.0	62	2520	11979	1772	67.6	1.20	1.12	34.7	36.7	.29	.33	.0	1.43	1.37	1.03	1.20	1.00	353.3	10.29	291

ON-LINE TDC
GEOSERVICES

HYDRAULIC REPORT

17/ 6/82 TIME 6: 8 HAMMERHEAD #1

DEPTH OF EXECUTION 2867.93 METERS
FLOW RATE 1772 L/MN POWER LAW

MUD DATA	WEIGHT	1.20 SG
----------	PV	12 CPS
	YP	12.00 LB/FT2
	GEL	3.00 LB/100 FT2
	N	.6521
	K	.3598 LB/100 FT2
HOLES VOLUMES	WITH PIPES	82.00 M3
----------	WITHOUT PIPES	92.52 M3
	ANNULAR	64.00 M3
	INSIDE PIPES	10.00 M3

	FROM METERS	TO METERS	PIPE ID INCH	PIPE OD INCH	HOLE DIAM INCH	P.LOSSES KPA	H.P	TYPE	CRITICAL FLOW L/MN	MUD VELOCITY M/MN	CUTTINGS VELOCITY M/MN
SURF.EQPT						275	11				
DR.STRING	.00	1840.00	4.28	5.00		1994	79				
DR.STRING	1840.00	1895.70	3.00	5.00		331	13				
DR.STRING	1895.70	2070.00	2.01	6.56		1411	56				
BIT						12689	503	M/S		138.2	
ANNULUS	2067.93	1893.55	6.56	8.50		193	8	TU	1178.2	116.6	113.4
ANNULUS	1893.55	1837.85	5.00	8.50		14	1	TU	1415.6	74.8	71.2
ANNULUS	1837.85	1184.00	5.00	8.50		163	6	TU	1415.6	74.8	71.2
ANNULUS	1184.00	143.00	5.00	8.69		216	9	TU	1475.2	69.2	66.4
ANNULUS	143.00	.00	5.00	16.75		4	0	LA	4261.7	13.7	12.2
TOTAL						17298	685				

ANNULAR PRESSURE LOSSES 598 KPA

EQUIV.CIRCULATING DENSITY 1.23 SG
MAX DEPTH 7538.17

MUD LAG TIMES	S -> B	10.16 MN
----------	B -> S	36.57 MN
CUTTINGS DATA	SIZE	.20 CM
----------	DENSITY	2.40 SG
	LAG TIME	38.88 MN
	MAX SLIP VELOCITY	3.18 M/MN
BIT DATA	SIZE	8.50 INCH
----------	NOZZLES	12 12 12 /32NDS
	NOZZLES EFFICIENCY	95 %
	BIT P. LOSSES	12689 KPA
	H.H.P RATIO	73.39 %
	BIT H.H.P	8.857
	BIT VELOCITY	138.24 M/S

GEOSERVICES — HAMMERHEAD #1 — DATE : 17/ 6/92

ON-LINE TDC

BIT#22 RUN #38 HTC J22 — BIT DIAMETER : 8.50 inch — NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 12 YP = 12 GEL = 3

	TIME	DEPTHS MEASURED	DEPTHS VERTCL	DEPTHS LAGGED	DRILLING PARAMETERS ROP	WOB	RPM	TORQ	PRESS	FLOW IN	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	DCS	OVERPRESSURE SURVEY NORM	PF	ECD	FRAC	ACCUMULATED ON BIT METER	TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	N*m	KPA	l/mn	m3	sg		degC		ohmm		unit			sg	sg	sg	met	DHr	$/m
D	6:27	2069.1	2067.0	2066.9	4.4	15.3	62	2520	11545	1702	66.8	1.20	1.18	34.8	36.7	.29	.33	2.5	1.50	1.37	1.03	1.20	1.80	355.3	10.03	298
D	6:38	2070.1	2068.0	2067.5	7.4	16.2	62	2730	11545	1772	66.8	1.20	1.18	34.9	36.8	.29	.33	2.5	1.32	1.38	1.03	1.20	1.80	356.3	11.00	300
D	6:48	2071.1	2069.0	2068.1	5.7	16.6	61	2730	11607	1772	66.8	1.20	1.19	35.0	36.5	.29	.33	3.7	1.41	1.38	1.03	1.20	1.80	357.3	11.17	302
D	6:56	2072.1	2070.0	2068.7	7.2	16.1	61	2730	11463	1777	66.6	1.20	1.19	35.0	36.8	.29	.32	2.5	1.36	1.38	1.03	1.20	1.80	358.3	11.31	304
D	7: 1	2073.1	2071.1	2069.8	14.8	15.0	62	2730	11234	1751	66.4	1.20	1.18	35.0	37.1	.29	.33	2.5	1.14	1.38	1.20	1.20	1.89	359.3	11.39	304
D	7:12	2074.2	2072.0	2069.9	4.8	15.4	61	2730	11297	1772	66.0	1.20	1.20	35.1	37.2	.29	.34	2.5	1.50	1.38	1.03	1.20	1.80	360.3	11.58	307
D	7:32	2075.1	2073.0	2071.4	3.3	15.2	67	2730	12134	1809	65.6	1.20	1.23	35.2	36.3	.29	.33	2.5	1.57	1.38	1.03	1.20	1.80	361.3	11.77	309
D	7:44	2076.1	2074.0	2073.3	6.1	15.1	67	2730	11762	1810	65.6	1.20	1.19	35.2	36.8	.30	.33	2.5	1.42	1.38	1.03	1.20	1.80	362.3	11.96	311
D	7:55	2077.1	2075.0	2074.2	4.8	14.9	69	2730	11452	1789	65.4	1.20	1.14	35.1	37.0	.30	.33	.0	1.47	1.38	1.03	1.20	1.80	363.3	12.16	313
D	8: 7	2078.1	2076.1	2075.1	5.2	15.8	66	2940	11203	1789	65.4	1.20	1.19	35.2	36.8	.30	.33	2.5	1.46	1.38	1.03	1.20	1.80	364.3	12.36	316
D	8:20	2079.1	2077.0	2076.3	4.6	14.4	69	2730	10800	1789	65.0	1.20	1.18	35.2	37.2	.30	.33	1.2	1.46	1.38	1.03	1.20	1.80	365.3	12.56	318
D	8:34	2080.1	2078.0	2077.5	4.6	13.4	68	2520	11979	1886	65.0	1.20	1.15	35.3	36.8	.30	.33	2.5	1.44	1.38	1.03	1.20	1.80	366.3	12.80	321
D	8:46	2081.1	2079.0	2078.4	5.0	13.1	68	2730	13438	1886	64.4	1.20	1.17	35.3	36.9	.30	.35	2.5	1.43	1.38	1.03	1.20	1.80	367.3	13.00	323
D	8:56	2082.1	2080.0	2079.0	6.5	13.4	70	2730	12298	1866	64.4	1.20	1.08	35.3	37.6	.30	.34	1.2	1.36	1.38	1.03	1.20	1.80	368.3	13.17	325
D	9: 4	2083.1	2081.0	2080.0	7.0	14.7	67	2940	12072	1886	64.4	1.20	1.19	35.4	37.3	.31	.34	2.5	1.29	1.38	1.03	1.20	1.80	369.3	13.30	326
D	9:11	2084.3	2081.0	2080.0	7.0	-1.7	49	1890	10676	1696	66.0	1.20	1.22	35.4	36.9	.30	.34	3.7	.65	1.30	1.03	1.20	1.80	370.6	13.32	326
D	9:16	2085.1	2083.0	2080.3	9.7	12.4	63	2520	11979	1846	64.2	1.20	1.19	35.4	36.9	.30	.34	1.2	1.19	1.38	1.23	1.20	1.80	371.3	13.39	326
D	9:32	2086.1	2084.0	2081.8	3.6	13.1	64	2730	11421	1828	63.4	1.20	1.17	35.4	37.4	.31	.34	2.5	1.40	1.38	1.03	1.20	1.80	372.3	13.66	329
D	9:47	2087.1	2085.1	2084.8	4.5	14.2	64	2520	11638	1830	64.2	1.20	1.18	35.5	37.3	.30	.34	2.5	1.43	1.38	1.03	1.20	1.80	373.3	13.91	332
D	9:58	2088.1	2086.0	2085.4	4.8	13.4	61	2520	11514	1830	64.2	1.20	1.16	35.6	37.3	.30	.33	2.5	1.39	1.38	1.03	1.20	1.80	374.3	14.10	334
D	10:16	2089.1	2087.0	2086.7	3.6	12.5	62	2520	13003	1961	62.2	1.20	1.19	35.6	37.6	.31	.34	2.5	1.47	1.38	1.03	1.20	1.80	375.3	14.39	338
D	10:32	2090.1	2088.0	2087.9	3.6	14.8	61	2520	12041	1952	60.6	1.20	1.21	35.6	38.0	.31	.34	2.5	1.50	1.38	1.03	1.20	1.80	376.3	14.65	341
D	10:47	2091.1	2089.0	2088.0	4.2	13.9	60	2520	11390	1939	59.6	1.20	1.23	35.7	37.9	.32	.34	1.2	1.46	1.38	1.03	1.20	1.80	377.3	14.91	344
D	11: 3	2092.1	2090.0	2090.0	3.3	15.0	60	2520	11979	1941	58.8	1.20	1.13	35.9	37.9	.32	.35	1.2	1.56	1.38	1.03	1.20	1.80	378.3	15.18	347
D	11:20	2093.1	2091.0	2090.9	3.5	15.3	62	2520	12134	1951	56.0	1.20	1.13	35.9	37.9	.32	.35	1.2	1.54	1.38	1.03	1.20	1.80	379.3	15.45	351
T	11:40	2093.9	2091.5	2092.2	----	----	2	210.	14555	1809	54.6	1.20	1.10	36.1	37.6	.28	.36	2.5	----------	----------	----------	----------	----------	----------	----------	----------
D	11:41	2094.1	2092.1	2092.2	5.9	12.3	53	2310	14617	1773	54.4	1.20	1.18	36.1	37.3	.28	.34	2.5	1.37	1.38	1.03	1.20	1.80	380.4	15.69	354
D	11:55	2095.1	2093.0	2092.8	4.5	14.6	65	2520	12228	1809	53.2	1.20	1.16	36.1	38.4	.29	.35	1.2	1.47	1.38	1.03	1.20	1.80	381.3	15.92	356
D	12:11	2096.1	2094.0	2093.7	4.8	15.0	64	2520	12538	1809	52.4	1.20	1.20	36.3	38.6	.30	.35	.0	1.50	1.38	1.03	1.20	1.80	382.3	16.19	359
D	12:27	2097.1	2095.0	2094.9	3.6	15.4	61	2520	11452	1791	52.0	1.20	1.19	36.4	38.2	.30	.35	1.2	1.53	1.38	1.03	1.20	1.80	383.3	16.46	362
D	12:45	2098.1	2096.0	2095.8	3.6	15.5	61	2520	12755	1834	51.2	1.20	1.19	36.4	38.5	.29	.34	5.0	1.52	1.38	1.03	1.20	1.80	384.3	16.75	366
D	13: 1	2099.2	2097.0	2096.7	3.9	15.5	62	2520	13655	1791	52.0	1.20	1.18	36.4	38.1	.29	.34	3.7	1.54	1.38	1.03	1.20	1.80	385.3	17.02	369
D	13:16	2100.1	2098.0	2097.6	3.9	15.1	61	2520	12259	1791	50.4	1.20	1.15	36.3	38.6	.29	.35	2.5	1.53	1.38	1.03	1.20	1.80	386.3	17.26	372
D	13:32	2101.1	2099.0	2098.6	3.8	14.8	62	2520	10893	1771	50.0	1.20	1.18	36.4	38.4	.29	.34	2.5	1.53	1.38	1.03	1.20	1.80	387.3	17.53	375
D	13:47	2102.1	2100.0	2099.8	4.8	15.7	62	2520	10986	1773	50.4	1.20	1.20	34.6	38.5	.29	.35	2.5	1.51	1.38	1.03	1.20	1.80	388.3	17.78	377
T	14: 7	2102.9	2100.5	2100.7	----	----	52	2520	13717	1756	73.9	1.20	1.19	32.7	38.4	.26	.34	5.0	----------	----------	----------	----------	----------	----------	----------	----------
D	14:10	2103.1	2101.0	2101.0	3.1	15.9	52	2520	13997	1693	75.1	1.20	1.18	32.2	38.5	.26	.35	3.7	1.50	1.39	1.03	1.20	1.80	389.3	18.05	381
D	14:26	2104.1	2102.0	2101.9	3.6	15.8	52	2520	13748	1721	77.5	1.20	1.19	32.7	37.6	.26	.35	3.7	1.51	1.39	1.03	1.20	1.80	390.3	18.32	384
D	14:41	2105.1	2103.0	2102.5	3.9	15.4	51	2730	13097	1716	81.5	1.20	1.19	33.4	37.1	.26	.35	3.7	1.49	1.39	1.03	1.20	1.80	391.3	18.55	386
D	14:55	2106.1	2104.0	2103.4	4.9	15.8	52	2730	11793	1754	82.5	1.20	1.20	34.1	37.2	.27	.33	3.7	1.43	1.39	1.03	1.20	1.80	392.3	18.80	389
D	15:11	2107.2	2105.0	2104.6	3.9	16.0	54	2520	12041	1774	83.3	1.20	1.22	34.6	36.6	.27	.29	6.2	1.50	1.39	1.03	1.20	1.80	393.3	19.05	391
D	15:25	2108.1	2106.0	2105.6	4.0	15.1	52	2520	12321	1771	83.9	1.20	1.07	34.8	36.9	.27	.29	6.2	1.49	1.39	1.03	1.20	1.80	394.3	19.29	394
D	15:43	2109.1	2107.0	2106.8	3.6	15.0	54	2520	12941	1771	82.7	1.20	1.14	35.0	38.4	.27	.32	5.0	1.51	1.39	1.03	1.20	1.80	395.3	19.59	397
D	16: 0	2110.1	2108.0	2108.0	3.6	16.1	52	2520	13003	1809	82.7	1.20	1.19	35.3	37.3	.26	.33	3.7	1.50	1.39	1.03	1.20	1.80	396.3	19.88	401
D	16:17	2111.1	2109.0	2108.9	3.9	15.4	56	2520	12918	1771	83.5	1.20	1.19	35.2	39.1	.26	.34	3.7	1.48	1.39	1.03	1.20	1.80	397.3	20.16	404
T	16:37	2111.6	2109.5	2109.8	----	----	53	2520	13686	1827	83.3	1.20	1.18	36.2	37.8	.27	.33	5.0	----------	----------	----------	----------	----------	----------	----------	----------
D	16:46	2112.1	2110.0	2110.4	2.1	15.4	53	2730	13438	1864	83.7	1.20	1.18	36.4	39.0	.27	.32	5.0	1.65	1.39	1.03	1.20	1.80	398.3	20.52	408
D	17: 0	2113.1	2111.0	2111.4	4.1	16.5	53	2730	13128	1847	83.5	1.20	1.19	36.6	38.8	.27	.32	5.0	1.51	1.39	1.03	1.20	1.81	399.3	20.75	411
D	17: 9	2114.1	2112.0	2111.4	5.0	16.1	61	2940	13314	1824	83.3	1.20	1.19	36.8	38.9	.27	.33	6.2	1.48	1.39	1.03	1.20	1.81	400.3	20.91	412

GEOSERVICES — HAMMERHEAD #1 — DATE : 17/ 6/02

ON-LINE TDC

BIT#22 RUN #38 HTC J22 — BIT DIAMETER : 8.50 inch — NOZZ 12/12/12 — MUD RHEOLOGICAL PARAMETERS : PV = 12 YP = 12 GEL = 3

	TIME	DEPTHS MEASURED	VERTCL	LAGGED	ROP	WOB	DRILLING PARAMETERS RPM	TORQ	PRESS	FLOW	PIT VOL	MUD PARAMETERS DENSITY IN	DENSITY OUT	TEMPERATURE IN	TEMPERATURE OUT	RESISTIVITY IN	RESISTIVITY OUT	GAS	OVERPRESSURE SURVEY DCS	NORM	PF	ECD	FRAC	ACCUMULATED METER	ON BIT TIME	COST
	Hr:mn	met	met	met	m/hr	ton	rpm	Nm	KPA	l/mn	m3	sg		degC		ohm		unit			sg	sg	sg	met	DHr	$/m
D	17:14	2115.2	2113.0	2111.7	16.2	15.1	61	2940	13469	1844	83.3	1.20	1.18	36.8	39.2	.27	.32	6.2	1.18	1.39	1.33	1.20	1.92	481.3	20.98	412
D	17:20	2116.1	2114.1	2112.0	9.9	15.6	59	2940	13159	1827	82.9	1.20	1.18	37.0	39.2	.27	.33	5.0	1.25	1.39	1.83	1.20	1.81	482.3	21.08	412
D	17:27	2117.1	2115.0	2112.6	9.1	13.9	60	2940	13066	1827	82.9	1.20	1.18	37.1	39.4	.26	.33	6.2	1.26	1.39	1.83	1.20	1.81	483.3	21.20	413
D	17:33	2118.2	2116.1	2112.9	13.4	16.4	58	2940	13345	1819	82.5	1.20	1.18	37.2	39.7	.25	.33	5.0	1.15	1.39	1.28	1.20	1.90	484.3	21.30	413
D	17:38	2119.2	2117.1	2113.5	13.7	14.9	58	3150	13072	1827	82.5	1.20	1.18	37.3	39.8	.25	.32	5.0	1.14	1.39	1.29	1.20	1.91	485.3	21.38	414
T	17:58	2119.5	2117.1	2116.2	----	----	0	.000	12693	1770	82.7	1.20	1.20	37.6	40.4	.24	.33	5.0	----		----			----		
T	18:18	2119.5	2117.1	2119.3	----	----	21	1890	13097	1811	82.3	1.20	1.82	37.8	40.6	.25	.33	5.0	----		----			----		
T	18:38	2119.5	2117.1	2119.3	----	----	21	1898	12197	1811	82.1	1.20	1.17	38.1	41.3	.26	.30	3.7	----		----			----		
T	18:58	2119.5	2117.1	2119.3	----	----	0	.000	1676	1175	87.7	1.20	1.18	38.3	41.8	.26	.28	1.2	----		----			----		
T	19:18	2020.7	2117.1	2119.3	----	----	56	2940	6021	1357	82.5	1.20	1.24	37.9	36.4	.27	.29	6.2	----		----			----		
D	19:25	2121.0	2217.5	2119.3	2353	6.6	57	2520	12048	1780	83.1	1.20	1.19	38.0	36.5	.26	.30	2.5	-.43	1.42	1.83	1.20	1.82	505.2	21.48	333
D	19:25	2121.1	2217.5	2119.3	2353	7.5	62	2520	12879	1791	82.9	1.20	1.17	38.0	36.4	.26	.30	1.2	-.43	1.42	1.83	1.20	1.82	505.7	21.48	333
D	19:31	2122.1	2120.1	2119.3	7.2	16.0	58	2940	12817	1791	80.7	1.20	1.16	38.0	38.4	.26	.29	2.5	1.37	1.39	1.83	1.20	1.81	124.3	21.58	1358
D	19:39	2123.1	2121.1	2119.3	7.2	16.3	57	2940	12259	1791	80.5	1.20	1.21	38.0	39.8	.26	.30	1.2	1.39	1.39	1.83	1.20	1.81	125.3	21.70	1354
D	19:45	2124.1	2122.1	2119.3	10.6	17.3	56	3150	12941	1816	80.7	1.20	1.19	37.9	40.0	.26	.31	.0	1.27	1.39	1.83	1.20	1.81	126.3	21.80	1347
D	19:50	2125.1	2123.1	2032.1	11.7	14.6	58	2940	12166	1804	80.9	1.20	1.19	37.9	40.3	.26	.31	1.2	1.20	1.39	1.24	1.20	1.89	127.3	21.88	1340
D	19:55	2126.1	2124.1	2031.2	9.9	16.8	56	3150	13034	1846	80.3	1.20	1.19	37.9	39.8	.25	.31	1.2	1.23	1.39	1.20	1.20	1.87	128.3	21.96	1334
D	20: 1	2127.1	2125.1	2090.8	11.9	15.5	57	3360	12040	1829	80.3	1.20	1.18	37.9	40.3	.25	.32	1.2	1.20	1.39	1.23	1.20	1.88	129.3	22.05	1328
D	20: 5	2128.1	2126.1	2122.0	13.4	15.2	56	3150	12662	1829	80.3	1.20	1.18	37.9	40.3	.25	.32	1.2	1.17	1.39	1.27	1.20	1.90	130.3	22.13	1321
D	20:11	2129.1	2127.1	2122.6	8.7	15.6	57	3360	12662	1829	79.5	1.20	1.17	37.9	37.4	.25	.35	1.2	1.20	1.39	1.83	1.20	1.81	131.3	22.23	1315
D	20:17	2130.1	2128.1	2123.2	9.5	14.6	59	3150	12724	1826	79.7	1.20	1.14	37.9	39.9	.25	.33	-1.2	1.26	1.39	1.83	1.20	1.81	132.3	22.32	1309
T	20:37	2131.0	2128.6	2126.9	----	----	1	1850	11700	1753	79.7	1.20	1.16	37.9	40.4	.25	.33	3.7	----		----			----		
T	20:57	2131.0	2128.6	2130.6	----	----	0	.000	11824	1818	78.3	1.20	1.16	38.1	40.4	.26	.31	5.0	----		----			----		
T	21:17	2131.0	2128.6	2130.9	----	----	0	.000	13198	1766	77.7	1.20	1.16	38.2	40.0	.26	.31	3.7	----		----			----		

ON-LINE TDC
GEOSERVICES HYDRAULIC REPORT

* 17/ 6/82 TIME 21:51 HAMMERHEAD #1

* DEPTH OF EXECUTION 2131.00 METERS *
* FLOW RATE 1810 L/MN POWER LAW *
*
* MUD DATA WEIGHT 1.20 SG *
* ——— PV 12 CPS *
* YP 12.00 LB/FT2 *
* GEL 3.00 LB/100 FT2 *
* N .6521 *
* K .3598 LB/100 FT2 *
*
* HOLES VOLUMES WITH PIPES 84.91 M3 *
* ——— WITHOUT PIPES 94.83 M3 *
* ANNULAR 66.31 M3 *
* INSIDE PIPES 10.60 M3 *

	FROM	TO	PIPE ID	PIPE OD	HOLE DIAM	P.LOSSES	H.P	TYPE	CRITICAL FLOW	MUD VELOCITY	CUTTINGS VELOCITY
	METERS		INCH	INCH	INCH	KPA			L/MN	M/MN	M/MN
SURF.EQPT						285	12				
DR.STRING	.00	1984.40	4.28	5.00		2145	87				
DR.STRING	1984.40	1960.10	3.00	5.00		344	14				
DR.STRING	1960.10	2134.40	2.81	6.50		1466	59				
BIT						13241	536	M/S		141.2	
ANNULUS	2131.00	1956.62		6.50	8.50	200	8	TU	1178.2	119.1	115.9
ANNULUS	1956.62	1900.92		5.00	8.50	14	1	TU	1415.6	75.6	72.8
ANNULUS	1900.92	1184.00		5.00	8.50	186	8	TU	1415.6	75.6	72.8
ANNULUS	1184.00	143.00		5.00	8.69	225	9	TU	1475.2	78.7	67.9
ANNULUS	143.00	.00		5.00	16.75	4	0	LA	4261.7	14.0	12.5
TOTAL						10118	733				

ANNULAR PRESSURE LOSSES 638 KPA

EQUIV.CIRCULATING DENSITY 1.23 SG
MAX DEPTH 7194.37

* MUD LAG TIMES S -) B 10.27 MN *
* ——— B -) S 36.64 MN *

* CUTTINGS DATA SIZE .20 CM *
* ——— DENSITY 2.40 SG *
* LAG TIME 38.00 MN *
* MAX SLIP VELOCITY 3.19 M/MN *

* BIT DATA SIZE 8.50 INCH *
* ——— NOZZLES 12 12 12 /32NDS *
* NOZZLES EFFICIENCY 95 % *
* BIT P. LOSSES 13241 KPA *
* H.H.P. RATIO 73.11 % *
* BIT H.H.P 9.441 *
* BIT VELOCITY 141.21 M/S *

ON-LINE TDC
GEOSERVICES

BIT REPORT

17/ 6/82 HAMMERHEAD #1

#BIT HEADING :BIT#22 RUN #38
#BIT TYPE :INSERT
#BIT IDENTITY :HTC J22

#BIT SIZE : 8.50 INCH
#BIT COST : 8888. $ RIG COST/HR: 5033.

#NOZZLES : 12 12 12 /32NDS @ 95 % EFFICIENCY

#DEPTH IN : 1997.90 METERS 16/ 6/82
#DEPTH OUT : 2131.00 METERS 17/ 6/82
#METRAGE : 133.10 METERS
#TOTAL REVOLUTIONS : 62

#DRILLING TIME: 22:24 HR AVERAGE ROP: 5.94 M/HR
#TIME IN HOLE : 28: 4 HR AVERAGE ROP: 4.74 M/HR
#TRIP TIME : 6: 0 HR

#DRILLING COST STANDARD : 1553.3 $/MET
#DRILLING COST ON BOTTOM : 1304.8 $/MET
#DRILLING COST MINIMUM : 231.6 $/MET

AVERAGE OVER THE RUN AVERAGE HYDRAULICS
#WEIGHT ON BIT : 14.18 TONS NOZZLES SPEED : 141.21 M/S
#ROTATION : 61.38 RPM PRESSURE DROP : 13241 KPA
#FLOW RATE :1010.00 L/MN HYDRAULIC POWER: 535.74 H.P
#STAND PIPE PRESSURE: 12900 KPA