MINORA RESOURCES NL

PEP 111
OTWAY BASIN
VICTORIA

WINDERMERE-2

WELL COMPLETION REPORT
VOLUME II

(W992)

Minora Resources NL

APPENDIX A

APPENDIX A

DAILY DRILLING REPORTS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 4/0 Report No. 1 Date 9/3/89

2 Total Depth 24 m Progress 24 m Last csg 20" @ 10 m. Logged to - m

3 Current Activity DRILLING 17 1/2" SURFACE HOLE

4 Dev/Depth LAST BOP TEST -

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
	1	Varel	L114	17 1/2"	29801	3x22	24	10	1.5	6.7	-
6											

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	1	2.20k	120	8.5	5	145	715	1200	61	88	98	10	11	-	0.04
8				15	6	65									

9 BHA Description: BIT-BIT SUB (& FLOAT)-8" MONEL-8" DC-STABILISER-2X8" DC'S- 12X 6 1/2" DC'S- 6 X HWDP

10 WELL COSTS: Daily$ 240,559 Cum$ 240,559 MUD: Daily$ 269 Cum$ 269

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.1	46	10	27	14/24	-	-	-	8.0	.05	-	560	9K	17.5	5.5	1/4	-	2%	-

Mud Matl's Used: 20 KWIKTHIK, 1 CAUSTIC, 1 LIME

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
			-	-	-	-	20.8klts	

14 POB: Oper 1 Contr 15 Service GEOD 2, HALLI 1, MI 1 Total 20

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	17.0	RIGGED UP
1700	1.0	DRILLED KELLY DOWN TO MAKE UP KELLY COCK
1800	3.0	DRILLED RATHOLE AND MOUSEHOLE
2100	1.5	MADE UP 17 1/2" BHA
2230	1.5	SPUD. DRILLED AHEAD FROM 14M TO 24.13M

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	1.5	1.5
3. Reaming		
4. Coring		
5. Circ.& Cond		
6. Trips		
7. Repair Rig		
8. Rig Maint.		
9. Dev.Survey		
10.Log & Perf		
11.RU RunCsg,Tub		
12.Cementing		
13.NU,Test BOPCsg		
14.PU/LD,DP/DC		
15.DST		
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		
21.WOW/WOC		
22.Completion		
23.P & A		
24.FIT		
25.D/H Trouble		
26.Surf.Trouble		
27.CUM TOTAL	1.5	1.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 5/1 Report No. 2 Date 10/3/89

2 Total Depth 341 m Progress 317m Last csg 20" @ 10 m. Logged to - m

3 Current Activity RUNNING 13 3/8" SURFACE CASING

4 Dev/Depth 1/4° @ 94m; 1/2° @ 186 m; 0 ° @ 328 m. LAST BOP TEST -

6

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
1	Varel	L114	17 1/2"	29801	3x22	341	331	14 1/2"	22.8	2.2.I

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	1	2.20k	120	8.5	5	145	715	1200	61	88	98	10	11	-	0.04
8				15	6	65									

9 BHA Description: BIT-BIT SUB (& FLOAT)-8" MONEL-8" DC-STABILISER-2X8" DC'S-12X 6 1/2" DC'S- 6 X HWDP

10 WELL COSTS: Daily$ 40,813 Cum$ 281,372 MUD: Daily$ 1652 Cum$ 1921

11

WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
9.1	46	10	27	14/24	-	-	-	8.0	.05	-	560	9K	17.5	5.5	1/4	-	2%	-

Mud Matl's Used: 20 KWIKTHIK, 80 KCL, 1 LIME

13

WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
Used	Bal	Used	Bal	Used	Bal	Used	Bal
		-	-	-	-		

14 POB: Oper 1 Contr 15 Service GEOD 2, HALLI 1, MI 1 Total 21

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	3.0	DRILLED TO 69M
0300	0.5	RAN SURVEY - MISRUN
0330	0.5	DRILLED TO 73M
0400	0.5	RAN SURVEY - MISRUN
0430	0.5	DRILLED TO 111M
0500	1.0	CIRCULATED & RAN SURVEY
0600	5.0	DRILLED TO 205M
1100	0.5	CIRCULATED & RAN SURVEY
1130	4.5	DRILLED TO 341M
1600	1.5	CIRCULATED HOLE, CLEAN & RUN SURVEY
1730	1.5	POH.STRAPPED OUT: NO CORRECTION
1900	2.0	RIGGED FOR CASING
2100	1.0	REPAIRED POWER TONG
2200	2.0	RAN 13 3/8" SURFACE CASING

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	13.5	14.5
3. Reaming		0.5
4. Coring		
5. Circ.& Cond	1.5	1.5
6. Trips	1.5	1.5
7. Repair Rig	1.0	1.0
8. Rig Maint.		
9. Dev.Survey	2.5	2.5
10.Log & Perf		
11.RU RunCsg,Tub	4.0	4.0
12.Cementing		
13.NU,Test BOPCsg		
14.PU/LD,DP/DC		
15.DST		
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		
21.WOW/WOC		
22.Completion		
23.P & A		
24.FIT		
25.D/H Trouble		
26.Surf.Trouble		
27.CUM TOTAL	24.0	25.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 6/2 Report No. 3 Date 11/3/89

2 Total Depth 341 m Progress – m Last csg 13 3/8"@ 314 m. Logged to – m

3 Current Activity (00.00 hours 12/3/89) NIPPLE UP BOP'S

4 Dev/Depth – °@ – m; – ° @ – m; – ° @ – m. LAST BOP TEST –

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
–	–	–	–	–	–	–	–	–	–	–

6

Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

7

8

9 BHA Description: BIT-BIT SUB (& FLOAT)-8" MONEL-8" DC-STABILISER-2X8" DC'S-12X 6 1/2" DC'S- 6 X HWDP

10 WELL COSTS: Daily$ 63,147 Cum$ 345,019 MUD: Daily$ Nil Cum$ 1921

11

WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
9.0	34	8	11	7/13	–	–	–	8.0	–	–	480	7K	15	5	Tr	–	1.2%	–

Mud Matl's Used: NIL

CEMENTING MATERIALS: 27 MAGCOGEL, 2 CALCIUM CHLORIDE, 728 CLASS G CEMENT

13

WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
Used	Bal	Used	Bal	Used	Bal	Used	Bal
		–	–	–	–		

14 POB: Oper 1 Contr 15 Service GEOD 2, HALLI 1, MI 1 Total 21

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	4.5	RAN TOTAL OF 26xR3 JTS & 2 PUPS 68 & 72 PPF K55 BUTTRESS CASING TO 313.98M
0430	0.5	RIGGED UP CEMENTING HEAD & LINES
0500	2.0	CIRCULATED CASING (PREPARING MIX WATER)
0700	2.0	PUMPED 50 BBLS WATER. PRESSURE TESTED LINES TO 3000 PSI. MIXED & PUMPED 413SX "G" WITH 4.3% PREHYDGEL (BWOW) @ 11.3PPG,FOLLOWED BY 227SX "G"NEAT @ 15.8 PPG. DISPLACED MUD USING RIG PUMP. BUMPED PLUG AT 0855HRS 11/3/89. PRESSURE TESTED CASING TO 3000PSI. OK. EST.140 BBLS CEMENT RETURNS.
0900	9.5	WOC.CUT CONDUCTOR. ANN/CMT DROPPED TOPPED UP WITH 88SX "G" WITH 4% CaCl USING STINGER AT 13M RKB.
1830	5.5	SLACKED OFF CASING & BACKED OUT LANDING JOINT. INSTALLED FMC 3000 PSI BRADENHEAD C/W WEAR BUSHING. INSTALLED & NIPPLED UP BOPS.

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling		14.5
3. Reaming		0.5
4. Coring		
5. Circ.& Cond	2.0	3.5
6. Trips		1.5
7. Repair Rig		1.0
8. Rig Maint.		
9. Dev.Survey		2.5
10.Log & Perf		
11.RU RunCsg,Tub	4.5	8.5
12.Cementing	2.5	2.5
13.NU,Test BOPCsg	5.5	5.5
14.PU/LD,DP/DC		
15.DST		
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		
21.WOW/WOC	9.5	9.5
22.Completion		
23.P & A		
24.FIT		
25.D/H Trouble		
26.Surf.Trouble		
27.CUM TOTAL	24.0	49.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 7/3 Report No. 4 Date 12/3/89

2 Total Depth 604 m Progress 263m Last csg 13 3/8"@ 314 m. Logged to - m

3 Current Activity RUNNING SURVEY (24HRS 12/3/89)

4 Dev/Depth 0 °@ 396m; 1/2° @ 462 m; 1/2° @ 585 m. LAST BOP TEST 12/3/89

6

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
2	Varel	L135	12 1/4"	23998	2x14,22	-	263	7.5	35.1	-

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	2	2.0k	120	15	6	100	306	1550	123	312	590	288	49	-	2.44
8				8.5	6	55	347		186						

9 BHA Description: BIT-BIT SUB (& FLOAT)-8" MONEL-STABILISER-2X8" DC'S-STAB- 1 8"DC-XO-12X 6 1/2" DC'S-JARS-1X6 1/2" DC- 6 X HWDP

10 WELL COSTS: Daily$ 29,728 Cum$ 374,747 MUD: Daily$ 1536 Cum$ 3457

11

WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
8.7	41	9	15	4/7	16.4	3	-	9.5	0.1	-	240	19.5	7.5	2 1/4	50	0.5	2%	3%

Mud Matl's Used: 80 SALT, 10 SPERSENE, 5 SODA ASH, 2 CAUSTIC, 8 POLYSAL, 2 NITRATE

13

WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
Used	Bal	Used	Bal	Used	Bal	Used	Bal
		-	-	-	-	1300	31700

14 POB: Oper 2 Contr 15 Service GEOD 2, HALLI 1, MI 1 Total 22

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	3.0	NIPPLED UP BOP'S
0300	1.0	CHANGED PIPE RAMS TO 4 1/2"
0400	2.0	PREPARED TO PICK UP 12 1/4" BHA RIGGED UP HALLIBURTON ON KILL LINE
0600	1.0	PRESSURE TESTED WELLHEAD,BLIND RAMS HCR, & INNER CHOKE LINE VALVE TO 2500PSI.OK.
0700	3.0	MADE UP 12 1/4" BHA & RIH.TAGGED CEMENT AT 301M
1000	2.0	WITH HALLIBURTON ON CHOKE LINE, PRESSURE TESTED KELLY COCKS, PIPE RAMS & KILL LINE VALVES TO 2500PSI HYDRIL TO 1500PSI (TESTED MANIFOLD LINES & VALVES & STABBING VALVES TO 2500PSI INDEPENDENTLY. OK.)
1200	2.5	DRILLED OUT CEMENT
1430	0.5	WASHED 314 - 341M. DRILLED TO 344M
1500	0.5	CONDUCTED FIT. LEAK OFF @ 540PSI/ 8.9PPG (EQUIVALENT MUD WEIGHT = 19.0 PPG)
1530	2.5	DRILLED TO 414M
1800	0.5	RAN SURVEY
1830	1.5	DRILLED TO 480M
2000	0.5	RAN SURVEY
2030	3.0	DRILLED TO 604M
2330	0.5	RAN SURVEY

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	7.5	22.0
3. Reaming	2.5	3.0
4. Coring		
5. Circ.& Cond		3.5
6. Trips	3.0	4.5
7. Repair Rig		1.0
8. Rig Maint.		
9. Dev.Survey	1.5	4.0
10.Log & Perf		
11.RU RunCsg,Tub		8.5
12.Cementing		2.5
13.NU,Test BOPCsg	9.0	14.5
14.PU/LD,DP/DC		
15.DST		
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT	0.5	0.5
25.D/H Trouble		
26.Surf.Trouble		
27.CUM TOTAL	24.0	73.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J F OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 8/4 Report No. 5 Date 13/3/89

2 Total Depth 1003 m Progress 399m Last csg 13 3/8"@ 314 m. Logged to – m

3 Current Activity DRILLING 12 1/4" HOLE (24HRS 13/3/89)

4 Dev/Depth 1/4° @ 720m; 1/2° @ 852 m; 1/2° @ 975 m. LAST BOP TEST 12/3/89

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
2	Varel	L135	12 1/4"	23998	2x14,22	–	662	26	25.5	–

6

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	2	20-	120	8.5	6	100	571	1550	108	273	516	206	40	–	1.75
8		30		15	6	42			163						

9 BHA Description: BIT-BIT SUB (& FLOAT)-8" MONEL-STABILISER-2X8" DC'S-STAB- 1 8"DC-XO-12X 6 1/2" DC'S-JARS-1X6 1/2" DC- 6 X HWDP

10 WELL COSTS: Daily$ 16300 Cum$ 391,047 MUD: Daily$ 3572 Cum$ 7030

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.3	44	10	12	7/19	8.8	1	–	9.0	.05	–	240	28K	20	6	1/4	100	0.2	4.0

Mud Matl's Used: 120 SALT, 2 SPERSENE, 4 CAUSTIC, 15 PAC, 3 NITRATE, 20 POLYSAL

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
			–	–	–	–	4800	31700

14 POB: Oper 2 Contr 15 Service GEOD 2, HALLI 1, MI 1 Total 22

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	0.5	DRILLED TO 641M (SHAKERS BLINDING)
0030	0.5	CHANGE TO LARGER SHAKER SCREENS
0100	0.5	DRILLED TO 670M (STILL LOSING MUD OVER SHAKER)
0130	1.0	CHANGE TO LARGER SHAKER SCREENS. BUILD UP MUD VOLUME.
0230	3.0	DRILLED TO 737M
0530	0.5	RAN SURVEY
0600	5.0	DRILLED TO 861M
1100	0.5	CIRCULATED, RAN SURVEY, MISRUN, REPAIRED MUDLOGGERS DEPTH SYSTEM.
1130	0.5	DRILLED TO 870M
1200	0.5	CIRCULATED & RAN SURVEY
1230	1.5	DRILLED TO 898M
1400	0.5	CIRCULATED
1430	1.5	MADE WIPER TRIP TO SHOE.HOLE GOOD
1600	6.5	DRILLED TO 993M
2230	0.5	RAN SURVEY
2300	1.0	DRILLED TO 1003M

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	18.5	40.5
3. Reaming		3.0
4. Coring		
5. Circ.& Cond	0.5	4.0
6. Trips	1.5	6.0
7. Repair Rig		1.0
8. Rig Maint.		
9. Dev.Survey	2.0	6.0
10.Log & Perf		
11.RU RunCsg,Tub		8.5
12.Cementing		2.5
13.NU,Test BOPCsg		14.5
14.PU/LD,DP/DC		
15.DST		
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		0.5
25.D/H Trouble		
26.Surf.Trouble	1.5	1.5
27.CUM TOTAL	24.0	97.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 9/5 Report No. 6 Date 14/3/89

2 Total Depth 1200 m Progress 197m Last csg 13 3/8"@ 314 m. Logged to - m

3 Current Activity DRILLING 12 1/4" HOLE (24HRS 14/3/89)

4 Dev/Depth 1/2° @ 1098m; 1/2° @ 1184 m; - ° @ - m. LAST BOP TEST 12/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
	2	Varel	L135	12 1/4"	23998	2x14,22	1197	856	36.5	25.5	7 5 1/8
6	3	Reed	S13G	12 1/4"	BB1419	2x14,22	-	3	.5	5.0	

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	2	20-30	120	8.5	6	100	571	1550	108	273	516	206	40	-	1.75
8	-	30	-	15	6	30	495	1550	163	236	447	136	30	-	1.15

9 BHA Description: BIT-BIT SUB (& FLOAT)-8" MONEL-STABILISER-2X8" DC'S-STAB- 1 8"DC-XO-12X 6 1/2" DC'S-JARS-1X6 1/2" DC- 6 X HWDP (43 hrs on jars)

10 WELL COSTS: Daily$ 21599 Cum$ 412,646 MUD: Daily$ 1172 Cum$ 8201

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.4	45	11	14	4/14	8.0	1	-	8.8	.05	-	280	27K	20	7	Tr	100	1.5	2.5

Mud Matl's Used: 50 KCL, 3 SPERSENE, 2 CAUSTIC, 1 NITRATE, 1 BIOCIDE

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
			-	370	-	671	4550	22350

14 POB: Oper 2 Contr 15 Service GEOD 2, HALLI 1, MI 1, CE 1 Total 23

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	1.0	DRILLED TO 1013M
0100	1.0	CIRCULATED SAMPLE
0200	0.5	REPAIR NO.2 PUMP
0230	4.5	DRILLED TO 1116M
0700	0.5	CIRCULATED & RAN SURVEY
0730	4.5	DRILLED TO 1193M
1200	1.0	CIRCULATED SAMPLE
1300	0.5	DRILLED TO 1197M
1330	0.5	CIRC,RAN SURVEY,PUMPED KCL PILL
1400	1.0	POH TO 905M
1500	1.0	WORK/REAM TIGHT HOLE, PUMPED OUT 2 SINGLES TO 885M
1600	1.5	FINISHED POH (885-800M TIGHT)
1730	1.0	CHANGED BIT. INSPECT STABS (BOTH I.G). RIH TO SHOE
1830	1.0	SLIPPED & CUT DRILLING LINE
1930	1.5	RIH TO 922M
2100	2.5	REAMED 922-944M, 1026-1057M & 1072-1197M
2330	0.5	BROKE IN NEW BIT & DRILLED TO 1200M

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	11.0	51.5
3. Reaming	3.5	6.5
4. Coring		
5. Circ.& Cond	2.5	6.5
6. Trips	5.0	11.0
7. Repair Rig	0.5	1.5
8. Rig Maint.	1.0	1.0
9. Dev.Survey	0.5	6.5
10.Log & Perf		
11.RU Run Csg.Tub		8.5
12.Cementing		2.5
13.NU,Test BOPCsg		14.5
14.PU/LD,DP/DC		
15.DST		
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		0.5
25.D/H Trouble		
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	121.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 10/6 Report No. 7 Date 15/3/89

2 Total Depth 1559 m Progress 359m Last csg 13 3/8"@ 314 m. Logged to - m

3 Current Activity DRILLING 12 1/4" HOLE (24HRS 15/3/89)

4 Dev/Depth 1 °@ 1309m; 1/4° @ 1461 m; - ° @ - m. LAST BOP TEST 12/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
	3	Reed	S13G	12 1/4"	BB1419	2x14,22	-	362	21.5	16.8	-
6											

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	3	30-40	110	8.5	6	75	482	1600	91	230	449	125	28	-	1.06
8	-	-	120	15	6	40	-	-	137	-	-	-	-	-	-

9 BHA Description: BIT-BIT SUB (& FLOAT)-8" MONEL-STABILISER-2X8" DC'S-STAB- 1 8"DC-XO-12X 6 1/2" DC'S-JARS-1X6 1/2" DC- 6 X HWDP (64 hrs on jars)

10 WELL COSTS: Daily$ 21528 Cum$ 434,174 MUD: Daily$ 2628 Cum$ 10,829

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.4	44	9	16	8/18	12.4	2	-	8.8	.05/.35	-	480	24K	25	7	Tr	200	2.3	1.5

Mud Matl's Used: 50 KCL, 5 SPERSENE, 7 CAUSTIC, 6 PAC, 20 POLYSAL

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
			-	400	-	671	4250	18100

14 POB: Oper 3 Contr 15 Service GEOD 2, HALLI 2, MI 1, CE 1 , JVP 1 Total 25

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	6.5	DRILLED TO 1327M
0630	0.5	REPAIRED HYDROMATIC CHAIN
0700	0.5	RAN SURVEY
0730	3.0	DRILLED TO 1393M
1030	0.5	WORK ON SCR RELAY FOR PUMP POWER UNIT
1100	5.5	DRILLED TO 1479M
1630	0.5	RAN SURVEY
1700	2.0	DRILLED TO 1506M
1900	1.0	CIRCULATED SAMPLE
2000	4.0	DRILLED TO 1559M

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	21.0	72.5
3. Reaming		6.5
4. Coring		
5. Circ.& Cond	1.0	7.5
6. Trips		11.0
7. Repair Rig	1.0	2.5
8. Rig Maint.		1.0
9. Dev.Survey	1.0	7.5
10.Log & Perf		
11.RU Run Csg.Tub		8.5
12.Cementing		2.5
13.NU,Test BOPCsg		14.5
14.PU/LD,DP/DC		
15.DST		
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		0.5
25.D/H Trouble		
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	145.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 11/7 Report No. 8 Date 16/3/89

2 Total Depth 1744 m Progress 185m Last csg 13 3/8"@ 314 m. Logged to - m

3 Current Activity WORK TIGHT HOLE POH TO PICK UP CORE BARREL

4 Dev/Depth 0 °@ 1585m; - ° @ - m; - ° @ - m. LAST BOP TEST 12/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
	3	Reed	S13G	12 1/4"	BB1419	2x14,22	1744	547	41.5	13.2	7.8.1/8
6											Skidded

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	3	35-40	110	8.5	6	75	482	1600	91	230	449	125	28	-	1.06
8	-	-	120	15	6	40	-	-	137	-	-	-	-	-	-

9 BHA Description: BIT-BIT SUB (& FLOAT)-8" MONEL-STABILISER-2X8" DC'S-STAB- 1 8"DC-XO-12X 6 1/2" DC'S-JARS-1X6 1/2" DC- 6 X HWDP (84 hrs on jars)

10 WELL COSTS: Daily$ 27763 Cum$ 461,837 MUD: Daily$ 3148 Cum$ 13,977

11	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
	9.3	41	9	12	2/7	6.4	1	-	9.3	11/14	-	280	18.5K	22.5	6.8	Tr	200	2.0	0.4

Mud Matl's Used: 40 KCL, 7 CAUSTIC,15 PAC, 20 POLYSAL

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
			-	400	-	671	4250	13860

14 POB: Oper 3 Contr 14 Service GEOD 2, HALLI 2, MI 1, CE 1 , JVP 2 Total 25

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	3.0	DRILLED TO 1603M
0300	0.5	CIRCULATED AND RAN SURVEY
0330	17.0	DRILLED TO 1743.78
2030	1.5	CIRCULATED SAMPLE
2200	0.5	PUMPED KCL PILL, DROPPED SURVEY
2230	1.0	POH. STRAP OUT
2330	0.5	PICKED UP KELLY. WORK TIGHT HOLE @ 1561M

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	20.0	92.5
3. Reaming	0.5	7.0
4. Coring		
5. Circ.& Cond	2.0	9.5
6. Trips	1.0	12.0
7. Repair Rig		2.5
8. Rig Maint.		1.0
9. Dev.Survey	0.5	8.0
10.Log & Perf		
11.RU Run Csg.Tub		8.5
12.Cementing		2.5
13.NU,Test BOPCsg		14.5
14.PU/LD,DP/DC		
15.DST		
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		0.5
25.D/H Trouble		
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	169.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 12/8 Report No. 9 Date 17/3/89

2 Total Depth 1749 m Progress 5m Last csg 13 3/8"@ 314 m. Logged to - m

3 Current Activity POH WITH CORE NO.1

4 Dev/Depth 0 °@ 1728m; - ° @ - m; - ° @ - m. LAST BOP TEST 12/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
6	CH1RR	Chrs'n	RC476 PDC	8 1/2"	1440532	-	1749	5	10.5	0.5	5% worn

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	CH1	8-10	65	8.5	6	86	263	500	50	-	77	-	-	-	-
8	-	-	80	-	-	-	-	-	60	-	-	-	-	-	-

9 BHA Description: 8 1/2" CH-60FT CORE BARREL-10 X 6 1/2" DC'S-JARS-1X 6 1/2" DC'S-6X HWDP (94.5 HRS ON JARS)

10 WELL COSTS: Daily$ 22618 Cum$ 484,455 MUD: Daily$ 2444 Cum$ 16421

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.4	39	9	12	2/7	6.8	1	-	9.3	.1/.35	-	300	25K	25	7.3	Tr	250	3.2	-

Mud Matl's Used: 60 KCL, 5 CAUSTIC,13 PAC, 1 NITRATE

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
			-	400	-	370	4240	25920

14 POB: Oper 3 Contr 14 Service GEOD 2, HALLI 3, MI 1, CE 1 , JVP 2 Total 26

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	4.0	WORK THROUGH TIGHT HOLE 1561-1017M
0400	2.0	POH
0600	1.0	LAY DOWN STABILISER,RECOVER SURVEY
0700	1.0	MAKE UP 18M CORE BARREL
0800	0.5	RIH TO SHOE
0830	0.5	SLIPPED DRILLING LINE
0900	1.5	RIH
1030	1.0	WASH & REAM TIGHT HOLE 1700-1743M
1130	0.5	CIRCULATE
1200	0.5	DROP BALL & WAIT FOR PRESS INCREASE TAG BOTTOM
1230	10.5	CUT CORE NO.1 (1743.78-1749.31m)
2300	1.0	BREAK OFF CORE & POH. CHAIN OUT

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling		92.5
3. Reaming		7.0
4. Coring	11.5	11.5
5. Circ.& Cond	1.0	10.5
6. Trips	6.0	18.0
7. Repair Rig		2.5
8. Rig Maint.	0.5	1.5
9. Dev.Survey		8.0
10.Log & Perf		
11.RU Run Csg.Tub		8.5
12.Cementing		2.5
13.NU,Test BOPCsg		14.5
14.PU/LD,DP/DC		
15.DST		
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		0.5
25.D/H Trouble	5.0	
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	193.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J E OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 13/9 Report No. 10 Date 18/3/89

2 Total Depth 1779 m Progress 30m Last csg 13 3/8"@ 314 m. Logged to - m

3 Current Activity CUTTING CORE NO .2

4 Dev/Depth - °@ - m; - ° @ - m; - ° @ - m. LAST BOP TEST 12/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
	4	Reed	HP51a	8 1/2"	BT4862	11,2x12	1777	28	3.5	8.0	1.1.I
6	RRCH1	Chr'tn	RC476	8 1/2"	1440532	-	-	2	1.5	1.3	

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	4	30	60	8.5	6	120	367	1600	300	375	342	254	74	-	2.15
8	RRCH1	10	70	8.5	6"	86	263	500	210	-	240	-	-		

9 BHA Description: 8 1/2" CH-60FT CORE BARREL-14 X 6 1/2" DC'S-JARS-1X 6 1/2" DC'S-6X HWDP (99.5 HRS ON JARS)

10 WELL COSTS: Daily$ 27093 Cum$ 511,549 MUD: Daily$ 3061 Cum$ 19481

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.3	43	8	15	3/7	6.8	1	-	9.9	.15/.55	-	120	21K	17.5	6.3	Tr	250	2.6	-

Mud Matl's Used: 30 KCL, 8 CAUSTIC,25 PAC

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
			-	440	-	671	3000	22920

14 POB: Oper 3 Contr 14 Service GEOD 2, HALLI 3, MI 1, CE 1 , JVP 2 Total 26

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	2.5	POH. CHAIN OUT
0230	1.5	RECOVERED 4.3M (78%)CORE,SERVICED BARREL & STOOD BACK IN DERRICK
0400	3.5	RIH WITH 8 1/2" BIT & SLICK BHA. PICKED UP 4 MORE DC'S. 1/4M FILL
0730	3.0	DRILLED TO 1770M
1030	2.5	CIRCULATED SAMPLE
1300	0.5	DRILLED TO 1777M
1330	2.0	CIRCULATED SAMPLE
1530	3.0	POH (DROPPED SURVEY - TOTCO MISRUN)
1830	3.0	RIH WITH CORE BARREL
2130	0.5	WASH & REAM 1771-1777M
2200	0.5	CIRCULATED
2230	1.5	DROPPED BALL. CUT NO.2 CORE

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	3.5	96.0
3. Reaming	0.5	7.5
4. Coring	3.0	14.5
5. Circ.& Cond	5.0	15.5
6. Trips	12.0	30.0
7. Repair Rig		2.5
8. Rig Maint.		1.5
9. Dev.Survey		8.0
10.Log & Perf		
11.RU Run Csg.Tub		8.5
12.Cementing		2.5
13.NU,Test BOPCsg		14.5
14.PU/LD,DP/DC		
15.DST		
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		0.5
25.D/H Trouble		
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	217.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J E OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 14/10 Report No. 11 Date 19/3/89

2 Total Depth 1802 m Progress 23m Last csg 13 3/8"@ 314 m. Logged to - m

3 Current Activity CIRCULATING SAMPLE

4 Dev/Depth - °@ - m; - ° @ - m; - ° @ - m. LAST BOP TEST 12/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
	RR4	Reed	HP51a	8 1/2"	BT4862	11,2x12	1802	8	1.0	8.0	1.1.I
6	RRCH1	Chr'tn	RC476	8 1/2"	1440532	-	1794	17	12.0	1.4	25% worn

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	RR4	30	60	8.5	6	120	367	1600	300	375	342	254	74	-	2.15
8	RRCH1	10	80	8.5	6"	84	257	500	210	-	75	-	-		

9 BHA Description: BIT-BIT SUB- 14 X 6 1/2" DC'S-DRILLING JARS-1X 6 1/2" DC-6 HWDP (112 HOURS ON JARS)

10 WELL COSTS: Daily$ 25214 Cum$ 536,763 MUD: Daily$ 1572 Cum$ 21053

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.2	42	10	15	2/7	6.6	1	-	10.0	.2/.65	-	100	20K	17.5	6.0	Tr	250	2.5	-

Mud Matl's Used: 30 KCL, 1 CAUSTIC, 11 PAC

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
			-	440	-	671	2660	20260

14 POB: Oper 3 Contr 14 Service GEOD 2, HALLI 3, MI 1, CE 1 , JVP 2 Total 26

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	2.0	CUT CORE NO.2
0200*	1.0	ADJUST TIME FOR END OF DAYLIGHT SAVING - CONTINUE CUT CORE NO.2.
0200	8.5	CUT CORE NO.2 (1777.0-1793.9M)
1030	2.5	POH CHAIN OUT
1300	1.5	RECOVERED 16.8M (99%) CORE.SERVICED BARREL & STOOD BACK IN DERRICK
1430	1.0	WAITED ON ORDERS
1530	0.5	PICKED UP 8 1/2" BIT & RIH TO SHOE
1600	0.5	SLIPPED DRILLING LINE
1630	2.0	FINISHED RIH
1830	0.5	DRILLED TO 1897M
1900	2.5	CIRCULATED SAMPLE
2130	0.5	DRILLED TO 1802M
2200	2.0	CIRCULATED SAMPLE

* NOTE TIME ADJUSTMENT

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	1.0	97.0
3. Reaming		7.5
4. Coring	13.0	27.5
5. Circ.& Cond	4.5	20.0
6. Trips	5.0	35.0
7. Repair Rig		2.5
8. Rig Maint.	0.5	2.0
9. Dev.Survey		8.0
10.Log & Perf		
11.RU Run Csg.Tub		8.5
12.Cementing		2.5
13.NU,Test BOPCsg		14.5
14.PU/LD,DP/DC		
15.DST		
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc	1.0	1.0
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		0.5
25.D/H Trouble		
26.Surf.Trouble		1.5
27.CUM TOTAL	25.0	242.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J. F. OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 15/11 Report No. 12 Date 20/3/89

2 Total Depth - 1802m Progress - Last csg 13 3/8"@ 314 m. Logged to - m

3 Current Activity SLIP & CUT DRILLING LINE

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 12/3/89

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
RR4	REED	HP51A	8 1/2"	BT4862	3X11	-	-	-	-	

6

Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

7

8

9 BHA Description: BIT-NBR- 6 1/2" MONEL-STAB- 2X6 1/2" DC'S-STAB- 17 X 6 1/2" DC'S-
DAILY DRILLING JAR- 1 X 6 1/2" DC X 6 X HWDP (112 HRS ON JARS)

10 WELL COSTS: Daily$ 23,887 Cum$ 568,512 MUD: Daily$ 182 Cum$ 21,237

11

WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
9.2	42	11	16	2/5	6.8	1	-	10.0	.2	.6	80	22K	17.5	5.5	TR	250	2.6	-

Mud Matl's Used: 2 PAC

13

WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
Used	Bal	Used	Bal	Used	Bal	Used	Bal
			440	-	671		35020

14 POB: Oper 3 Contr 14 Service JVP 2;GEOD 2,HALLI 3,MI 1, CE 1 GHRT 4 Total 30

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	0.5	DROPPED SURVEY.PUMPED KCL PILL
0030	2.5	POH.RECOVERED SURVEY - MISRUN
0300	1.5	MADE UP TOOLS FOR DST #1 (1775.2-1802.3M)
0430	2.5	RIH
0700	0.5	HEAD UP FOR TEST
0730	9.5	DST#1 -
		OPEN AT 0730 (7 MIN PREFLOW)
		CLOSED AT 0737 (1/2HR SHUTIN)
		REOPEN AT 0807 (3 HR FLOW)
		CLOSED AT 11.07 (6HR SHUTIN)
		PULLED FREE 1707
		WEAK AIR BLOW - NGTS
1700	3.5	POH WITH TEST TOOLS (PICKED UP EXTRA 2000LBS STRING WEIGHT - PULLED DRY). RECOVERED 299M (10.25BBL) MUDDY WATER.
2030	1.5	LAID DOWN TEST TOOLS
2200	1.5	MADE UP 8 1/2" BIT & STABILISED BHA & RIH TO SHOE
2330	0.5	SLIP & CUT DRILLING LINE

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling		97.0
3. Reaming		7.5
4. Coring		27.5
5. Circ.& Cond	0.5	20.5
6. Trips	4.0	39.0
7. Repair Rig		2.5
8. Rig Maint.	0.5	2.5
9. Dev.Survey		8.0
10.Log & Perf		
11.RU RunCsg,Tub		8.5
12.Cementing		2.5
13.NU,Test BOPCsg		14.5
14.PU/LD,DP/DC		
15.DST	19.0	19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		1.0
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		0.5
25.D/H Trouble		5.0
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	266.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J. E. OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 16/12 Report No. 13 Date 21/3/89

2 Total Depth 1869 m Progress 67m Last csg 13 3/8" @ 314 m. Logged to - m

3 Current Activity LOGGING (RUNNING FIRST LOG - DLL/SFL/GR)

4 Dev/Depth 1/2° @ 1802m; 1 ° @ 1850m; - ° @ m. LAST BOP TEST 12/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
	RR4	REED	HP51A	8 1/2"	BT4862	3X11	1869	67	9	7.4	2.2.I
6											

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	RR4	30	60	8 1/2"	6	100	306	1425	58	352	254	182	72	-	1.55
8		40							250						

9 BHA Description:

10 WELL COSTS: Daily$ 54,252 Cum$ 623,012 MUD: Daily$ 1388 Cum$ 22,625

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.2	43	12	17	2/7	6.5	1	-	9.7	.15	.50	100	22K	17.5	5.5	TR	200	2.7	-

Mud Matl's Used: 1 CAUSTIC, 9 PAC, 30 KCL

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				440	-	671	2750	32270

14 POB: Oper 2 Contr 14 Service GEOD 2;HALLI 3;MI 1;GHRT 4 Total 26

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	0.5	SLIP & CUT DRILLING LINE
0030	1.5	WORK ON WEIGHT INDICATOR DIAPHRAGM
0200	1.5	RIH
0330	0.5	WASH & REAM 3M FILL TO BOTTOM
0400	0.5	CIRCULATED
0430	0.5	RAN SURVEY - MISRUN
0500	3.0	DRILLED TO 1821M
0800	0.5	CIRCULATED & RAN SURVEY
0830	2.5	DRILLED TO 1840M
1100	2.0	CIRCULATED SAMPLE
1300	3.5	DRILLED TO 1869M
1630	2.0	CIRCULATED BOTTOMS UP
1830	2.5	PUMPED KCL PILL.DROPPED SURVEY POH.
2100	3.0	RIGGED UP GEARHART. RAN DLL/ MSFL/GR. LOGGERS DEPTH 1859.5M (ON FILL)

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	9.0	106.0
3. Reaming	0.5	8.0
4. Coring		27.5
5. Circ.& Cond	4.5	25.0
6. Trips	4.0	43.0
7. Repair Rig	1.5	4.0
8. Rig Maint.	0.5	3.0
9. Dev.Survey	1.0	9.0
10.Log & Perf	3.0	3.0
11.RU RunCsg,Tub		8.5
12.Cementing		2.5
13.NU,Test BOPCsg		14.5
14.PU/LD,DP/DC		
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		1.0
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		0.5
25.D/H Trouble		5.0
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	290.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J.F. OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 17/13 Report No. 14 Date 22/3/89

2 Total Depth - 1869m Progress Nil Last csg 13 3/8"@ 314 m. Logged to 1859.5m

3 Current Activity OPENING HOLE FROM 8 1/2" TO 12 1/4"

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 12/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	5	REED	FP31G	12 1/4"	NRC069	2X14,22	-	36	3.5	10.3	
6	HOLE OPENING										

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	5	15	80	8 1/2"	6	120	682	2300	129	326	915	352	38	-	-
8		25	90	15	6	50			194						

9 BHA Description: BIT-BIT SUB-2 X 8" DC'S-STAB- 1 X 8" DC-XO- 16 X 6 1/2" DC'S JARS 1X6 1/2" DC- 6 X HWDP

10 WELL COSTS: Daily$ 26,631 Cum$ 649,643 MUD: Daily$ 58 Cum$ 22683

11	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
	9.2	41	11	14	2/5	6.4	1	-	8.8	.05	.4	180	21K	17.5	5.6	TR	200	2.7	-

Mud Matl's Used: 2 CAUSTIC

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				440	-	670	1850	30420

14 POB: Oper 2 Contr 14 Service GEOD 2,HALLI 3; MI 1,GHRT 4 Total 26

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	10.0	LOGGING- FINISHED RUNNING DLL/MSFL/GR RIGGED DOWN GEARHART
1000	1.5	RIGGED UP HALLIBURTON LINES & RAN FIT:LEAKED OFF AT 380PSI WITH 9.2 PPG MUD. (CASING AT 314M, OPEN HOLE TO 1869M
1130	2.0	WAITED ON ORDERS (LAID DOWN 8" MONEL)
1330	3.0	MADE UP HOLE OPENING ASSEMBLY & RIH
1630	2.5	LIGHTLY REAMED & WASHED TIGHT HOLE 1063M - 1086M 1140M - 1172M 1245M - 1254M
1900	1.0	FINISHED RIH
2000	0.5	REAM & WASH 13M TO TOP OF 8 1/2" OH @ 1744M
2030	3.5	OPENED 8 1/2" HOLE TO 12 1/4", @ 1780M

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling		106.5
3. Reaming	3.5	11.5
4. Coring		27.5
5. Circ.& Cond	0.5	25.5
6. Trips	4.0	47.0
7. Repair Rig		4.0
8. Rig Maint.		3.0
9. Dev.Survey		9.0
10.Log & Perf	10.0	13.0
11.RU RunCsg,Tub		8.5
12.Cementing		2.5
13.NU,Test BOPCsg		14.5
14.PU/LD,DP/DC		
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc 2.0		3.0
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT	1.5	2.0
25.D/H Trouble	2.5	7.5
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	314.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J E OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO 2 DOL/DSS 18/14 Report No. 15 Date 23/3/89

2 Total Depth - 1869m Progress Nil Last csg 13/3/8"@ 314 m. Logged to 1859m m

3 Current Activity RUNNING 9 5/8" CASING

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 12/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
	5	REED	FP31G	12 1/4"	NRC069	2X14,22	1869	125	15.5	8.1	2.2.I
6	HOLE OPENING										

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	5	15	80	8 1/2"	6	120	576	2300	109	275	478	211	44	-	1.79
8		25	90	15	5	50									

9 BHA Description: BIT-BIT SUB- 2 X 8" DC'S STAB- 1X 8" DC-XO- 16 X 61/2"DC'S
JARS- 1 X 6 1/2" DC- 6 X HWDP

10 WELL COSTS: Daily$ 17,424 Cum$ 667,067 MUD: Daily$ 1415 Cum$ 24098

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.3	39	13	12	2/5	6.8	1	-	9.1	.1	.4	140	21K	17.5	6.3	TR	200	2.7	-

Mud Matl's Used: 3 CAUSTIC, 30 KCL,(STOCK ADJUSTMENT: 5 MAGCOGEL
2 SODA ASH, 11 POLYSAL, 1 LIME, 2 PAC)

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
			-	440		670	-	35840

14 POB: Oper 2 Contr 14 Service GEOD 2, HALLI 1, MI 1 Total 22

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	12.0	OPENED 8 1/2" HOLE TO 12 1/4"
1200	1.5	CIRCULATED HOLE CLEAN
1330	3.0	POH
1630	1.0	LAID DOWN 8" COLLARS
1730	2.5	RIGGED TO RUN CASING, PULLED WEAR BUSHING
2000	4.0	RAN 9 5/8" INTERMEDIATE CASING

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling		106.0
3. Reaming		23.5
4. Coring		27.5
5. Circ.& Cond	1.5	27.0
6. Trips	3.0	50.0
7. Repair Rig		4.0
8. Rig Maint.		3.0
9. Dev.Survey		9.0
10.Log & Perf		13.0
11.RU RunCsg,Tub	6.5	8.5
12.Cementing		2.5
13.NU,Test BOPCsg		14.5
14.PU/LD,DP/DC	1.0	1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		3.0
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		2.0
25.D/H Trouble		7.5
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	338.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J.E. OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 19/15 Report No. 16 Date 24/3/89

2 Total Depth - 1869m Progress NIL Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity PREPARING TO INSTALL CASING SPOOL

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 12/3/89

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
–	–	–	–	–	–	–	–	–	–	

6

Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

7

8

9 BHA Description:

10 WELL COSTS: Daily$ 257,519 Cum$ 924,586 MUD: Daily$ NIL Cum$ 24098

11

WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
9.3	39	13	12	2/5	6.8	1	-	9.1	.1	.4	140	21K	17.5	6.3	TR	200	2.7	-

Mud Matl's Used: CEMENT MATERIALS: 56 MAGCOGEL, 6 HALAD 322; 925SX "G" CLASS CEMENT

13

WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
Used	Bal	Used	Bal	Used	Bal	Used	Bal
			-	440	925		35840

14 POB: Oper 1 Contr 15 Service GEOD 1, HALLI 1, MI 1, IDFS 2, JV 1 Total 24

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	10.0	RAN A TOTAL OF 158 JTS 9 5/8" 47LB/FT N80 R3 CASING TO 1867M WITH DV STAGE CEMENTING COLLAR AT 1038M, SHUT OFF BAFFLE AT 1843M & FLOAT COLLAR AT 1855M
1000	1.0	RIGGED UP CIRCULATING HEAD & WASHED 6M FILL
1100	1.0	CIRCULATED CASING CONTENTS
1200	2.0	RIGGED UP CEMENTING HEAD & TESTED LINES TO 3000PSI. CEMENTED FIRST STAGE WITH 266SX CLASS G CEMENT & 1% HALAD 322. BUMPED PLUG WITH 2000PSI AT 13.55 HOURS
1400	0.5	DROPPED OPENING BOMB & OPENED DV COLLAR
1430	1.5	CIRCULATED CASING & PREPARED GEL WATER MIX
1600	2.0	CEMENTED SECOND STAGE WITH 659SX CLASS G & 4.3% PREHYDRATED GEL. BUMPED PLUG WITH 2000PSI & CLOSED DV STAGE COLLAR CIP 1815 HOURS 24/4/89
1800	6.0	LIFTED BOPS, SET CASING SLIPS HUNG CASING & PREPARED TO INSTALL CASING SPOOL
NOTE		INDICATOR BLOCKS TENSION ON SLIPS 290KLB 18KLB 272KLB

OPERATION	DAY	CUM
1. Rig Up/Down		-
2. Drilling		106.0
3. Reaming	1.0	24.5
4. Coring		27.5
5. Circ.& Cond	2.5	29.5
6. Trips		50.0
7. Repair Rig		4.0
8. Rig Maint.		3.0
9. Dev.Survey		9.0
10.Log & Perf		13.0
11.RU RunCsg,Tub	10.0	25.0
12.Cementing	4.5	7.0
13.NU,Test BOPCsg	6.0	20.5
14.PU/LD,DP/DC		1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		3.0
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		2.0
25.D/H Trouble		7.5
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	362.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J E OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 20/16 Report No. 17 Date 25/3/89

2 Total Depth 1869m Progress Nil m Last csg 9 5/8" @ 1867m Logged to 1860 m

3 Current Activity DRILLING OUT STAGE COLLAR

4 Dev/Depth ° @ m; ° @ m; - ° @ m. LAST BOP TEST 25/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	6	REED	HP43A	8 1/2"	P82514	0 10 14					
6			MUDPICK								

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	DRILLING OUT CEMENT														
8															

9 BHA Description: BIT-REAMER-6 1/2" DC'S-STAB-2 X 6 1/2" MONELS-STAB-19 X 6 1/2" DC'S-DAILY DRILLING JARS-1 X 6 1/2" DC- 6XHWDP (137 1/2 HRS ON JARS)

10 WELL COSTS: Daily$ 20861 Cum$ 945,447 MUD: NIL Daily$ Cum$ 24098

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	pH	Pf	Mf	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.3	35	8	7	1/3	8.0	1	-	11.5	.7	1.1	100	22K	15.0	6.4	TR	100	2.8	-

12 Mud Matl's Used: NIL

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				432	400		1560	32930

14 POB: Oper 2 Contr 15 Service GEOD 2;HALLI 2;IDFS 1; JV 1 Total 23

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	3.5	INSTALLED CASING SPOOL. TESTED PACKOFF & RING GASKET TO 3500PSI OK.NIPPLED UP BOPS
0330	5.5	REMOVED 13 3/8"ADAPTOR FROM TEST PLUG. SET PLUG IN CASING SPOOL. RIGGED UP & PRESSURE TESTED BLIND RAMS TO 4000PSI.TESTED HYDRIL TO 1500PSI.TESTED CHOKE MANIFOLD VALVES TO 4000PSI.PIPE RAMS LEAKED
0900	9.5	REPAIRED PIPE RAMS
1830	1.0	PRESSURE TESTED PIPE RAMS TO 4000 PSI.OK.LAID DOWN TEST PLUG & X/OS.
1930	1.0	INSTALLED WEAR BUSHING & LAID DOWN X/OS & RUNNING TOOL
2030	1.0	MADE UP BIT #6 & RIH TO 525M
2130	0.5	SLIPPED DRILLING LINE
2200	1.0	RIH.INSTALLED DP RUBBERS
2300	1.0	TAGGED CEMENT AT 1037M.DRILLED OUT CEMENT & PLUG.DRILLED STAGE COLLAR

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling		106.0
3. Ream/Drillout	1.0	25.5
4. Coring		27.5
5. Circ.& Cond.		29.0
6. Trips	2.0	52.0
7. Repair Rig	9.5	13.5
8. Rig Maint.	0.5	3.5
9. Dev.Survey		9.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg	11.0	31.5
14.PU/LD,DP/DC		1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		3.0
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		2.0
25.D/H.Trouble		7.5
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	386.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J E OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 21/17 Report No. 18 Date 26/3/89

2 Total Depth 1869m Progress Nil m Last csg 9 5/8" @ 1867m Logged to 1860 m

3 Current Activity FINISH PRESSURE TESTING. PREPARE TO START DRILLING CEMENT

4 Dev/Depth ° @ m; ° @ m; - ° @ m. LAST BOP TEST 25/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	6	REED	HP43A	8 1/2"	P82514	0 10 14					
6			MUDPICK								

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7															
8															

9 BHA Description: BIT-REAMER-6 1/2" DC'S-STAB-2 X 6 1/2" MONELS-STAB-19 X 6 1/2" DC'S-DAILY DRILLING JARS-1 X 6 1/2" DC- 6XHWDP (137 1/2 HRS ON JARS)

10 WELL COSTS: Daily$ 15890 Cum$ 961,337 MUD: Daily$ 122 Cum$ 24220

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	pH	Pf	Mf	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

12 Mud Matl's Used: 6 BICARB

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				432	400		2400	30530

14 POB: Oper 2 Contr 15 Service GEOD 2;HALLI 2;IDFS 1; JV 1 Total 23

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	2.0	DRILLED OUT STAGE COLLAR.
0200	2.0	RIH INSTALLING PIPE RUBBERS
0400	2.0	DRILLED OUT OPENING BOMB & SHUT OFF BAFFLE. DRILLED OUT FLOAT COLLAR & CEMENT TO 1857M
0600	1.0	WAITED ON HALLIBURTON TO ARRIVE
0700	1.5	ATTEMPTED TO PRESSURE TEST CASING - PIPE RAMS LEAKED.
0830	15.5	REPAIRED BOP LEAKS -FOUND FAULTY GAUGE ON CONTROL PANEL. INCREASED PIPE RAM CLOSING PRESSURE -ATTEMPTED TO RETEST. LOWER FLANGE OF SPOOL BETWEEN PIPE & BLIND RAMS LEAKED. -POH. LIFTED HYDRIL & BLIND RAMS REPLACED RING GASKET & SHORTENED STUDS INTERFACING WITH SPOOL OUTLETS NIPPLED UP. -RIH WITH BHA & TEST PIPE RAMS/ CASING TO 4000PSI OK. FINISHED RIH (SLIP LINE) & REPEAT PRESSURE TEST OK.

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	.	106.0
3. Ream/Drillout	4.0	29.5
4. Coring		27.5
5. Circ.& Cond.		29.0
6. Trips	2.0	54.0
7. Repair Rig	15.5	29.0
8. Rig Maint.		3.5
9. Dev.Survey		9.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg	1.5	33.0
14.PU/LD,DP/DC		1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc	1.0	4.0
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		2.0
25.D/H Trouble		7.5
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	410.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J E OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 22/18 Report No. 19 Date 27/3/89

2 Total Depth 2008m Progress 139 m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity DRILLING 8 1/2" HOLE.

4 Dev/Depth 1/2° @ 1936m; ° @ m; - ° @ m. LAST BOP TEST 26/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	6	REED	HP43A	8 1/2"	P82514	0,10,14	-	139	21.0	6.6	
6											

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	6	35	70	8 1/2	6	96	288	1875	136	406	314	228	73	375	4.02
8		40	85						235						

9 BHA Description: BIT-REAMER- 61/2" MONEL-STAB-2X6 1/2" DC'S-STAB-19 X 6 1/2" DC'S-DAILEY DRILLING JARS-1 X 6 1/2" DC-6XHWDP (158.5 HOURS ON JARS)

10 WELL COSTS: Daily$ 15,923 Cum$ 977,260 MUD: Daily$ 139 Cum$ 24359

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	pH	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.4	32	5	3	1/2	10.2	1	-	10.0	.2/.5	1.3	360	19K	20.0	7.3	TR	150	2.4	-

12 Mud Matl's Used: 2 SODIUM NITRATE, 2 SODIUM SULFITE (Corrosion Control)

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				432		400	3260	27270

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1;JVP 1; Total 21

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	1.5	DRILLED OUT CEMENT AND SHOE
0130	0.5	DRILLED TO 1872M
0200	1.0	CIRCULATED & RAN LEAK OFF TEST LEAKED OFF WITH 1100PSI/9.2PPG MUD-EMW 12.7PPG
0300	12.5	DRILLED TO 1955M
1530	0.5	RAN SURVEY
1600	8.0	DRILLED TO 2008M

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	21.0	127.0
3. Ream/Drillout	1.5	31.0
4. Coring	-	27.5
5. Circ.& Cond.		29.5
6. Trips		54.0
7. Repair Rig		29.0
8. Rig Maint.		3.5
9. Dev.Survey	0.5	9.5
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		33.0
14.PU/LD,DP/DC		1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.0
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT	1.0	3.0
25.D/H Trouble		7.5
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	436.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 23/19 Report No. 20 Date 28/3/89

2 Total Depth 2172m Progress 164 m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity DRILLING 8 1/2" HOLE.

4 Dev/Depth 3/4° @ 2089m; ° @ m; - ° @ m. LAST BOP TEST 26/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	6	REED	HP43A	8 1/2"	P82514	0,10,14	-	303	44.0	6.9	
6											

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	6	40	20	8 1/2	6	96	288	1750	136	406	293	208	71	325	3.67
8									235						

9 BHA Description: BIT-REAMER- 61/2" MONEL-STAB-2X6 1/2" DC'S-STAB-19 X 6 1/2" DC'S-DAILEY DRILLING JARS-1 X 6 1/2" DC-6XHWDP (181.5 HOURS ON JARS)

10 WELL COSTS: Daily$ 15,341 Cum$ 992,723 MUD: Daily$ 70 Cum$ 24429

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	pH	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.3	33	6	4	1/2	11.2	1	-	9.5	.2/.5	-	440	17.5K	20	6.6	Tr	100	2.2	-
	8.4	26	-	-	-	40	-	-	8.5	Tr/.5	-	460	9K	-	-	Tr	100	0.8	

12 Mud Matl's Used: 1 SODIUM NITRATE, 1 SODIUM SULFITE

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				432		400	4050	23220

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1;JVP 1; Total 21

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	14.5	DRILLED TO 2089M
1430	0.5	FLOWCHECK & CIRCULATE SAMPLE
1500	2.0	DRILLED TO 2018M
1700	0.5	CIRCULATED & RAN SURVEY
1730	6.6	DRILLED TO 2172M

OPERATION	DAY	CUM
1. Rig Up/Down		
2. Drilling	23.0	150.0
3. Ream/Drillout		31.0
4. Coring		27.5
5. Circ.& Cond.	0.5	30.5
6. Trips		54.0
7. Repair Rig		29.0
8. Rig Maint.		3.5
9. Dev.Survey	0.5	10.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		33.0
14.PU/LD,DP/DC		1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.0
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		7.5
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	458.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 24/20 Report No. 21 Date 29/3/89

2 Total Depth 2272m Progress 100 m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity DRILLING 8 1/2" HOLE.

4 Dev/Depth 1.5° @ 2245m; ° @ m; - ° @ m. LAST BOP TEST 26/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	6	REED	HP43A	8 1/2"	P82514	0,10,14	2261	392	54.0	7.3	2.2.1/I
6	7	LONGYEAR	DP13	8 1/2"	28509	6X9	-	11	2.5	4.4	-

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	6	40	70	8 1/2	6	96	288	1775	136	406	298	208	70	350	3.67
8	7	10	85	8 1/2	6	105	317	1125	150	273	208	104	50	425	1.83

9 BHA Description: PDC BIT-NB REAMER-MONEL-STAB-2X6 1/2" DC'S-STAB-10 X 6 1/2" DC'S-DAILEY DRILLING JARS-1 X 6 1/2" DC-6XHWDP

10 WELL COSTS: Daily$ 28,407 Cum$ 1,021,130 MUD: Daily$ 92 Cum$ 24520

11	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	pH	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
PITS	9.2	33	7	4	1/1	12.0	1	-	9.0	Tr/.3	-	440	15.5K	17.5	6.3	Tr	100	1.9	-
HOLE	8.4	26	-	-	-	-	-	-	7.5	0 /.5	-	520	9K	-	-	-	100	0.8	

12 Mud Matl's Used: 1 PAC

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				432		400		29800

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1;JVP 1; LONGYEAR 1 Total 22

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	10.0	DRILLED TO 2261M
1000	0.5	DROPPED SURVEY & PUMPED PILL
1030	3.5	POH
1400	2.5	CHANGED BIT. RIH TO SHOE
1630	3.5	SLIPPED & CUT LINE. STRUNG 10 LINES
2000	1.5	FINISHED RIH. WASHED 4M FILL
2130	2.5	DRILLED TO 2272M

OPERATION	DAY	CUM
1. Rig Up/Down	3.5	3.5
2. Drilling	12.5	162.5
3. Reaming		31.0
4. Coring		27.5
5. Circ.& Cond.		30.5
6. Trips	7.5	61.5
7. Repair Rig		29.0
8. Rig Maint.		3.5
9. Dev.Survey	0.5	10.5
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		33.0
14.PU/LD,DP/DC		1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.0
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		7.5
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	482.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J E OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 25/21 Report No. 22 Date 30/3/89

2 Total Depth 2385m Progress 113 m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity DRILLING 8 1/2" HOLE.

4 Dev/Depth 1.25° @ 2298m; ° @ m; - ° @ m. LAST BOP TEST 26/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	7	LONGYEAR	DP13	8 1/2"	28509	6X9	3217	56	9	6.2	5%WORN
6	8	VAREL	V437	8 1/2"	840900	0 10 14	-	68	9	7.6	-

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	7	15	80	8 1/2	6	105	317	1115	150	273	208	104	50	425	1.83
8	8	40	70	8 1/2	6	100	300	1800	141	423	314	235	75	400	4.15

9 BHA Description: PDC BIT-NB REAMER-MONEL-STAB-2X6 1/2" DC'S-STAB-19 X 6 1/2" DC'S-DAILEY DRILLING JARS-1 X 6 1/2" DC-6XHWDP

10 WELL COSTS: Daily$ 20,461 Cum$ 1,041,159 MUD: Daily$ NIL Cum$ 24520

11	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	pH	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
PITS	9.2	34	7	3	1/1	13.0	1	-	9.0	Tr/.3	-	440	15.5K	15	6.3	-	100	1.9	-
HOLE	8.4	26	-	-	-	-	-	-	7.5	0 /.2	-	560	8.5K	-	-	-	100	0.8	

12 Mud Matl's Used: NIL

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				432		400	2620	27180

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; Total 20

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	6.5	DRILLED TO 2317M
0630	0.5	CIRCULATED, DROPPED SURVEY, PUMPED PILL
0700	3.5	POH FOR BIT CHANGE
1030	0.5	TURNED REAMER PINS. PICKED UP BIT NO.8
1100	4.0	RIH. NO FILL.
1500	9.0	DRILLED TO 2385M

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	15.5	178.0
3. Reaming		31.0
4. Coring		27.5
5. Circ.& Cond.		30.5
6. Trips	7.5	69.0
7. Repair Rig		29.0
8. Rig Maint.		3.5
9. Dev.Survey	0.5	11.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		33.0
14.PU/LD,DP/DC		1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc	0.5	4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		7.5
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	506.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J. F. OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 26/22 Report No. 23 Date 31/3/89

2 Total Depth 2482m Progress 97 m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity DRILLING 8 1/2" HOLE.

4 Dev/Depth 2.5 °@ 2442m; ° @ m; – ° @ m. LAST BOP TEST 26/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	8	VAREL	V437	8 1/2"	840900	0 10 14	2403	86	11.5	7.5	1 1 I
6	9	REED	S13G	8 1/2"	BT1853	0 10 14	-	79	12.5	6.3	-

BIT NO 9 WASHED OUT JET RECESS.

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	8	40	70	8 1/2	6	100	300	1800	147	423	314	235	75	350	4.15
8	9	-	-	8 1/2	6	105	317	2075	148	444	380	272	72	390	4.80

9 BHA Description: BIT-NB REAMER-MONEL-STAB-2X6 1/2" DC'S-STAB-19 X 6 1/2" DC'S-DAILEY DRILLING JARS-1 X 6 1/2" DC-6XHWDP

10 WELL COSTS: Daily$ 17,532 Cum$ 1,059,483 MUD: Daily$ NIL Cum$ 24520

11	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	pH	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
PITS	9.2	33	6	3	1/1	13.8	1	-	9.0	Tr/.3	-	440	15K	15	6.3	-	100	1.8	-
HOLE	8.4	26	-	-	-	-	-	-	7.5	0 /.3	-	680	9K	-	-	-	50	0.7	

12 Mud Matl's Used: NIL

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				432		400	3180	24000

14 POB: Oper 2 Contr 16 Service GEOD 2;IDFS 1;HALLI 1;JVP 1 Total 23

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	2.5	DRILLED TO 2403M.LOW/ERRATIC PUMP PRESSURE.
0230	0.5	CHECKED SURFACE EQUIPMENT.OK.
0300	4.5	POH LOOKING FOR WASHOUT.FOUND BIT NOZZLE RECESS WASHED OUT AROUND CIRCLIP & 'O'RING (LOST 10/32 JET)
0730	3.5	CHANGED BIT & RIH
1100	9.0	DRILLED TO 2460M
2000	0.5	CIRCULATED & RAN SURVEY
2030	3.5	DRILLED TO 2482M

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	15.0	193.0
3. Reaming		31.0
4. Coring		27.5
5. Circ.& Cond.		30.5
6. Trips		69.0
7. Repair Rig		29.0
8. Rig Maint.		3.5
9. Dev.Survey	0.5	11.5
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		33.0
14.PU/LD,DP/DC		1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble	8.5	16.0
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	530.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J.F. OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 27/23 Report No. 24 Date 1/4/89

2 Total Depth 2603m Progress 121m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity POH FOR BIT CHANGE

4 Dev/Depth 2 °@ 2542m; 2 ° @ 2588 m; - ° @ m. LAST BOP TEST 26/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	9	REED	S13G	8 1/2"	BT1853	0 10 14	2603	200	32.0	6.3	5 7 I
6	-	-	-	-	-	-	-	-	-	-	-

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	9	40	70	8 1/2	6	105	317	2075	148	444	380	272	72	390	4.80
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

9 BHA Description: BIT-NB REAMER-MONEL-STAB-2X6 1/2" DC'S-STAB-19 X 6 1/2" DC'S-DAILEY DRILLING JARS-1 X 6 1/2" DC-6XHWDP (244HRS ON JARS)

10 WELL COSTS: Daily$ 15,060 Cum$ 1,074,543 MUD: Daily$ NIL Cum$ 24520

11	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	pH	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
PITS	9.4	32	7	3	1/1	14.5	1	-	9.0	Tr/.3	-	480	14.5K	15	6.0	-	100	1.6	-
HOLE	8.4	26	-	-	-	-	-	-	7.5	0 /.2	-	680	8.5K	-	-	-	50	0.7	

12 Mud Matl's Used: NIL

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				432		400	3500	20500

14 POB: Oper 2 Contr 16 Service GEOD 2;IDFS 1; JVP 1 Total 22

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	11.5	DRILLED TO 2556M
1130	0.5	RAN SURVEY
1200	8.0	DRILLED TO 2603M
2000	0.5	DROPPED SURVEY, PUMPED PILL
2030	3.5	POH FOR BIT CHANGE

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	19.5	212.5
3. Reaming		31.0
4. Coring		27.5
5. Circ.& Cond.		30.5
6. Trips	3.5	72.5
7. Repair Rig		29.0
8. Rig Maint.		3.5
9. Dev.Survey	1.0	12.5
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		33.0
14.PU/LD,DP/DC		1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		16.0
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	554.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J. E. OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 27/24 Report No. 25 Date 2/4/89

2 Total Depth 2737m Progress 134m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity DRILLING 8 1/2" HOLE

4 Dev/Depth 2 °@ 2699m; ° @ m; - ° @ m. LAST BOP TEST 26/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	10	REED	HP43A	8 1/2"	79454	0 10 13	-	134	18.0	7.4	-
6	-	-	-	-	-	-	-	-	-	-	-

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	10	40	70	8 1/2	6	100	300	2200	141	466	384	285	74	-	5.02
8	-	-	-	15	5	-	-	-	-	-	-	-	-	-	-

9 BHA Description: BIT-NB REAMER-MONEL-STAB-2X6 1/2" DC'S-STAB-19 X 6 1/2" DC'S-DAILEY DRILLING JARS-1 X 6 1/2" DC-6XHWDP (262.5HRS ON JARS)

10 WELL COSTS: Daily$ 20818 Cum$ 1,095,361 MUD: Daily$ 40 Cum$ 24560

11	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	pH	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
HOLE	8.4	26	-	-	-	-	-	-	7.0	0 /.3	-	240	12K	-	-	-	100	-	-

12 Mud Matl's Used: 1 NITRATE

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				432		400	2500	18000

14 POB: Oper 2 Contr 16 Service GEOD 2;IDFS 1; JVP 1 Total 22

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	0.5	FINISHED POH
0030	1.0	CHANGED BIT. RIH WITH BHA
0130	0.5	SLIPPED DRILLING LINE
0200	3.0	RIH.STRAPPED PIPE - NO CORRECTION
0500	14.0	DRILLED TO 2699M
1900	0.5	REPAIRED WEIGHT INDICATOR LINES/ LEAKS
1930	2.0	DRILLED TO 2718M
2130	0.5	CIRCULATED & RAN SURVEY
2200	2.0	DRILLED TO 2737M

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	18.0	230.5
3. Reaming		31.0
4. Coring		27.5
5. Circ.& Cond.		30.5
6. Trips	4.5	77.0
7. Repair Rig	0.5	29.5
8. Rig Maint.	0.5	4.0
9. Dev.Survey	0.5	13.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		33.0
14.PU/LD,DP/DC		1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		16.0
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	578.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J F OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 29/25 Report No. 26 Date 3/4/89

2 Total Depth 2881m Progress 144m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity CIRCULATE & WORK PIPE (TIGHT HOLE ON CONNECTION)

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 26/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	10	REED	HP43A	8 1/2"	79454	0 10 13	-	278	38.5	7.2	-
6	-	-	-	-	-	-	-	-	-	-	-

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	10	40	70	8 1/2	6	100	300	2200	141	466	384	285	74	-	5.02
8	-	-	-	15	5	65	-	-	-	-	-	-	-	-	-

9 BHA Description: BIT-NB REAMER-MONEL-STAB-2X6 1/2" DC'S-STAB-19 X 6 1/2" DC'S-DAILEY DRILLING JARS-1 X 6 1/2" DC-6XHWDP (283 HRS ON JARS)

10 WELL COSTS: Daily$ 18,090 Cum$ 1,113,450 MUD: Daily$ 1891 Cum$ 26,412

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	pH	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	8.5	30	5	2	1/1	11.5	1	-	9.0	.1/.3	-	200	1.4K	2.5	1.6	Tr	250	-	-

12 Mud Matl's Used: 18 PAC, 3 NITRATE, 3 SULFITE, 1 CAUSTIC

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				432		400	3650	14350

14 POB: Oper 2 Contr 16 Service GEOD 2;IDFS 1; JVP 1;HALL 1;EAST 1 Total 24

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	5.0	DRILLED TO 2775M
0500	1.0	CIRCULATED & WORKED PIPE (TIGHT HOLE ON CONNECTION).PUMPED HV PILL. NO BUILD UP OF CUTTINGS.
0600	1.5	REPAIRED NO.1 PUMP
0730	15.5	DRILLED TO 2881M
2300	1.0	CIRCULATED & WORKED PIPE (TIGHT HOLE ON CONNECTION AFTER DRILLING WITH REDUCED GPM DUE TO PROBLEMS NO.1 PUMP)

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	20.5	251.0
3. Reaming		31.0
4. Coring		27.5
5. Circ.& Cond.		30.5
6. Trips		77.0
7. Repair Rig	1.5	31.0
8. Rig Maint.		4.0
9. Dev.Survey		13.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		33.0
14.PU/LD,DP/DC		1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble	2.0	18.0
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	602.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J. E. OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 30/26 Report No. 27 Date 4/4/89

2 Total Depth 2981m Progress 100m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity DRILLING 8 1/2" OH

4 Dev/Depth 2 °@ 2878m; ° @ m; - ° @ m. LAST BOP TEST 26/3/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	10	REED	HP43A	8 1/2"	79454	0 10 13	-	378	55.0	6.9	-
6	-	-	-	-	-	-	-	-	-	-	-

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	10	40	70	8 1/2	6	100	300	2250	141	466	393	292	74	450	5.14
8	-	-	-	-	-	-	-	-	245	-	-	-	-	-	-

9 BHA Description: BIT-NB REAMER-MONEL-STAB-2X6 1/2" DC'S-STAB-19 X 6 1/2" DC'S-DAILEY DRILLING JARS-1 X 6 1/2" DC-6XHWDP (299.5HRS ON JARS)

10 WELL COSTS: Daily$ 34,278 Cum$ 1,147,728 MUD: Daily$ 2118 Cum$ 28,569

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	pH	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	8.6	30	4	2	1/1	8.5	1	-	10.0	.4/.9	-	20	1.5K	6.0	2.4	Tr	Tr	-	-

12 Mud Matl's Used: 14 PAC, 2 SODIUM SULFITE, 4 CAUSTIC, 16 POLYSAL

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				432		400	-	29841

14 POB: Oper 2 Contr 16 Service GEOD 2;IDFS 1; JVP 1;HALL 1;EAST 1 Total 24

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	0.5	RAN SURVEY - MISRUN
0030	4.0	DRILLED TO 2903M
0430	3.5	LOST PRESSURE.CHECKED SURFACE EQUIPMENT.POH LOOKING FOR WASHOUT. (FOUND W/O IN SLIP AREA/DP @ 1721M)
0800	1.0	MADE UP KELLY & CHECKED PRESSURE. OK. SLIPPED & CUT DRILLING LINE
0900	2.0	RIH
1100	0.5	RAN SURVEY
1130	12.5	DRILLED TO 2981M

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	16.5	267.5
3. Reaming		31.0
4. Coring		27.5
5. Circ.& Cond.		30.5
6. Trips		77.0
7. Repair Rig		31.0
8. Rig Maint.	1.0	5.0
9. Dev.Survey	1.0	14.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		33.0
14.PU/LD,DP/DC		1.0
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble	5.5	23.5
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	626.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J.E. OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 31/27 Report No. 28 Date 5/4/89

2 Total Depth 3042m Progress 61m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity DRILLING 8 1/2" OH

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
5	10	REED	HP43A	8 1/2"	79454	0 10 13	3005	402	60.0	6.7	6.8.1/1
6	RR4	REED	HP51A	8 1/2"	BT4862	0 10 13	-	37	5.5	6.7	-BT

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	10	40	70	8 1/2	6	100	300	2250	141	466	393	292	74	350	5.14
8	RR4	40	75	8 1/2	6	100	300	2550	141	466	410	292	71	350	5.14

9 BHA Description: BIT-JUNK SUB-NB REAMER-MONEL-STAB-2X6 1/2" DC'S-STAB-19 X 6 1/2" DC'S-DAILEY DRILLING JARS-1 X 6 1/2" DC-6XHWDP-242E-REST G PIPE(310 HRS ON JARS)

10 WELL COSTS: Daily$ 21,360 Cum$ 1,169,088 MUD: Daily$ 663 Cum$ 29,232

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	8.8	30	4	2	1/2	7.8	1	-	9.5	.2/.6	1.1	40	1.4K	6.0	3.5	Tr	50	-	-

12 Mud Matl's Used: 12 POLYSAL, 1 CAUSTIC, 3 NITRATE

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				432		400	6800	23060

14 POB: Oper 2 Contr 16 Service GEOD 2;IDFS 1; JVP 1;HALL 1;EAST 1 Total 24

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	5.0	DRILLED TO 3005M
0500	6.0	LOST PRESSURE.CHECKED SURFACE EQUIPMENT.POH LOOKING FOR WASHOUT FOUND WASHOUT IN BIT AT WELD BETWEEN NO 1 AND 3 CONES.
1100	0.5	BROKE OF BIT. LAID DOWN REAMER & REPLACED PINS AND CUTTERS.
1130	3.0	PULLED WEAR BUSHING.RAN TEST PLUG. PRESSURE TESTED PIPE RAMS, BLIND RAMS, CHOKE LINES & VALVES TO 4000PSI. HYDRIL TO 1500PSI. LAID DOWN TEST PLUG & INSTALLED WEAR BUSHING.
1430	3.5	RIH, REPLACED LOWER STABILISER. CONTINUED RIH.
1800	0.5	BROKE CIRCULATION. WASHED 15M AS A PRECAUTION AND WORKED JUNK SUB.
1830	5.5	DRILLED TO 3042M

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	10.5	278.0
3. Reaming		30.5
4. Coring		27.5
5. Circ.& Cond.	0.5	30.5
6. Trips	9.5	86.5
7. Repair Rig		31.0
8. Rig Maint.		5.0
9. Dev.Survey		14.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg	3.0	36.0
14.PU/LD,DP/DC	0.5	1.5
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		24.0
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	650.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J. E. OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 32/28 Report No. 29 Date 6/4/89

2 Total Depth 3182m Progress 140m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity DRILLING 8 1/2" OH

4 Dev/Depth 4 °@ 3045m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

6

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
RR4	REED	HP51A	8 1/2"	BT4862	0 10.13	-	177	28.5	6.2	

7

Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
RR4	40	75	8 1/2"	6	100	300	2350	141	466	410	305	74	-	5.38

8

9 BHA Description: BIT-JUNK SUB-NB REAMER-MONEL-STAB-2X6 1/2" DC'S-STAB-19 X 6 1/2" DC'S-DAILEY DRILLING JARS-1 X 6 1/2" DC-6XHWDP-242E-REST G PIPE(333 HRS ON JARS)

10 WELL COSTS: Daily$ 17,177 Cum$ 1,186,265 MUD: Daily$ 978 Cum$ 30,210

11

WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
9.0	30	4	4	2/7	8.2	1	-	9.0	.2/.5	-	100	1.5K	10.0	5.4	Tr	100	-	-

12 Mud Matl's Used: 6 NITRATE,14 POLYSAL,3 SODA ASH,1 CAUSTIC,3 NH4 NITRATE

13

WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
Used	Bal	Used	Bal	Used	Bal	Used	Bal
			432		400	4300	18700

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; JVP 1;HALL 1;EAST 1 Total 23

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	3.0	DRILLED TO 3064M
0300	1.0	CIRCULATED & RAN SURVEY
0400	20.0	DRILLED TO 3182M

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	23.0	301.0
3. Reaming		30.5
4. Coring		27.5
5. Circ.& Cond.		30.5
6. Trips		86.5
7. Repair Rig		31.0
8. Rig Maint.		5.0
9. Dev.Survey	1.0	15.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC		1.5
15.DST		19.0
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		24.0
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	674.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: T. E. OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 33/29 Report No. 30 Date 7/4/89

2 Total Depth 3230.7m Progress 48.7m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity MAKE UP TEST TOOLS FOR DST NO.2

4 Dev/Depth 5 °@ 3169m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

6

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
RR4	REED	HP51A	8 1/2"	BT4862	0 10.13	3230.7	225.7	37	6.1	2.3.I

7

Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
RR4	40	75	8 1/2"	6	100	300	2350	141	466	410	309	75	-	5.44

8

9 BHA Description: TEST STRING FOR STRADDLE TEST (DUAL PACKERS) 3182-3198M (341.5HRS ON JARS)

10 WELL COSTS: Daily$ 17,203 Cum$ 1,203,468 MUD: Daily$ 639 Cum$ 30,849

11

WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
9.1	32	5	5	2/8	7.4	1	-	9.0	.2/.4	-	120	1.5K	12.0	6.1	Tr	150	-	-

12 Mud Matl's Used: 18 BARITE, 9 POLYSAL, 1 PAC,1 CAUSTIC, 3 NH4 NITRATE - 5 MAGCOGEL (PREVIOUSLY CHARGED TO MUD) 1 CALCIUM CHLORIDE- AS TRACER FOR WATER CUSHION

13

WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
Used	Bal	Used	Bal	Used	Bal	Used	Bal
		18	414		400	4200	14500

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; JVP 1;HALL 1;EAST 1 Total 23

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	1.0	DRILLED TO 3188M
0100	0.5	CIRCULATED & RAN SURVEY
0130	0.5	DRILLED TO 3193M
0200	1.5	CIRCULATED SAMPLE
0330	7.0	DRILLED TO 3230.7M
1030	1.5	CIRCULATED BOTTOMS UP
1200	4.0	MADE WIPER TRIP TO SHOE
1600	2.5	WASHED 2.5M FILL. PUMPED HV PILL
1830	2.0	SLUG PIPE. DROP SURVEY.POH TO SHOE
2030	0.5	SLIPPED DRILLING LINE
2100	2.5	FINISHED POH
2330	0.5	PICK UP TEST TOOLS

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	8.5	309.5
3. Reaming		30.5
4. Coring		27.5
5. Circ.& Cond.	6.0	36.5
6. Trips	8.5	95.0
7. Repair Rig		31.0
8. Rig Maint.	0.5	5.0
9. Dev.Survey		15.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC		1.5
15.DST	0.5	19.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		24.0
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	698.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J E OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 34/30 Report No. 31 Date 8/4/89

2 Total Depth 3230.7m Progress NIL Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity RIH WITH TEST TOOLS FOR DST #2A

4 Dev/Depth °@ m; ° @ m; – ° @ m. LAST BOP TEST 5/4/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
6	–	–	–	–	–	–	–	–	–	–	–

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
8															

9 BHA Description: DST #2A TEST STRING (CONVENTIONAL TEST/3 PACKERS)

10 WELL COSTS: Daily$ 22,973 Cum$ 1,226,441 MUD: Daily$ Cum$ 30,849

11	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
HOLE	9.1	32	5	5	2/8	7.4	1	–	9.0	.2/.4	–	120	1.5K	12.0	6.1	Tr	150	–	–
PITS	9.0	30	5	4	2/5	7.7	1	–	9.0	.1/.4		140	1.5K	12.0	5.4	Tr	150		

12 Mud Matl's Used: 1 sx CALCIUM CHLORIDE AS TRACER IN WATER CUSHION

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				414		400	2400	12100

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; JVP 1;HALL 1;EAST 1;DITR 1 Total 23

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	2.5	MADE UP TEST TOOLS FOR DST #2. CONVENTIONAL STRADDLE/DUAL PACKERS. 3182M-3198M
0230	2.0	RIH WITH TOOLS, BHA & 39 STANDS DP
0430	1.0	RAN WATER CUSHION (1315M ABOVE HYDROSPRING)
0530	2.5	FINISHED RIH
0800	1.0	HEADED UP. SET PACKERS. OPENED TOOL. LOST PACKER SEAT.
0900	5.5	POH
1430	1.0	LAID DOWN TEST TOOLS
2100	2.5	FINISHED POH
1530	6.0	LAID DOWN 21 JTS E PIPE.SLIPPED & CUT DRILL LINE. BROKE IN NEW G PIPE. (FILLING IN TIME FOR DAYLIGHT DST 2A).
2130	2.0	MADE UP TEST TOOLS FOR DST #2A. CONVENTIONAL TEST WITH 3 PACKERS. 3174-3230.7(TD).
2330	0.5	RIH

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling		309.5
3. Reaming		30.5
4. Coring		27.5
5. Circ.& Cond.		36.5
6. Trips		95.0
7. Repair Rig		31.0
8. Rig Maint.		5.5
9. Dev.Survey		15.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC		1.5
15.DST	24.0	43.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		24.0
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	722.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J. E. OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 35/31 Report No. 32 Date 9/4/89

2 Total Depth 3230.7m Progress NIL Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity WASHING TO BOTTOM WITH BIT #11

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
11	REED	HP51A	8 1/2"	BT7166	0 10 13	-	-	-	-	-

6

7

Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

8

9 BHA Description: BIT-NB REAMER -MONEL-STAB- 2 X 6 1/2" DC'S-DAILY DRILLING JARS 1 X 6 1/2" DC- 6 HWDP-221 E Grade DP - REST G (341.5 HRS ON JARS)

10 WELL COSTS: Daily$ 22,663 Cum$ 1,249,104 MUD: Daily$ 278 Cum$ 31,128

11

WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
9.0	32	6	7	3/9	8.3	1	-	9.0	.1/.3	-	180	1.5K	15.0	5.4	Tr	250	-	-

Mud Matl's Used: 2 NH4 NITRATE, 5 POLYSAL, 1 CAUSTIC

13

WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
Used	Bal	Used	Bal	Used	Bal	Used	Bal
			414		400	2430	9670

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; JVP 1;HALL 1;EAST 1;DITR 1 Total 24

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	1.0	RIH WITH TOOLS, BHA & 39 STANDS DP.
0100	1.0	RAN WATER CUSHION (1306M ABOVE HYDROSPRING)
0200	4.5	RIH. PICKED UP 21JTS G PIPE. HEADED UP.
0630	4.5	RAN DST 2A (3174-3230.7M, 3 PACKER CONVENTIONAL TEST) OPEN AT 0651HRS (6MIN.PREFLOW) CLOSED AT 0657HRS (30MIN.SHUTIN) REOPEN AT 0727HRS (71MIN.FLOW) CLOSED AT 0838HRS (142MIN.SHUTIN) BUBBLE IN BUCKET FOR FIRST 1-2 SECONDS OF PREFLOW. DEAD THROUGHOUT REMAINDER OF TEST.
1100	5.0	POH.(FOUND TOP OF FLUID AT 1211M ABOVE HYDROSPRING-EXPECT WATER CUSHION AERATED WHEN RUN.RECOVERED WATER CUSHION-SL GAS CUT WITH TRACE OIL.SAMPLE CHAMBER CONTAINED OIL CUT MUD.)
1600	2.0	LAID DOWN TEST TOOLS
1800	3.0	RIH
2100	0.5	SLIPPED DRILLING LINE
2130	1.5	FINISHED RIH
2300	1.0	WASHED 17M TO BOTTOM

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling		309.5
3. Reaming		30.5
4. Coring		27.5
5. Circ.& Cond.	1.0	37.5
6. Trips	4.5	99.0
7. Repair Rig		31.0
8. Rig Maint.	0.5	6.0
9. Dev.Survey		15.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC		1.5
15.DST	18.0	61.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		24.0
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	746.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 36/32 Report No. 33 Date 10/4/89

2 Total Depth 3341 m Progress 110.3m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity RUNNING SURVEY

4 Dev/Depth 6 °@ 3342m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
6	11	REED	HP51A	8 1/2"	BT7166	0 10 13	-	110.3	22.5	4.9	-

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	11	40	70	8 1/2"	6	95	285	2250	134	442	373	268	72	450	4.71
8		43							252						

9 BHA Description: BIT-NB REAMER -MONEL-STAB- 2 X 6 1/2" DC'S-DAILY DRILLING JARS 1 X 6 1/2" DC- 6 HWDP-221 E Grade DP - REST G (364.5 HRS ON JARS)

10 WELL COSTS: Daily$ 15,869 Cum$ 1,264,973 MUD: Daily$ 621 Cum$ 31,749

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.2	34	6	6	3/10	7.5	1	-	9.0	-	-	100	1.4K	15.0	6.5	Tr	300	-	-

Mud Matl's Used: 1 SODA ASH, 12 POLYSAL, 3 CAUSTIC

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				414		400		21600

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; JVP 1;HALL 1; Total 22

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	1.0	DRILLED TO 3236M
0100	0.5	REAMED & WORKED PIPE DUE TO HIGH
0130	21.5	DRILLED TO 3341M
2300	1.0	CIRCULATED & RAN SURVEY

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	22.5	332.0
3. Reaming		30.5
4. Coring		27.5
5. Circ.& Cond.		37.5
6. Trips		99.0
7. Repair Rig		31.0
8. Rig Maint.		6.0
9. Dev.Survey	1.0	16.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC		1.5
15.DST		61.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
2 5.D/H Trouble	0.5	24.5
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	770.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 37/33 Report No. 34 Date 11/4/89

2 Total Depth 3438 m Progress 97m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity DRILLING 8 1/2" HOLE

4 Dev/Depth 6 °@ 3324m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
	11	REED	HP51A	8 1/2"	BT7166	0 10 13	-	207.3	46.0	4.5	-
6											

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	11	43	70	8 1/2"	6	95	285	2275	134	442	377	268	71	450	4.71
8		43							232						

9 BHA Description: BIT-NB REAMER -MONEL-STAB- 2 X 6 1/2" DC'S-DAILY DRILLING JARS 1 X 6 1/2" DC- 6 HWDP-221 E Grade DP - REST G (388 HRS ON JARS)

10 WELL COSTS: Daily$ 16,901 Cum$ 1,281,874 MUD: Daily$ 883 Cum$ 32,632

11	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
	9.2	34	6	7	3/10	8.2	1	-	9.0	.1/.4	.5	80	1.5K	14.0	6.9	Tr	300	-	-

Mud Matl's Used: 10 POLYSAL, 3 CAUSTIC, 4 PAC

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				414		400	4200	17400

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; JVP 1;HALL 1; Total 22

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	6.0	DRILLED TO 3368M
0600	0.5	REAMED & WORKED PIPE DUE TO HIGH TORQUE
0630	17.5	DRILLED TO 3438M

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	23.5	355.5
3. Reaming		30.5
4. Coring		27.5
5. Circ.& Cond.		37.5
6. Trips		99.0
7. Repair Rig		31.0
8. Rig Maint.		6.0
9. Dev.Survey		16.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC		1.5
15.DST		61.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
2 5.D/H Trouble	0.5	25.0
26.Surf.Trouble		1.5
27.CUM TOTAL	24.0	794.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 38/34 Report No. 35 Date 12/4/89

2 Total Depth 3514 m Progress 76m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity DRILLING 8 1/2" HOLE

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
11	REED	HP51A	8 1/2"	BT7166	0 10 13	-	283.3	69.0	4.1	-

6

7

Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
11	43	70	8 1/2"	6	95	285	2275	134	442	377	270	72	425	4.77

8

9 BHA Description: BIT-NB REAMER -MONEL-STAB- 2 X 6 1/2" DC'S-STAB-19 x 6 1/2" DC's DAILY DRILLING JARS-1 X 6 1/2" DC- 6 HWDP-221 E Grade DP - REST G (411 HRS ON JARS)

10 WELL COSTS: Daily$ 15,837 Cum$ 1,297,711 MUD: Daily$ 973 Cum$ 33,605

11

WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
9.3	35	8	7	4/14	8.8	1	-	9.0	.2/.6	-	100	1.4K	16.0	7.6	Tr	300	-	-

Mud Matl's Used: 5 POLYSAL, 4 CAUSTIC, 7 PAC

13

WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
Used	Bal	Used	Bal	Used	Bal	Used	Bal
			414		400	4700	12700

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; JVP 1; Total 21

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	16.5	DRILLED TO 3494M
1630	1.0	ATTEMPTED TO RUN SURVEY - FOUND INSUFFICIENT WIRELINE ON DRUM
1730	6.5	DRILLED TO 3514M

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	23.0	378.5
3. Reaming		30.5
4. Coring		27.5
5. Circ.& Cond.		37.5
6. Trips		99.5
7. Repair Rig		31.0
8. Rig Maint.		6.0
9. Dev.Survey		16.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC		1.5
15.DST		61.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		25.0
26.Surf.Trouble	1.0	2.5
27.CUM TOTAL	24.0	818.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 39/35 Report No. 36 Date 13/4/89

2 Total Depth 3595 m Progress 81m Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity DRILLING 8 1/2" HOLE

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
	11	REED	HP51A	8 1/2"	BT7166	0 10 13	3595	364.0	93.0	3.9	-
6											

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	11	43	70	8 1/2"	6	96	288	2300	136	447	386	279	72	450	4.92
8									235						

9 BHA Description: BIT-NB REAMER -MONEL-STAB- 2 X 6 1/2" DC'S-STAB-19 x 6 1/2" DC's DAILY DRILLING JARS-1 X 6 1/2" DC- 6 HWDP-221 E Grade DP - REST G (435 HRS ON JARS)

10 WELL COSTS: Daily$ 16,414 Cum$ 1,314,125 MUD: Daily$ 1550 Cum$ 35,154

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.3	37	9	8	5/16	7.5	1	-	9.5	.2/.8	-	100	1.4K	17.5	7.6	Tr	300	-	-

Mud Matl's Used: 10 POLYSAL, 7 CAUSTIC, 10 PAC

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				414		400	4955	7745

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; JVP 1;GEARHART 4 Total 25

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	24.0	DRILLED 8 1/2" HOLE TO 3595M,TD. (BIT TORQUED UP, 1ST INDICATION OF FAILURE)

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling	24.0	402.5
3. Reaming		30.5
4. Coring		27.5
5. Circ.& Cond.		37.5
6. Trips		99.5
7. Repair Rig		31.0
8. Rig Maint.		6.0
9. Dev.Survey		16.0
10.Log & Perf		13.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC		1.5
15.DST		61.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		25.0
26.Surf.Trouble		2.5
27.CUM TOTAL	24.0	842.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 40/36 Report No. 37 Date 14/4/89

2 Total Depth 3595 m Progress - Last csg 9 5/8" @ 1867m. Logged to 1860 m

3 Current Activity LOGGING. RUNNING IN WITH DENSITY NEUTRON TOOL (RUN 3)

4 Dev/Depth MR °@ TD m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
11	REED	HP51A	8 1/2"	BT7166	0 10 13	3595	364.0	93.0	3.9	8.8.

6 LOST CONE

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	11	43	70	8 1/2"	6	96	288	2300	136	447	386	279	72	450	4.92
8									235						

9 BHA Description:

10 WELL COSTS: Daily$ 51,397 Cum$ 1,365,522 MUD: Daily$ 173 Cum$ 35,327

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.3	38	10	8	4/16	7.5	1	-	9.5	.2/.8	-	100	1.4K	17.5	7.6	Tr	300	-	-

Mud Matl's Used: 18 BARITE (3SX LIME USED IN SEWERAGE PITS)

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				396		400	-	10370

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; JVP 1;GEARHART 4 Total 25

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	3.0	PUMPED HI VIS PILL.CIRCULATED CLEAN.
0300	0.5	DROPPED SURVEY. SLUGGED PIPE.
0330	5.5	POH. STRAPPED OUT. LAID DOWN MONEL. (STRAP 1.35M SHORTER-NO CORRECTION. BIT HAD LOST ONE CONE.)
0900	15.0	RIGGED UP GEARHART RAN DLL/MSFL (LOGGERS DEPTH 3596M) RAN BCS/MEL (LOGGED FROM 3565M HUD) RUN IN WITH DENSITY NEUTRON TOOL

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling		402.5
3. Reaming		30.5
4. Coring		27.5
5. Circ.& Cond.	3.0	40.5
6. Trips	5.5	105.0
7. Repair Rig		31.0
8. Rig Maint.		6.0
9. Dev.Survey	0.5	16.5
10.Log & Perf	15.0	28.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC		1.5
15.DST		61.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		25.0
26.Surf.Trouble		2.5
27.CUM TOTAL	24.0	866.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 41/37 Report No. 38 Date 15/4/89

2 Total Depth 3595 m Progress - Last csg 9 5/8" @ 1867m. Logged to 3595m m

3 Current Activity POH TO LOG.

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
RR4	REED	HP51A	8 1/2"	BT4862	13 13 13	3595	-	10.0 REAMING	-	4.4.1

6

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	RR4	10	70	8 1/2"	6	95	285	1200	134	235	199	76	38	450	1.34
8			85						232						

9 BHA Description: BIT-BIT SUB-2 DC'S-STAB-19 DC'S-DAILY DRILLING JAR- 1 DC-6 HWDP

10 WELL COSTS: Daily$ 15,737 Cum$ 1,381,259 MUD: Daily$ 571 Cum$ 35,898

11	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
	9.4	34	9	7	3/13	7.8	1	-	9.0	.2/.5	-	120	1.4K	17.5	8.0	Tr	300	-	-

Mud Matl's Used: 18 BARITE, 1 CAUSTIC, 6 POLYSAL, 6 MAGCOGEL

13

WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
Used	Bal	Used	Bal	Used	Bal	Used	Bal
			378		400	1420	8950

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; JVP 1;GEARHART 5;VELDATA 1 Total 27

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	4.0	RAN IN WITH DENSITY NEUTRON TOOL. ATTEMPTED TO WORK PAST LEDGE AT 3005M WITHOUT SUCCESS. RIGGED DOWN GEARHART.
0400	3.5	RIH TO SHOE.(REPLACED 4 JTS E PIPE WITH WASHED CONNECTIONS.)
0730	1.0	SLIPPED & CUT DRILLING LINE
0830	1.5	RIH TO 2987M
1000	1.5	REAMED 2987M-3041M
1130	0.5	RIH TO 3162M
1200	5.5	REAMED 3162M-3243M
1730	0.5	RIH TO 3545M
1800	3.0	REAMED 3545M-3595M
2100	2.0	PUMPED HI VIS PILL & CIRCULATED CLEAN
2300	1.0	SLUGGED PIPE & POH

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling		402.5
3. Reaming	10.0	40.5
4. Coring		27.5
5. Circ.& Cond.	2.0	42.5
6. Trips	7.0	112.0
7. Repair Rig		31.0
8. Rig Maint.	1.0	7.0
9. Dev.Survey		16.5
10.Log & Perf	4.0	32.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC		1.5
15.DST		61.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		25.0
26.Surf.Trouble		2.5
27.CUM TOTAL	24.0	890.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 42/38 Report No. 39 Date 16/4/89

2 Total Depth 3595 m Progress - Last csg 9 5/8" @ 1867m. Logged to 3595 m

3 Current Activity REAMING/CONDITIONING TRIP FOR LOGS

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
6	RR6	REED	HP43A	8 1/2"	P82514	12 13 13	-	-	2.0 REAMING	-	

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	RR6	5	65	8 1/2"	6	116	347	1700	164	302	344	155	45	400	2.73
8		15	90						284						

9 BHA Description: BIT-BIT SUB-2 DC'S-STAB-19 DC'S-DAILY DRILLING JAR- 1 DC-6 HWDP

10 WELL COSTS: Daily$ 21,838 Cum$ 1,403,097 MUD: Daily$ 93 Cum$ 35,991

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.4	33	7	6	3/9	10.2	1	-	9.0	.1/.5	-	120	1.4K	20.0	8.4	Tr	300	-	-

Mud Matl's Used: 5 MAGCOGEL (PREVIOUSLY USED IN HV PILL)

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				378		400	1990	6960

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; JVP 1;GEARHART 5;VELDATA 1 Total 27

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	3.5	POH.
0330	14.0	RIGGED UP GEARHART. RAN DENSITY NEUTRON (LD 3595M) ATTEMPTED TO RUN DIPMETER (HUD 3184M)/ATTEMPTED TO RUN VELOCITY (HUD 3184M) RIGGED DOWN GEARHART
1730	2.5	MADE UP BIT. RIH TO SHOE.
2000	0.5	SLIPPED & CUT DRILLING LINE
2030	1.5	RIH TO 3163M (WORKED PIPE AT PREVIOUS HUD LEVEL - 2958 TO 3015M NO PROBLEM)
2200	2.0	REAMED 3163-3185M (CLEAR TO 3180M TAKING WEIGHT & TORQUE HIGH/ ERRATIC FROM 3180M)

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling		402.5
3. Reaming	2.0	42.5
4. Coring		27.5
5. Circ.& Cond		42.5
6. Trips	7.5	119.5
7. Repair Rig		31.0
8. Rig Maint.	0.5	7.5
9. Dev.Survey		16.5
10.Log & Perf	14.0	46.0
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC		1.5
15.DST		61.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		25.0
26.Surf.Trouble		2.5
27.CUM TOTAL	24.0	914.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 43/39 Report No. 40 Date 17/4/89

2 Total Depth 3595 m Progress - Last csg 9 5/8" @ 1867m. Logged to 3595 m

3 Current Activity LOGGING - RUNNING DIPMETER

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

	Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
	RR6	REED	HP43A	8 1/2"	P82514	12 13 13	-	-	7.0	-	
6									REAMING		

	Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
7	RR6	5	65	8 1/2"	6	116	347	1700	164	302	344	155	45	400	2.73
8		15	90						284						

9 BHA Description: BIT-BIT SUB-2 DC'S-STAB-19 DC'S-DAILY DRILLING JAR- 1 DC-6 HWDP

10 WELL COSTS: Daily$ 18,141 Cum$ 1,421,238 MUD: Daily$ 445 Cum$ 36,436

	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
11	9.4	34	8	7	3/11	7.6	1	-	9.0	.2/.6	-	120	1.4K	20.0	8.4	Tr	300	-	-

Mud Matl's Used: 5 POLYSAL, 2 CAUSTIC, 18 BARITE

13	WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
	Used	Bal	Used	Bal	Used	Bal	Used	Bal
				360		400	2574	4386

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1; JVP 1;GEARHART 5;VELDATA 1 Total 27

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	2.0	REAMED 3185M-3205M
0200	1.5	PULLED BACK & REAMED 3163-3205M AGAIN
0330	0.5	LAID DOWN WORK SINGLES & RIH.HELD UP AT 3216M
0400	0.5	REAMED 3216M-3253M
0430	0.5	RIH TO 3546M
0500	1.0	REAMED & WASHED 3546-3595M TD (10M FILL)
0600	2.0	CIRCULATED BOTTOMS UP. SLUGGED PIPE
0800	4.5	POH
1230	11.5	RIGGED UP GEARHART RAN VELOCITY SURVEY (LD 3589M) RAN DIPMETER (HUD 3200M)

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling		402.5
3. Reaming	5.0	47.5
4. Coring		27.5
5. Circ.& Cond	2.0	44.5
6. Trips	5.5	125.0
7. Repair Rig		31.0
8. Rig Maint.		7.5
9. Dev.Survey		16.5
10.Log & Perf	11.5	57.5
11.RU RunCsg,Tub		25.0
12.Cementing		7.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC		1.5
15.DST		61.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		25.0
26.Surf.Trouble		2.5
27.CUM TOTAL	24.0	938.5

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 44/40 Report No. 41 Date 18/4/89

2 Total Depth 3595 m Progress - Last csg 9 5/8" @ 1867m. Logged to 3595 m

3 Current Activity LAYING DOWN PIPE

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
-	-	-	-	-	-	-	-	-	-	

6

Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

7

8

9 BHA Description:

10 WELL COSTS: Daily$ 114,655 Cum$ 1,535,893 MUD: Daily$ 20 Cum$ 36,456

11

WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
9.4	34	8	7	3/11	7.6	1	-	9.0	.2/.6	-	120	1.4K	20.0	8.4	Tr	300	-	-

Mud Matl's Used: STOCK ADJUSTMENT 1 BICARB (USED/NOT RECORDED)
2 SALT (BROKEN SACKS)

13

WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
Used	Bal	Used	Bal	Used	Bal	Used	Bal
			360		240		3400

14 POB: Oper 2 Contr 15 Service GEOD 2;IDFS 1;HALL 2;GEARHART 5; Total 27

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	11.5	GEARHART RAN LOGS CONTINUED DIPMETER (HUD 3200M) RAN ROTARY CORING TOOL (ELECT. MOTOR SEIZED) RAN SIDEWALL CORE GUN (SHOT 24, REC 22) RIGGED DOWN GEARHART
1130	1.0	LAID DOWN CORE BARREL
1230	1.0	LAID DOWN DRILLING JARS, STABS & 4 DC'S
1330	2.0	RIH OEDP TO SHOE
1530	0.5	SLIPPED DRILLING LINE
1600	2.0	LAID DOWN REMAINING DC'S & HWDP
1800	0.5	CIRCULATED
1830	2.0	SET PLUG NO.1 FROM 1902 TO 1817M 167 SX NEAT CLASS G CEMENT 15.8PPG
2030	0.5	PULLED BACK & REVERSE CIRCULATED
2100	0.5	POH 13 STANDS
2130	1.5	LAID DOWN KELLY
2300	1.0	LAID DOWN DP

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling		402.5
3. Reaming		47.5
4. Coring		27.5
5. Circ.& Cond	1.0	45.5
6. Trips	2.5	127.5
7. Repair Rig		31.0
8. Rig Maint.	0.5	8.0
9. Dev.Survey		16.5
10.Log & Perf	11.5	69.0
11.RU RunCsg,Tub		25.0
12.Cementing	2.0	9.0
13.NU,Test BOPCsg		36.0
14.PU/LD,DP/DC	6.5	8.0
15.DST		61.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		25.0
26.Surf.Trouble		2.5
27.CUM TOTAL	24.0	962.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J E OZOLINS

MINORA RESOURCES NL.

DAILY DRILLING REPORT (ONSHORE)

1 Well WINDERMERE NO.2 DOL/DSS 45/41 Report No. 42 Date 19/4/89

2 Total Depth 3595 m Progress - Last csg 9 5/8" @ 1867m. Logged to 3595 m

3 Current Activity PLUGGED & ABANDONED - RIG RELEASED

4 Dev/Depth °@ m; ° @ m; - ° @ m. LAST BOP TEST 5/4/89

Bit	Make	Type	Size	S/No	Noz	M/Out	Metres	Hrs	M/Hr	T.B.G.
–	–	–	–	–	–	–	–	–	–	

6

Bit	WOB	RPM	STK	LNR	SPM	GPM	PSI	AV	NV	SHP	BHP	%HP	Tor	HP/in
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

7
8

9 BHA Description:

10 WELL COSTS: Daily$ 131,107 Cum$ 1,667,000 MUD: Daily$ Cum$ 36,456

11	WT	VIS	PV	YP	Gels	WL	FC	HT/HP	Ph	Pf/Mf	Pm	Ca	Cl	MBT	SC	Sand	NO3	KCL	NaCl
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Mud Matl's Used:

13

WATER (bbls)		BARITE (100lb)		CEMENT (94lb)		FUEL (litres)	
Used	Bal	Used	Bal	Used	Bal	Used	Bal
			360	35	198		

14 POB: Oper 1 Contr 15 Service HALLIB 2 Total 18

FROM	HRS	DETAILS OF PAST 24 HOURS OPERATIONS
0000	2.5	LAID DOWN PIPE
0230	0.5	PRESSURE TESTED PLUG NO 1 WITH 2500 PSI. OK.
0300	7.5	LAID DOWN PIPE
1030	1.0	SET PLUG NO.2 FROM 60M TO 30M 35 SX NEAT CLASS G 15.8PPG
1130	0.5	FINISHED LAYING DOWN PIPE. FLUSHED BOP'S & SURFACE LINES WITH WATER
1200	3.0	NIPPLED DOWN BOP'S. CLEANED MUD TANKS.
1500	0.5	REMOVED CASING SPOOL.
1530	1.0	CUT 9 5/8" CASING. REMOVED BRADENHEAD
1630	0.5	LAID DOWN SWIVEL/KELLY ASSEMBLY INSTALLED CAP.

RELEASED RIG AT 1700 HOURS
19/4/89

OPERATION	DAY	CUM
1. Rig Up/Down		3.5
2. Drilling		402.5
3. Reaming		47.5
4. Coring		27.5
5. Circ.& Cond		45.5
6. Trips		127.5
7. Repair Rig		31.0
8. Rig Maint.		8.0
9. Dev.Survey		16.5
10.Log & Perf		69.0
11.RU RunCsg,Tub		25.0
12.Cementing	1.5	10.5
13.NU,Test BOPCsg	5.0	41.0
14.PU/LD,DP/DC	10.5	18.5
15.DST		61.5
16.Loss Circ		
17.Remed.Cmt'g		
18.Fishing		
19.Control Press		
20.WOO/Tools,etc		4.5
21.WOW/WOC		9.5
22.Completion		
23.P & A		
24.FIT		3.0
25.D/H Trouble		25.0
26.Surf.Trouble		2.5
27.CUM TOTAL	17.0	979.5

RIG NAME: ATCO A2 DRILLING SUPERVISOR: J E OZOLINS

APPENDIX B

APPENDIX B

DRILLING FLUID SUMMARY

DRILLING FLUID SUMMARY

WELL : WINDERMERE # 2

OTWAY BASIN

VICTORIA

Prepared by : Andre Skujins
Date : April 1989

I.D.F.S.

CONTENTS

WELL : WINDERMERE # 2
RIG : ATCO APM # A2
SPUD : 9th MARCH 1989

1. SUMMARY OF OPERATIONS

HOLE SIZE : 17 1/2"
MUD TYPE : WATER-HIGH VISCOSITY SWEEPS / KCl NATIVE CLAYS
INTERVAL : 0 - 341 Metres
CASING SIZE : 13 3/8"

Windermere # 2 was spudded in on the 9th March 1989 utilizing ATCO APM # A2, and reached a total depth of 3595 metres on the 13th April 1989.

The 17 1/2 " surface hole was initially drilled with a 40 viscosity spud mud with a low active volume. Water was then added and high viscosity sweeps (comprising Kwik Thik, Caustic Soda and Lime) were used to ensure that the hole was being cleaned. Downhole losses of up to 40 bbls per connection were noted while drilling the Port Campbell Limestone.

When the Gellibrand Marl was intersected, the drilling fluid was allowed to mud up naturally due to the mud making character of the formation. The viscosity was kept relatively low due to the possibility of mud rings forming. High viscosity mud was occasionally pumped to verify hole cleaning. 280 bbls of 8% w/v KCl brine was added to the mud to further reduce the chance of mud ring formation and resulted in a 2% KCl system.

The solids control equipment was run continuously throughout this interval of hole to maintain a reasonable mud weight and to minimize a build up of fine solids in the mud system.

Drilling continued to a depth of 341 metres. The 13 3/8" casing was run to 314 metres and cemented. The cement was displaced with mud. Although 140 barrels of cement returns came to surface, a top up job was required after the annulus dropped while waiting on cement.

HOLE SIZE : 12 1/4"
MUD TYPE : NaCl POLYMER - KCl POLYMER
INTERVAL : 341 - 1869 Metres
CASING SIZE : 9 5/8"

While nippling up the blow out preventers, the sand trap and shaker tank were dumped and cleaned. Approximately 380 bbls of mud from the previous hole section was kept. The shale shaker screens were changed from B40/B60 to B80/B100.

A 12 1/4" bit was run in the hole and the cement, float and shoe were drilled out using the mud from the previous section of hole. Any cement contamination was treated out with Soda Ash. The hole was drilled to 344 metres where a leak off test was conducted. An equivalent mud weight of 19.0 ppg was achieved.

Drilling then continued using the mud from the previous section of hole. All solids control equipment was utilized (including the centrifuge) to maintain the lowest possible mud weight. Sodium chloride was added to provide inhibition (instead of potassium chloride due to cost considerations) and a chlorides concentration of between 20,000 to 34,000 mg/lt was maintained.

Due to the relatively high mud weight resulting from both a solids build up and the high chlorides (25,000 mg/lt chlorides increases the mud weight 0.2 ppg), large volumes of mud were dumped to allow heavy dilution. After consideration of the effects of large volumes of salty fluid on the farmer's property, the salt additions were substituted with potassium chloride for its usefulness as a fertilizer.

Drilling continued and at 898 metres a wiper trip to the shoe was conducted. The hole was found to be sticky in parts. The bit was then tripped at 1197 metres. The hole was tight and the kelly was picked up to work the hole from 905 to 885 metres. The pipe was then pulled through tight hole from 885 to 800 metres. No problems were encountered running back in the hole.

During this interval of hole, the mud properties were slowly refined. The fluid loss was lowered, although heavy dilution initially proved a problem. It was eventually lowered to approximately 8 - 10 mls/30 minutes by 800 metres and maintained at that level until 1400 metres. Polysal and Pac were used to lower the fluid loss, with the PAC also increasing the viscosity and yield point.

The mud weight gradually increased to approximately 9.5 ppg due to a build up of dispersive clays from the Eumeralla Formation. This was evidenced by the fact that the MBT increased by 7.5 lb/bbl despite water dilution. The viscosity was maintained at between 41 to 45 sec/qt, with good PV:YP ratios ensuring good hole cleaning and laminar flow. The gel strengths were maintained at reasonable levels with the 10 minute gel strength below 20. A KCl concentration of 1.5% to 3% w/v was maintained to ensure good hole stability.

At 1400 metres the fluid loss was allowed to increase naturally due to cost considerations. The mud weight was also diluted back from

9.5 ppg to 9.35 ppg. The fluid loss was then lowered to approximately 6.5 mls prior to entering the Heathfield Member at 1722 metres.

The bit was tripped at 1743 metres and tight hole was reamed at 1561 metres. The trip continued and the hole was tight from 1561 to 1017 metres. When out of the hole a core barrel was made up and run in. After washing and reaming from 1700 to 1743 metres, Core # 1 was cut to 1748 metres, with a 78% recovery.

An 8 1/2" bit was then run back in the hole and drilling continued to 1771 metres where Core # 2 was cut. No problems were encountered during the trips. Core # 2 was cut to 1793 metres and a 99.4 % recovery was made. Drilling then continued to 1803 metres where DST # 1 was conducted. Again no hole problems were experienced.

Throughout this period the solids control equipment was run almost continuously and also while tripping.

After DST # 1 was completed, drilling resumed and the 8 1/2" hole was deepened to 1869 metres. Bottoms up was circulated and a KCl heavy weight slug was pumped prior to pulling out of the hole. The electric logs were then run and no problems were experienced with the hole.

When the logs had been completed, a Pressure Integrity Test was conducted with a view to continue the hole to Total Depth. Poor results led to a decision to run 9 5/8" casing. A 12 1/4" bit was then made up and run in the hole. The hole had to be washed and reamed from 1063 to 1086 metres, 1140 to 1172 metres, 1245 to 1254 metres and 1731 to 1744 metres. The 8 1/2" hole was then opened with the 12 1/4" bit from 1744 to 1869 metres. Bottoms up was circulated and the bit was tripped out of the hole.

The 9 5/8" casing was then run in the hole and after the hole was circulated clean, the casing was cemented. Prior to cementing, the sand trap and shaker tank were dumped and cleaned, and the mud from suction tank # 1 was transferred to them. The suction tank was then used to mix up Wyoming bentonite in fresh water for use in the cement job. The cement was displaced with mud. It was at this stage of the hole that the I.D.F.S. Drilling Fluid Engineer arrived on location.

HOLE SIZE : 8 1/2"
INTERVAL : 1869 m - 3595 m
MUD TYPE : KCl POLYMER - WATER - F.W. POLYMER
CASING : P&A

While nippling up the blow out preventers, the centrifuge was run to reduce the mud weight in the pits as much as possible. The shaker and desander tanks were dumped due to cement contamination. The shale shaker screens were changed to B80/S100 and B40/B120. After the surface equipment had been pressure tested, an 8 1/2" bit was run in the hole. Cement was tagged at 1037 metres and the cement, plug and stage collar were drilled out. Simultaneously, the mud was treated with bicarb soda to treat out any cement contamination. Bicarb was used in preference to soda ash due to its lower pH.

The pipe was then run further in the hole. The blow out preventers were then further pressure tested but due to a failure, the pipe was pulled from the hole. The problem was rectified and the bit was run back in the hole. The cement and shoe were then drilled out and a further 3 metres of open hole was drilled. A Pressure Integrity Test was then conducted with a leak off at an equivalent mud weight of 12.65 ppg.

Drilling then continued with the existing KCl polymer mud from the previous hole section. All solids control equipment was run continuously. Sodium sulphite was added at a concentrtation of approximately 100 mg/lt for corosion control. Sodium nitrate was added to maintain a concentration of 150 to 200 mg/lt for use as a tracer. No other chemicals were added since all the other mud properties were adequate for this section of hole. The fluid loss was allowed to increase naturally since the formation being drilled was not very porous and relatively inert.

Due to the high pH of the mud resulting from drilling out the cement, the polymers responsible for the viscosity and yield point were adversely affected to some degree. The viscosity dropped to 32 to 33 sec/qt and the yield point to 3 to 5 lb/100ft^2. Although the annular flow properties were in turbulent flow, hole cleaning was not adversely affected.

No water or fresh mud was being added and the mud weight began to rise slowly. Due to the slow rate of penetration caused somewhat by the mud weight, it was decided that the hole should be displaced with water. This was commenced at 2079 metres and as much mud as possible from the hole was stored in the mud tanks. When the tanks were full, approximately 200 barrels of mud had to be dumped. The water was pumped from the sump via the mud mixing hopper into the pill tank and all fluid returns were diverted to the sump where solids had time to settle out. The penetration rate doubled and no hole problems were experienced while making connections. No hole cleaning problems were experienced.

The water being circulated through the sump had a chlorides level of approximately 9000 mg/lt and a KCl concentration of approximately 0.8% w/v. The nitrate level was approximately 100 mg/lt.

Drilling continued to 2261 metres where the bit was tripped. No hole problems were experienced. A PDC bit was then run in the hole and 4 metres of fill were found. Drilling continued and no problems were noticed keeping the water relatively clean. The PDC bit was tripped out due to a disappointing rate of penetration.

Drilling continued and at approximately 2400 metres the water system was "closed" in. The water was circulated from the shale shakers down the trough into the pill tank and skimmed into the suction tank. Therefore the suction tank, which was monitored for pit level changes, was the only active tank with variable volume. Consequently any gain or loss could be quantified to aid in possible kick detection.

The weight of the water slowly increased due to the limited settling area in use. Consequently, the fluid was dumped and completely displaced with water from the sump from time to time. A noticable increase in the rate of penetration occured each time the hole was displaced.

At 2403 metres the pipe was pulled wet for a suspected washout. No tight hole was observed. Drilling continued and the bit was tripped at 2603 metres, again with no hole problems.

Drilling resumed and at approximately 2700 metres the hole was displaced with fresh water from the day tank. This was done because the sump water had become irretrievably dirty. It had become impossible to maintain low to no solids in the water. One sack of sodium nitrate was added to the water as a tracer.

At this stage, it was noticed that the mud being stored in the spare mud pits had become diluted back to the stage that it was not economical to use when the hole was again mudded up. i.e. The solids content of the mud was still too high to justify its future use. It was therefore dumped and the tanks were completely cleaned out and filled with fresh water.

At 2775 and 2882 metres the hole was very tight on connections. Pump # 1 was being repaired at the time and Pump # 2 was in use. (Pump # 2 does not have the same output as Pump # 1. i.e. Lower annular velocities were not adequate for hole cleaning.) A high viscosity pill (approximately 35 barrels of stored mud and 2 sacks of PAC) was pumped after the first tight connection and seemed to alleviate the problem. Each time Pump # 1 was put back on line, subsequent connections experienced no problems.

At 2833 metres mudding up commenced. The tanks that had been in use with the water drilling were dumped and cleaned. The entire "water" drilling system was dumped at the shale shakers as the weight had increased to 8.9 ppg and the hole was displaced with fresh water. The shale shaker screens were changed to B100/S100. Although the screens had to be scrubbed occasionally to reduce blinding, no mud losses occured.

Chemicals were then added to the water to achieve the desired mud specifications. PAC was added initially to achieve both a lowered fluid loss and to increase the rheological values to ensure reasonable hole cleaning. Approximately 1.5 lb/bbl of PAC was added and the fluid loss was reduced to approximately 11 mls/30 minutes. The viscosity and yield point, however, failed to increase as expected with this concentration of PAC. A viscosity of 31 sec/qt and a yield point of 4 lb/100 ft^2 were achieved. It was decided though that these rheological levels were adequate for hole cleaning, so no further additions of PAC were made. Instead, the fluid loss was further lowered to approximately 8 mls/30 minutes with Polysal.

After the addition of the first 0.8 lb/bbl of PAC, Caustic Soda additions were made to increase the pH to between 9.0 to 9.5. The caustic additions were held off until this stage due to the fact that polymers (e.g. PAC) diperse best at a neutral pH (7.0 - 8.0).

Simultaneous to the additions of the above chemicals were the additions of Sodium Nitrate as a tracer, and Sodium Sulphite as an oxygen scavenger for corrosion control. Although the addition of a given amount of Sodium Nitrate in a given volume of mud should yield fairly accurately a certain expected concentration of nitrate within the filtrate, these results appeared to be much lower than expected. It appeared that when Sodium Sulphite was introduced to the mud system, that the nitrates started to deplete. In fact, for the mud check conducted at 3004 metres, the nitrates had depleted to almost nothing. A pilot test was then conducted with both chemicals and it was found that the addition of Sodium Sulphite to a Sodium Nitrate solution reduced the nitrate concentration to zero mg/lt. It was therefore decided that since the nitrate tracer was more important than the need for an oxygen scavenger in a fresh water mud with adequate pH control, that additions of Sodium Sulphite would stop. Increased amounts of Sodium Nitrate, and then Ammonium Nitrate, were used in an effort to increase the nitrate concentration to approximately 200 mg/lt. However it was only when the sulphite concentration was almost negligible that the nitrate concentration started to increase appreciably.

At 3005 metres the pipe was again pulled for a suspected washout.

The bit was found to be washed and a new bit was run in the hole. Drilling continued and from approximately 3040 metres the increasing amount of coal had a thinning effect on the mud. The viscosity dropped from 30 to 28 sec/qt and the yield point dropped from 2 to 1 lb/100 ft^2. The pH also dropped considerably and required further additions of Caustic Soda.

From approximately 3170 metres to 3231 metres, the mud properties changed dramatically. The viscosity increased from 28 to 32 sec/qt and the yield point increased from 1 to 5 lb/100 ft^2. The mud weight increased at a more rapid rate than expected due to the more dispersive clays being drilled through and this was evidenced by the increase in the MBT value from 6 to 12 lb/bbl equivalent. The fluid loss did not seem to be effected by the increase in fine solids.

Drilling continued to 3231 metres where bottoms up was circulated. A wiper trip to the shoe was conducted and when back on bottom 2 metres of fill was recorded. A high viscosity pill was circulated and showed the hole to be clean. The pipe was then pulled from the hole and DST # 2 was conducted. Due to the packer seat not holding, the test tool was pulled from the hole. DST # 2A was then conducted. The test was a mechanical success. A bottom hole temperature of 275^ F was recorded.

Drilling then resumed and because all the solids control equipment had been running continuously, the mud weight in the pits had dropped from 9.15 to 9.05 ppg. When back on bottom the mud was conditioned with Polysal to ensure that the fluid loss would remain under 8 mls/30 minutes. Caustic Soda was added to keep the pH at 9.0 to 9.5 and more Ammoniun Nitrate was added to ensure the nitrate values would remain at approximately 200 mg/lt. Of interest was the fact that since there was no discernable sulphite left in the mud, only two sacks of Ammonium Nitrate increased the nitrate value to approximately 300 mg/l, and it remained at this level until total depth.

Drilling continued to a total depth of 3595 metres. Chemical usage increased due to the increasing bottom hole temperature as TD was being approached. Polysal was still the most cost effective additive to maintain the fluid loss, but PAC was also being added due to the Polysal stock running low. When no more Polysal was available, PAC was used exclusively to maintain the fluid loss at approximately 8 mls/30 minutes. This proved to be unsuccessful with the fluid loss actually increasing slowly despite the PAC additions.

A new pallet of Polysal arrived on location 4 hours prior to reaching total depth. The fluid loss at this time was 11.5 mls/30 minutes. 10 sacks of Polysal were added and the fluid loss was reduced to 7.5 mls/30 minutes.

Total depth was reached 5 metres earlier than planned when the bit torqued up at 3595 metres. A high viscosity pill was pumped through the hole and the pipe was then pulled.

Electric logs were then run. During the third run the tool hung up at 3005 metres, presumably on a ledge. A bit was run in and the hole was reamed from 2987 to 3041 metres, 3162 to 3243 metres and 50 metres to bottom. A high viscosity pill was circulated through the hole and the mud in the open hole was treated with Caustic Soda and Polysal to lower the fluid loss. The pipe was then pulled.

Logging continued, but on run # 4 the tool hung up on a ledge at 3184 metres. Another conditioning trip was made with the pipe being worked from 2958 to 3015 metres, and reamed from 3163 to 3205 metres. The pipe was then pulled back to 3163 metres and the hole was reamed again to 3205 metres. The pipe was then run to 3546 metres and reamed to bottom. Bottoms up was circulated and the pipe was pulled.

Electric logging continued and the Velocity Shoot was run without problems. However, on the next logging run, the tool again hung up on a ledge. No further wiper trips were conducted though since subsequent runs were completed from this point up.

The hole was subsequently plugged and abandoned.

2. OBSERVATIONS AND RECOMMENDATIONS

Windermere # 2 was drilled to a total depth of 3595 metres for a total mud cost of $36,456.07 or $10.14 per metre. It was generally a trouble free hole although there were problems associated with electric logging.

The I.D.F.S. Drilling Fluid Engineer did not arrive on location until the 9 5/8" had been run and cemented. All information previous to this is based on the previous mud reports and the Operator's reports. Consequently any conclusions or recommendations are also based on these reports.

A detailed analysis by hole section follows.

17 1/2" SURFACE HOLE

This section of hole was drilled for a mud cost of $1929.60 or $5.66 per metre. No problems were experienced during this section of hole.

Of particular interest in the breakdown of mud usage for this interval is the cost of the KCl used. (i.e. $1420.00 or 74% of the mud cost.) The KCl was added as a precaution against mud ring formation in the Gellibrand Marl. The maintenance of a low viscosity mud, (e.g. 30-32 viscosity would more than likely provide a yield point for sufficient hole cleaning) using water dilution as necessary to control viscosity, solids build up and the liklihood of mud rings forming would be the most cost effective. Consideration should only be given to using KCl if the water supply is limited or the sump is too small.

Another modification to the program, and certainly where a "one off well" is being drilled, is to use Wyoming Bentonite (or an equivalent) in conjunction with a clay extender such as Benex. The advantages to this would be two-fold:

i) A Benificiated Bentonite (i.e. Kwik-thik) would not be required. Therefore, if it was not required or used on Surface hole, it would not sit on the lease waiting to be sent back to stores or the next lease.

ii) Bentonite additions could still be made to the active mud system. Where lime is added to the spud mud as a flocculent, future bentonite additions are not as effective due to the Calcium ions present in the mud. Where Benex is used, the order of addition is not important. Since Benex is added in the ratio of one 2 lb bag to every five 100 lb sacks of bentonite, transportation costs are negligible for Benex. Further, any un-used gel for this section of hole can still be used.

While drilling the top part of the surface hole through the Port Campbell Limestone, high viscosity sweeps were used to aid and check on hole cleaning and/or add extra viscosity to the mud. Some mud losses were experienced while drilling the limestone. Since gauge hole is not critical in this section of hole (a top up cement job is still likely if for no other reason that the cement will drop in the limestone), water will be more than adequqte for hole cleaning due to the relatively low specific gravity of the limestone. A viscous spud mud is only required while drilling the 8" collars past the conductor barrel. Therefore we suggest that approximately 150 barrels of viscous spud mud be mixed and used to drill with the 8" collars past the conductor barrel and then be watered back to maintain a minimum mud weight for optimum rates of penetration. Then as the Gellibrand Marl is drilled, a low viscosity mud (due to the native clays drilled) should be maintained. If bit balling, mud ring formation, or tight and sticky hole started to become a problem, a viscosity cup full of SAPP in the drill pipe during connections will drastically reduce any stickiness at a reasonably low cost.

12 1/4" INTERMEDIATE HOLE

This section of hole was drilled for a mud cost of $22,075.25 or $14.45 per metre. No major hole problems occurred apart from minor tight hole on some trips. Often, as probably was the case here, this is just an indication that the hole is close to gauge. Any tight hole encountered was not evident in future trips. Also, none of the tight hole problems occurred in either of the Pember Mudstone, Pebble Point, or Belfast Mudstone formations.

MUDDING UP

The hole was initially drilled with mud from the previous hole interval. Apart from a minimal amount of KCl and some viscosity, this mud had no other positive properties. Because it had an initial mud weight of 9.05 ppg, whereas a minimum mud weight was desirable for drilling this section of hole, it would have been more cost effective to build a new mud. It is therefore recommended that unless the high weight is required, that the spud mud be dumped in future. A fresh mud can be mixed if drilling is to continue with mud. Alternatively, drilling could continue with clear water. We believe this would be desirable in the interests of cost effective drilling due to increased rates of penetration, better bit life, and lowered mud costs. A flocculant would be added under the shale shakers to maintain the clear water system. If sticky hole is envisaged or becomes a problem, KCl could be added. 2% should be sufficient and will in fact aid in maintaining the clear water system. Mudding up could commence prior to any possible targets being drilled.

NACL vs KCL POLYMER FLUIDS

During the initial stages of this interval, NaCl was added to increase the fluids inhibition. This was preferred to KCl due to it being half the price per sack. This is false economics for two reasons. Firstly, since NaCl only provides inhibition through the chloride ion, the chloride concentration has to be significantly higher than if KCl were used. This more than likely results in a higher chemical cost for NaCl than for KCl at the same level of inhibition. Secondly, since probably twice the concentration of NaCl is required for similar inhibition, (and we strongly suspect that more than twice the concentration is required), the resulting increase in mud weight from salt results in either or both decreased rates of penetration and an increase in other chemical usage due to dumping and diluting. We therefore suggest that only KCl be used if inhibition is required.

FLUID LOSS AND POTASSIUM ION PARAMETERS

A minor, but perhaps in the long term an important criticism of the mud program was in the assertion that while drilling certain formations higher in the hole, the fluid loss and KCl concentrations should be more inhibitive, and then relaxed after the formations had been drilled through. For instance, Potassium is added to mud due to its capacity for base exchange with the Sodium ion within swelling clays. This chemical reaction is dependent on both the concentration of Potassium and Sodium within the mud filtrate. It is not an irreversable equation, and if an inhibitive equilibrium is reached with a certain Potassium concentration, then lowering this level will result in some of the Potassium providing the inhibition moving back into the mud. Consequently, these formations may destabilize. Conversely, if these formations do not destabilize, it can be inferred that the original Potassium concentration need not have been as high.

The same theory may be applied to fluid loss control, assuming that the fluid loss control applies to inhibition rather than protection of formations. Since down-hole fluid loss is generally in a dynamic situation, (i.e. the filter cake is continually being eroded and rebuilt by the circulating fluid), relaxing fluid loss parameters after certain formations have been drilled will result in that formation being affected by the higher level of fluid loss.

CORROSION CONTROL

Since this section of hole was drilled with a NaCl, and then a KCl Polymer fluid, we believe that a corrosion program should have been followed. More will be said about this in the 8 1/2" hole recommendations section.

CHEMICAL CONSUMPTION

The chemical consumption for this interval can not be commented on since the I.D.F.S. Engineer was not present and first hand experience is necessary for such comments. However, in hindsight and due to problems experienced with the PAC product in the 8 1/2" hole, it seems that a surprisingly high concentration of PAC was used. Again, further comments will be made in the 8 1/2" hole summary.

HOLE GAUGE

The hole gauge in this section of hole was generally very good. We do not consider it cost effective or a worthwhile exercise to try to improve this aspect of the hole.

8 1/2" PRODUCTION HOLE

This section of hole was drilled for a total mud cost of $12,451.22 or $7.21 per foot. No problems were experienced drilling this section, but there were problems associated with getting the electric logging tools to bottom. These problems were not thought to be mud related.

INITIAL MUD UP

Drilling of this section of hole commenced with the KCl Polymer mud from the previous section of hole. For the same reasons as outlined in the 12 1/4" hole recommendations, we believe it would be more economical to dump this mud completely and start with fresh mud, or preferably use clear water.

When drilling commenced, the mud had a low viscosity (approx 33 sec/qt) and high mud weight (approx 9.2 ppg). The KCl concentration was 2.8%. The total mud volume was 800 barrels. The only positive aspect of this mud was the KCl content, but this only represented the equivalent of approximately 75 sacks of KCl. It would definately have been more cost effective to build a new mud with consequently a lower weight and solids content.

WATER DRILLING

The hole was displaced with water at 2079 metres because the rate of penetration was slow. It appeared that the formation being drilled through (the Lower Eumeralla) was stable, especially since the potassium in the mud was not being depleted. The rate of penetration increased immediately when the hole was displaced with water. The fluid was circulated through the sump for maximum settling and because the mud tanks were storing the KCl Polymer mud. It was anticipated that the mud would be used in deeper in the hole. This mud was however eventually dumped since it got contaminated with water.

Due to the success of the water drilling as evidenced by the rate of penetration increasing proportionally to the lowered weight of the drilling fluid, it is recommended that it commence from drill out on future wells. Mudding up should commence and be completed prior to any primary targets being drilled through.

Since it is anticipated that the mud from the previous hole section has been dumped, the mud tanks can be used as settling tanks. A flocculant (a liquid polyacrylamide is the most cost effective) should be added under the shale shakers to facilitate settling. The sand trap and settling tanks should be dumped as required. Any fluid dumped can be reclaimed after solids have dropped out. The advantage to using the mud pits for settling would be that the fluid levels could be monitored for kick control.

Any particular level of nitrates, chlorides, or potassium can still be maintained. When using a floc-water system, a high hardness level (minimum of 400-500 mg/l) and a pH of approximately 8.5 is desirable for maximum flocculation. This could be achieved with the additions of lime for pH and calcium, and calcium chloride for extra calcium levels. Also, if KCl is to be used, this would also facilitate the flocculation process.

If required, some old (viscous) mud can be stored in the pill tank for future use as high viscosity slugs to aid in or to check on hole cleaning. It appeared on this hole that the only time hole cleaning was a problem was when the pump rate, and consequently the annular velocities, were too low. This occured when the lower capacity duplex pump was in use while the triplex was being repaired.

Perhaps the only disadvantage to using water is that the hole will wash out to a greater degree. However, from the point of view of drilling the hole, this is not seen as a problem. In fact, the larger hole gauge did not seem to pose any problem to electric log interpretation since the hole was generally uniformly over-gauge.

MUDDING UP

Mudding up after the water drilling commenced at 2833 metres. This was achieved by displacing the hole with fresh water and then adding the required chemicals. PAC was used initially to provide both a lowered fluid loss and an increased viscosity. Approximately 1.5 lb/bbl was added was added over a period of 15 hours. The viscosity only increased to 31 sec/qt (and a yield point of 2-3) and the fluid loss was lowered to 11 mls. This seems to be an unacceptable performance for any type of PAC product in a fresh water environment. Consequently, Polysal was used for fluid loss control and performed well. Since hole cleaning was adequate, extra viscosity was not required.

NITRATE TRACERS

Nitrates were used as a tracer on this well. Seemingly, no problems were encountered with their use on the previous hole section. However, when sodium sulphite was introduced as an oxygen scavenger after mudding up during this section of hole, problems in maintaining the required nitrate concentration were noticed. A pilot test was conducted on the effect of sodium sulphite on a given concentration of nitrates within a water solution. It was found that the addition of sulphites resulted in no nitrates being left in solution. Therefore, since a fresh water mud was in use, it was decided that an adequate pH should be maintained for corrosion control.

Therefore it is suggested that if a nitrate tracer is required, that another form of corrosion control be used. Alternatively, a different tracer (e.g. a radioactive isotope) could be used.

CORROSION CONTROL

Corrosion control is in the best interests of both the Operator and the Drilling Contractor. Corrosion due to soluble oxygen is thought to be worst at a concentration of approximately 18,000 mg/lt. This is approximately the level that most KCl muds run at in the Otway Basin. If an oxygen scavenger is not to be used due to nitrates present in the mud, a film forming amine could be used. It can be dosed down the drill pipe and around the pipe in the annulus while tripping.

GENERAL COMMENTS

SUMP SIZE

The size of the sump for this well was too small. This did not give rise to any problems since fluid was pumped out periodically onto the farmer's adjoining paddock. It is not an isolated problem and often fluid, as was done on this well also, is pumped back to make extra mud volume. If water drilling is to be utilized in the future, this procedure is even more important due to the frequent dumping of settling tanks. Since a flocculant would be in use, the sump should be designed to provide a maximum settling effect.

We suggest that the sump be as deep as possible on the side where fluid is reclaimed from. A wall or barrier should remain down the middle and when the rig is on location, a trench can be dug at the far end. An old piece of casing (or similar) should be placed there and fluid can be skimmed off the top. This type of sump design would greatly enhance the retieval of clear fluid with no extra costs involved with sump construction.

3. INTERVAL COSTS

3.1 MUD TYPE : WATER-HI VIS SWEEPS / KCl-NATIVE SOLIDS
HOLE SIZE : 17 1/2"
INTERVAL : 0 m - 341 m

PRODUCT	SIZE	UNIT COST	USED	$COST	%COST
Caustic Soda	25 kg	$28.88	1	$28.88	1.5
KCl	50 kg	$17.75	80	$1,420.00	73.6
Kwik Thik	25 kg	$11.18	40	$447.20	23.2
Lime	25 kg	$8.38	4	$33.52	1.7
			Total =	$1,929.60	100.0

Cost per Metre = $5.66

3. INTERVAL COSTS

3.2 MUD TYPE : NaCl-POLYMER / KCl-POLYMER
HOLE SIZE : 12 1/4"
INTERVAL : 341 m - 1869 m

PRODUCT	SIZE	UNIT COST	USED	$COST	%COST
Caustic Soda	25 kg	$28.88	42	$1,212.96	5.5
D.I.Cide	25 lt	$108.88	1	$108.88	0.5
KCl	50 kg	$17.75	320	$5,680.00	25.7
NaCl	50 kg	$8.75	200	$1,750.00	7.9
PAC	25 kg	$91.88	98	$9,004.24	40.8
Polysal	25 kg	$42.88	79	$3,387.52	15.3
Soda Ash	40 kg	$19.40	7	$135.80	0.6
Sodium Nitrate	50 kg	$39.75	7	$278.25	1.3
Spersene	25 kg	$25.88	20	$517.60	2.3
			Total =	$22,075.25	100.0

Cost per Metre = $14.45

3. INTERVAL COSTS

3.3 MUD TYPE : KCl-POLYMER / WATER / F.W. POLYMER
HOLE SIZE : 8 1/2"
INTERVAL : 1869 m - 3595 m

PRODUCT	SIZE	UNIT COST	USED	$COST	%COST
Ammonium Nitrate	50 kg	$17.51	8	$140.08	1.1
Barytes	50 kg	$9.60	72	$691.20	5.6
Bicarb Soda	40 kg	$20.40	7	$142.80	1.1
Caustic Soda	25 kg	$28.88	29	$837.52	6.7
MagcoGel	100 lb	$18.60	11	$204.60	1.6
PAC	25 kg	$91.88	55	$5,053.40	40.6
Polysal	25 kg	$42.88	104	$4,459.52	35.8
Soda Ash	40 kg	$19.40	4	$77.60	0.6
Sodium Nitrate	50 kg	$39.75	16	$636.00	5.1
Sodium Sulphite	50 kg	$29.75	6	$178.50	1.4
Sodium Sulphite	25 kg	$15.00	2	$30.00	0.2
			Total =	$12,451.22	100.0

Cost per Metre = $7.21

3.4 TOTAL MATERIALS CONSUMPTION

WELL : WINDERMERE # 2
INTERVAL : 0 m - 3595 m

PRODUCT	SIZE	UNIT COST	USED	$COST	%COST
Ammonium Nitrate	50 kg	$17.51	8	$140.08	0.4
Barytes	50 kg	$9.60	72	$691.20	1.9
Bicarb Soda	40 kg	$20.40	7	$142.80	0.4
Caustic Soda	25 kg	$28.88	72	$2,079.36	5.7
D.I.Cide	25 lt	$108.88	1	$108.88	0.3
KCl	50 kg	$17.75	400	$7,100.00	19.5
Kwik Thik	25 kg	$11.18	40	$447.20	1.2
Lime	25 kg	$8.38	4	$33.52	0.1
MagcoGel	100 lb	$18.60	11	$204.60	0.6
NaCl	50 kg	$8.75	200	$1,750.00	4.8
PAC	25 kg	$91.88	153	$14,057.64	38.6
Polysal	25 kg	$42.88	183	$7,847.04	21.5
Soda Ash	40 kg	$19.40	11	$213.40	0.6
Sodium Nitrate	50 kg	$39.75	23	$914.25	2.5
Sodium Sulphite	50 kg	$29.75	6	$178.50	0.5
Sodium Sulphite	25 kg	$15.00	2	$30.00	0.1
Spersene	25 kg	$25.88	20	$517.60	1.4
			Total Cost for Well =	$36,456.07	100.0

Cost per Metre for Well = $10.14

I.D.F.S.

4. FLUID PROPERTIES SUMMARY

DATE	DEPTH (Metre)	F.L. TEMP	MUD WT.	VIS.	P.V.	Y.P.	GELS.	W.L.	SOLIDS %	MBC.	pH	Pm	Pf/Mf	KCl %	Cl-	Ca++	SO3--	COST $
10-Mar-89	100		8.4	27							8				700	120		$269.24
10-Mar-89	341		9.15	46														
11-Mar-89	341		9.15	46	10	27	14/24		5.5	17.5	8		0.1/0.2	1.5	9000	560		$1,921.22
12-Mar-89	341		9.05	34	6	11	7/13		5	15	8		0.1/0.3	1.2	7000	480		$1,921.22
12-Mar-89	470		9	41	9	17	10/22		4		9.5		0.1/0.2	0.8	25500	800		
13-Mar-89	725		8.75	41	9	15	4/7	16.4	2.5	7.5	9.5		0.1/0.3	0.5	19500	240		$3,457.32
13-Mar-89	898		9.15	45	10	13	3/16	8.8	4.5	17.5	9		0.1/0.3	0.2	32000	200		
14-Mar-89	1068		9.3	44	10	12	7/19	8.8	6	20	9		0.1/0.3	0.2	28000	240		$7,029.65
14-Mar-89	1197		9.45	45	11	19	4/16	9.6	7	20	8.7		0.1/0.2	1.5	34000	320		
15-Mar-89	1304	47	9.45	45	11	14	4/14	8	7	20	8.8		0.1/0.2	1.5	27000	280		$8,201.18
15-Mar-89	1446		9.5	46	10	17	6/24	9.8	7.5	25	8.6		0.1/0.3	2.8	28000	460		
16-Mar-89	1612	45	9.4	44	9	16	8/18	12.4	7	25	8.8		0.1/0.4	2.3	24000	480		$10,829.12
16-Mar-89	1743		9.35	42	9	13	3/11	6.4	6.8	22.5	9.3		0.1/0.4	1.8	17500	280		
17-Mar-89	1743		9.35	41	9	12	2/7	6.4	6.8	22.5	9.3		0.1/0.4	2	18500	280		$13,977.08
17-Mar-89	1748		9.4	40	9	12	2/6	6.6	6.9	22.5	9.3		0.1/0.4	3.2	25000	280		
18-Mar-89	1748		9.45	39	9	12	2/7	6.8	7.3	25	9.3		0.1/0.4	3.2	25000	300		$16,420.67
18-Mar-89	1777		9.4	41	9	13	2/6	6.4	7	20	9.7		0.2/0.5	3	24000	240		
19-Mar-89	1788		9.3	43	8	15	3/7	6.8	6.3	17.5	9.9		0.2/0.6	2.6	21000	120		$19,481.21
19-Mar-89	1803		9.3	41	10	15	2/6	6.8	6.4	17.5	9.9		0.2/0.6	2.5	20000	100		
20-Mar-89	1803		9.25	42	10	15	2/7	6.6	6	17.5	10		0.2/0.7	2.5	20000	100		$21,053.27
21-Mar-89	1805		9.2	42	11	16	2/5	6.8	5.5	17.5	10		0.2/0.6	2.6	22000	80		$21,237.03
21-Mar-89	1869		9.2	44	12	19	2/7	6.5	5.5	17.5	9.7		0.2/0.5	2.7	22000	100		
22-Mar-89	1869		9.2	43	12	17	2/7	6.5	5.5	17.5	9.7		0.2/0.5	2.7	22000	100		$22,625.33
22-Mar-89	1764		9.3	44	12	20	2/6	6.2	6.2	17.5	8.8		0.1/0.5	2.8	24000	180		
23-Mar-89	1816		9.2	41	11	14	2/5	6.4	5.6	17.5	8.8		0.1/0.4	2.7	21000	180		$22,683.09
23-Mar-89	1869		9.3	39	13	12	2/5	6.8	6.3	17.5	9.1		0.1/0.4	2.7	21000	140		$24,097.85
24-Mar-89	1869		9.5	40				5.4	7.9		9		0.1/0.3		22000	120		$24,097.85
26-Mar-89	1869		9.3	35	8	7	1/3	8	6.4		11.5	2.8	0.7/1.1	2.8	22000	100		$24,097.85
27-Mar-89	1886	47	9.2	34	7	6	1/3	7.4	5.6	15	10.5	1.8	0.4/0.9	2.8	22000	80		$24,220.25
27-Mar-89	1949	48	9.3	32	5	3	1/2	9.3	6.5	17.5	10.5	1.6	0.4/0.7	2.6	20500	200	80	
28-Mar-89	2036	49	9.4	32	5	3	1/2	10.2	7.3	20	10	1.3	0.2/0.5	2.4	19000	360	80	$24,359.25
29-Mar-89	2215	31	8.45								8.5		Tr/0.5	0.8	9000	460		$24,428.75
30-Mar-89	2301	31	8.45								7.5		0/0.2	0.8	9000	520		$24,520.63
31-Mar-89	2403	31	8.45								7.5		0/0.2	0.8	8500	560		$24,520.63
1-Apr-89	2517	42	8.4								7.5		0/0.3	0.7	9000	680		$24,520.63
2-Apr-89	2604	33	8.4								7.5		0/0.2	0.7	8500	680		$24,520.63
3-Apr-89	2775	40	8.4								7		0/0.3		1200	240		$24,560.38
4-Apr-89	2903	45	8.55	30	5	2	1/1	11.5	1.6	2.5	9		0.1/0.3		1400	200	60	$26,411.85
4-Apr-89	2927	49	8.55	31	5	3	1/1	9	1.6	2.5	9		0.1/0.3		1400	180	60	
5-Apr-89	3004	51	8.65	30	4	2	1/1	8.5	2.4	6	10	1.6	0.4/0.9		1500	20	120	$28,569.52
5-Apr-89	3034	50	8.75	30	4	2	1/1	7.5	3.1		9.5	1.3	0.3/0.8		1500	20	60	
6-Apr-89	3072	52	8.8	30	4	2	1/2	7.8	3.5	6	9.5	1.1	0.2/0.6		1400	40	40	$29,232.21
6-Apr-89	3144	52	8.9	28	3	1	1/1	8	4.2	6	9		0.2/0.5		1500	40	0	

DATE	DEPTH (Metre)	F.L. TEMP	MUD WT.	VIS.	P.V.	Y.P.	GELS.	W.L.	SOLIDS %	MBC.	pH	Pm	Pf/Mf	KCl %	Cl-	Ca++	SO3--	COST $
7-Apr-89	3201	54	9.05	30	4	4	2/7	8.2	5.4	10	9		0.2/0.5		1500	100	0	$30,210.64
7-Apr-89	3231	52	9.15	32	5	5	2/8	7.4	6.1	12	9	1	0.2/0.4		1500	120	0	$30,849.65
8-Apr-89	3231		9.05	30	5	4	2/5	7.7	5.4	12	9		0.1/0.4		1500	140	0	$30,849.65
10-Apr-89	3255	51	9.05	32	6	7	3/9	8.3	5.4	15	9	0.8	0.1/0.3		1500	180		$31,127.95
10-Apr-89	3320	54	9.15	32	4	5	2/8	8	6.1	16	9	0.8	0.2/0.6		1500	80		
11-Apr-89	3351	55	9.2	34	6	6	3/10	7.5	6.5	15	9	0.7	0.1/0.5		1400	100		$31,748.55
11-Apr-89	3436	56	9.25	33	5	6	2/8	8.3	6.9	14	9.5	0.8	0.2/0.6		1500	80		
12-Apr-89	3450	57	9.25	34	6	7	3/10	8.2	6.9	14	9	0.5	0.1/0.4		1500	80		$32,631.51
12-Apr-89	3494	59	9.3	33	6	6	3/11	8.6	7.2	15	9	0.6	0.1/0.5		1400	80		
13-Apr-89	3530	58	9.35	35	8	7	4/14	8.8	7.6	16	9	0.7	0.2/0.6		1400	100		$33,604.59
13-Apr-89	3560	60	9.35	37	9	7	3/12	11.4	7.6	17.5	9	0.6	0.1/0.5		1400	100		
14-Apr-89	3595	60	9.35	37	9	8	5/16	7.5	7.6	17.5	9.5	0.8	0.2/0.8		1400	100		$35,154.35
14-Apr-89			9.35	38	10	8	4/16	7.5	7.6	17.5	9.5	0.8	0.2/0.8		1400	100		$35,327.15
15-Apr-89	3595	58	9.4	34	9	7	3/13	7.8	8	17.5	9		0.2/0.5		1400	120		$35,897.71
17-Apr-89	3595	52	9.45	33	7	6	3/9	10.2	8.4	20	9		0.1/0.5		1400	120		$35,990.71
17-Apr-89	3595	56	9.45	34	8	7	3/11	7.6	8.4	20	9		0.2/0.6		1400	120		$36,456.07

5.1 MUD VOLUME ANALYSIS
12 1/4" HOLE

DATE	INITIAL VOLUME	PREMIX ADDED	WATER ADDED	DESANDER-DESILTER U.F.	DUMPED	LOST TO HOLE	TOTAL MUD DISPOSED	FINAL VOLUME
13-Mar-89	770	280	70	50	60		110	1010
14-Mar-89	1010	70	56	66	40		106	1030
15-Mar-89	1030	140	384	84	95		179	1375
16-Mar-89	1375	210	90	47	258		305	1370
17-Mar-89	1370	140	30	12	78	30	120	1420
18-Mar-89	1420	280	20	12	341	27	380	1340
19-Mar-89	1340		89	22	55		77	1352
20-Mar-89	1352		51	10			10	1393
21-Mar-89	1393		31	14	10		24	1400
22-Mar-89	1400		54	11			11	1443
23-Mar-89	1443				120		120	1323

TOTAL MUD VOLUME MIXED : 1995 bbls

MUD LOST THROUGH DESANDER & DESILTER : 328 bbls
MUD DUMPED : 1057 bbls
MUD LOST TO HOLE : 57 bbls

TOTAL MUD DISPOSED : 1442 bbls

NOTE : All Mud Volumes calculated from Drill Out on 12 1/4" hole.

5.2 MUD VOLUME ANALYSIS
8 1/2" HOLE

DATE	INITIAL VOLUME	PREMIX ADDED	WATER ADDED	DESANDER-DESILTER U.F.	DUMPED	LOST TO HOLE	TOTAL MUD DISPOSED	FINAL VOLUME
3-Apr-89	0	0	1075	15			15	1060
4-Apr-89	1060	70	25	30			30	1125
5-Apr-89	1125		40	15			15	1150
6-Apr-89	1150		40	50			50	1140
7-Apr-89	1140	75		45		25	70	1145
8-Apr-89	1145						0	1145
9-Apr-89	1145						0	1145
10-Apr-89	1145	20	80	75			75	1170
11-Apr-89	1170	25	95	60			60	1230
12-Apr-89	1230		90	75			75	1245
13-Apr-89	1245	20		40			40	1225
14-Apr-89	1225						0	1225
15-Apr-89	1225						0	1225

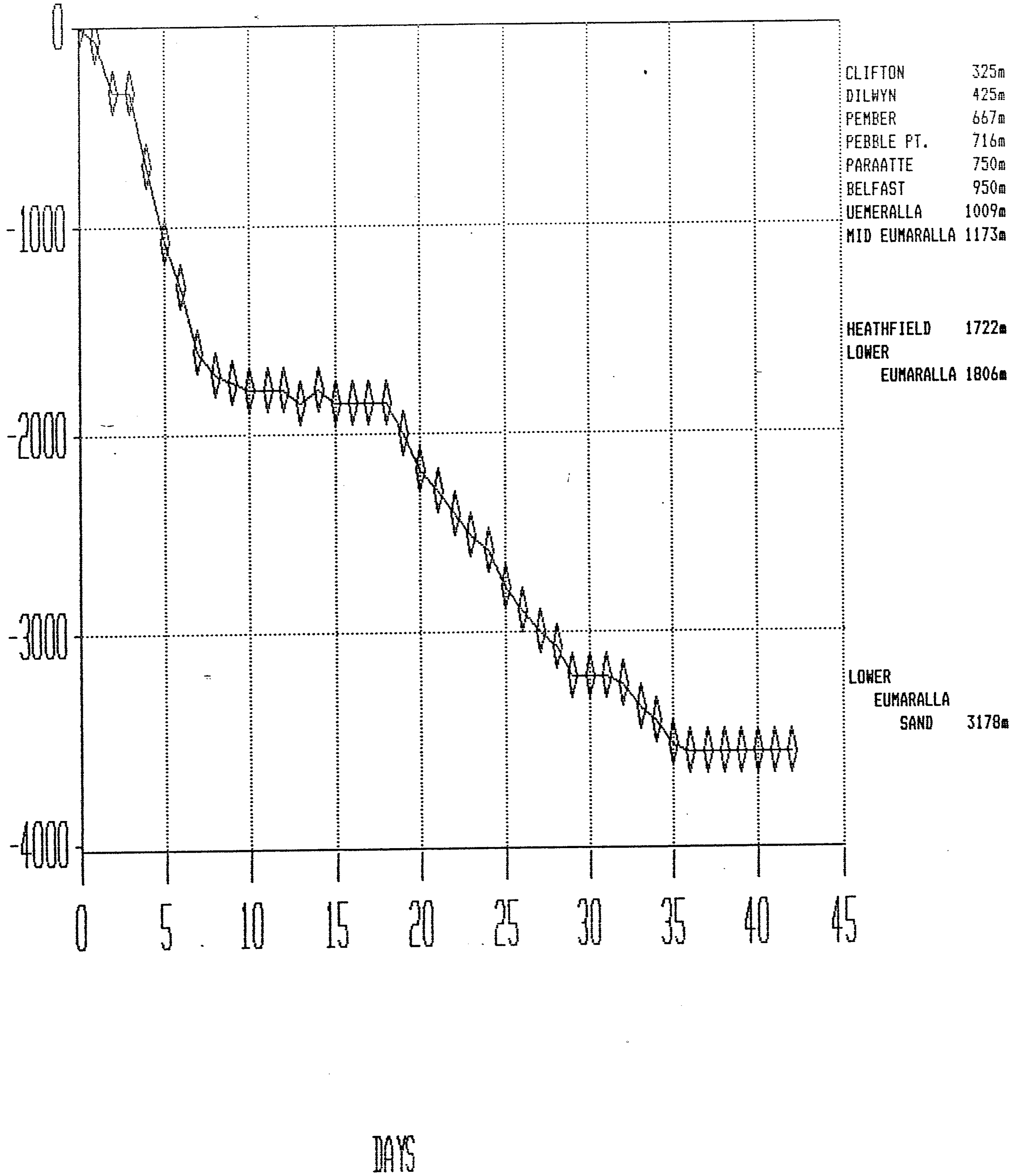
TOTAL MUD VOLUME MIXED : 1655 bbls

MUD LOST THROUGH DESANDER & DESILTER : 405 bbls
MUD DUMPED : bbls
MUD LOST TO HOLE : 25 bbls

TOTAL MUD DISPOSED : 430 bbls

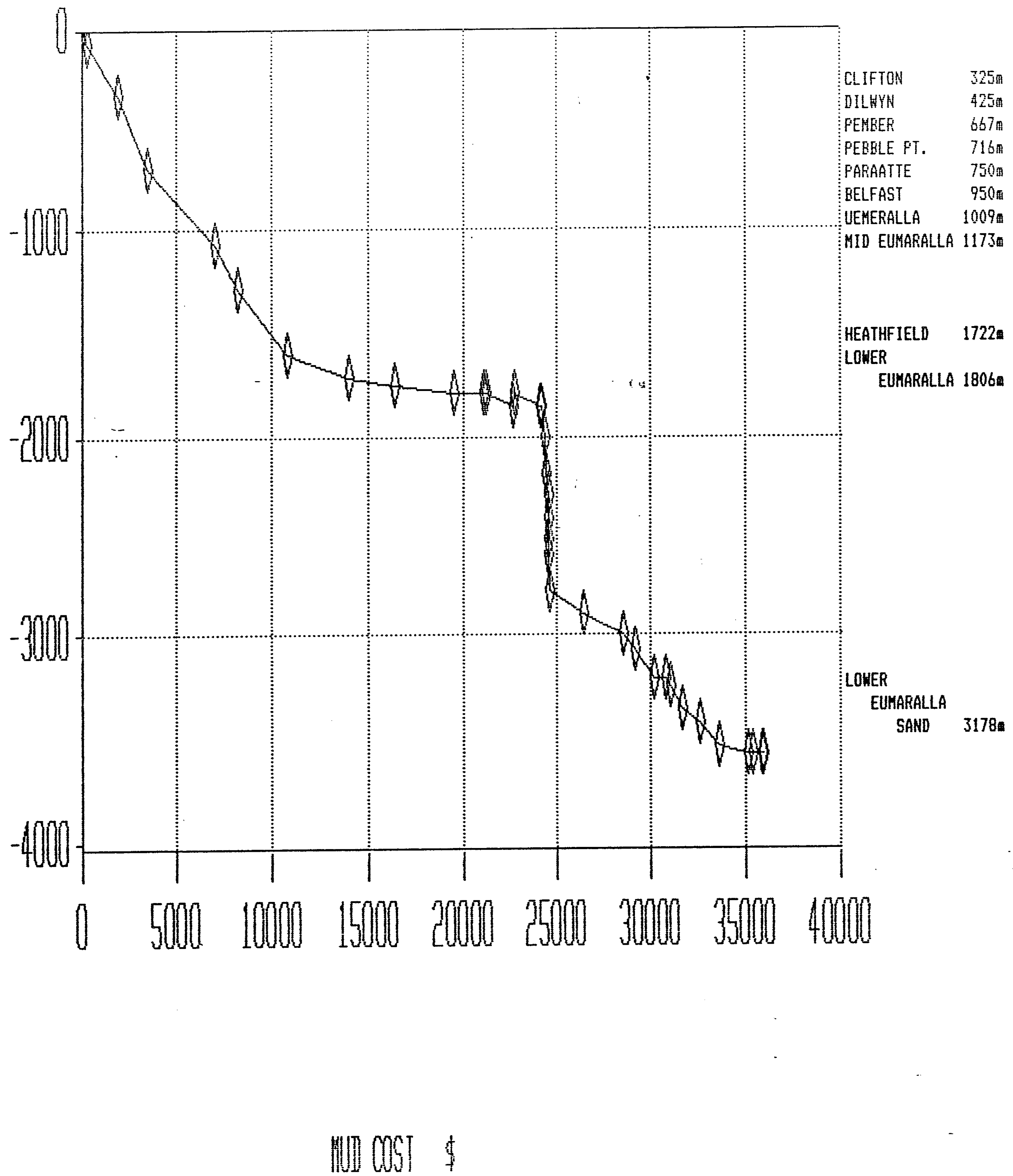
NOTE : All Mud Volumes calculated from Mudding up on 8 1/2" hole.

6.1 DEPTH vs DAYS

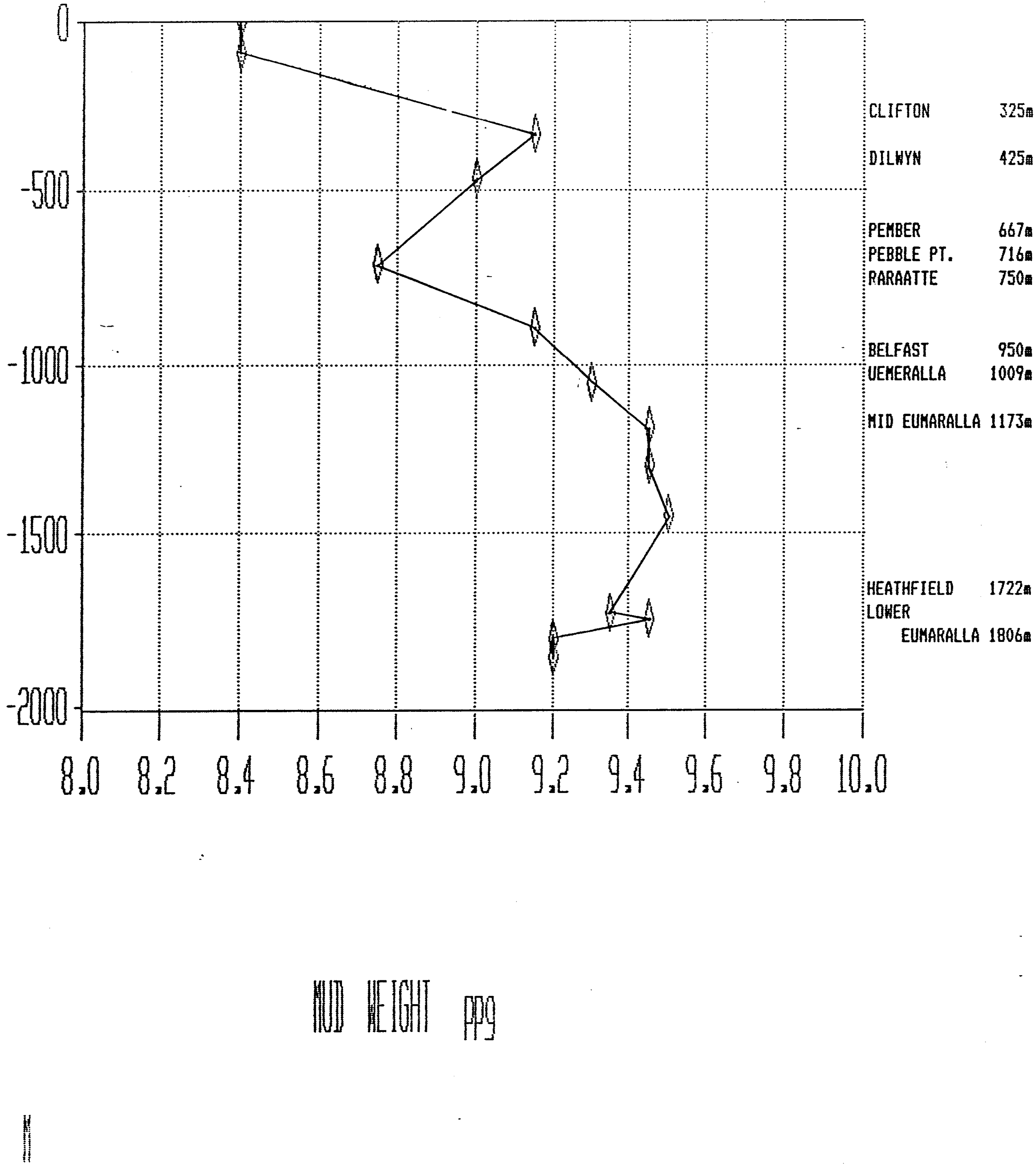


◊ DEPTH v

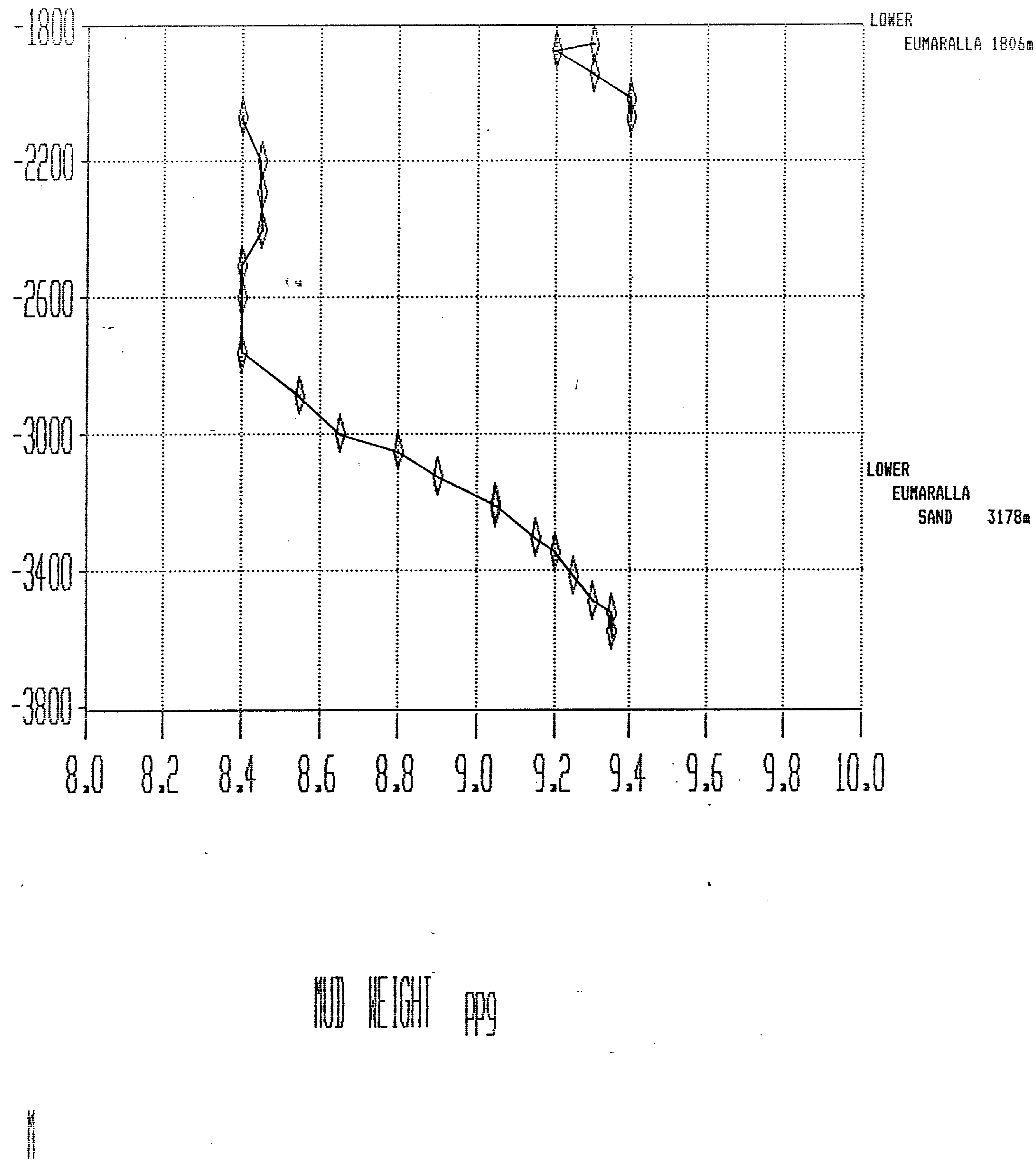
6.2 DEPTH vs MUD COST



6.3.1 DEPTH vs MUD WT. - TOP HOLE

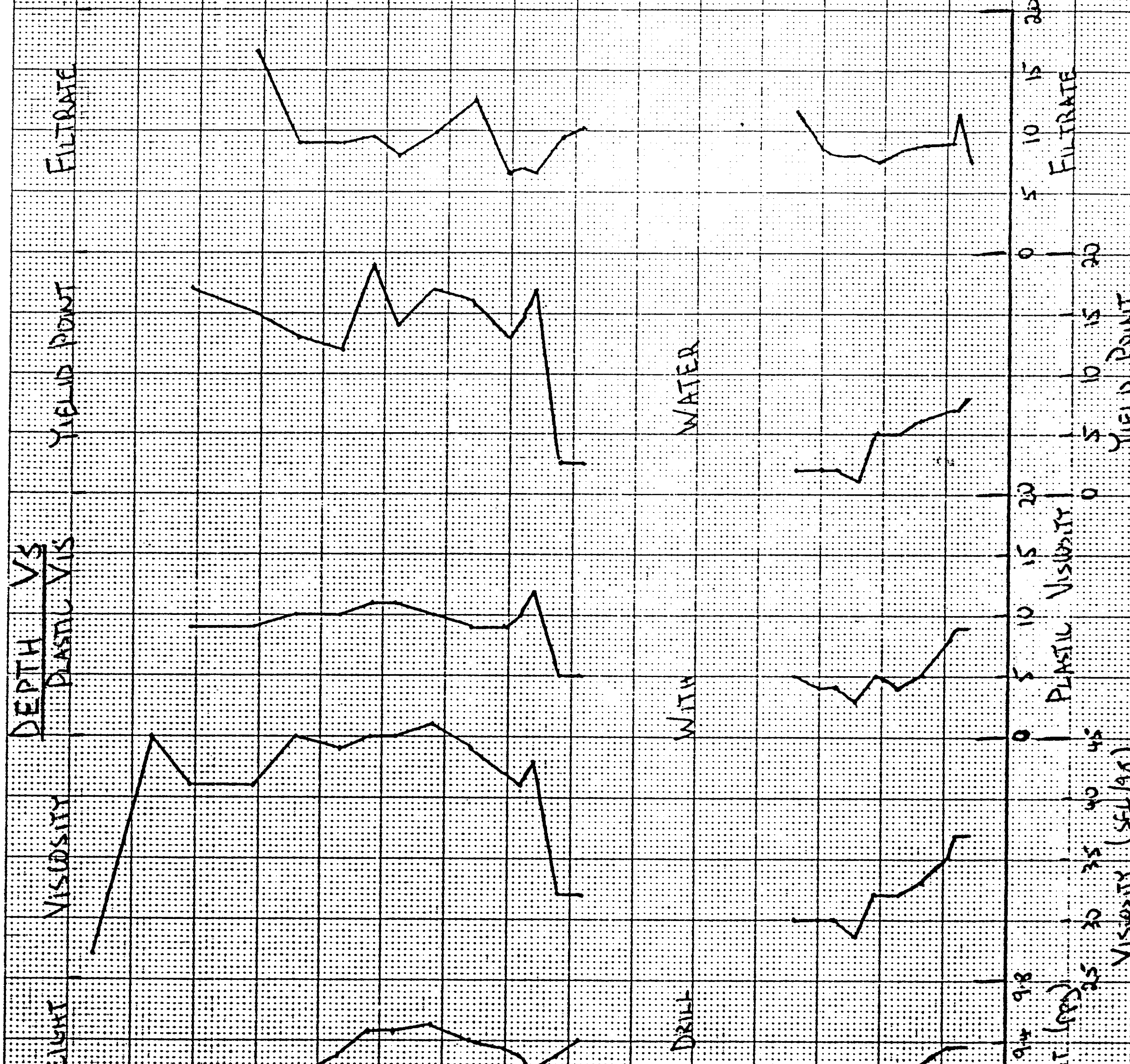


6.3.2 DEPTH vs MUD WEIGHT - 8 1/2" HOLE



I.D.F.S.

6.4 COMPILATION GRAPHS



I.D.F.S.

7. BIT RECORD

OPERATOR : MINORA RESOURCES | WELL : WINDERMERE # 2 | CONTRACTOR : ATCO APM # A2 | SUPERVISORS : JURIS OZOLINS

SPUD DATE : 9-Mar-89 | T.D. DATE : 13-Apr-89 | SURFACE CSG : 13 3/8" @ 313m | INTER CSG : 9 5/8" @ 1867m | PROD CSG : P & A

Bit No.	Size	Make	Type	Jets	Depth Out	Depth Drilled	Hours	Cum Hours	WOB	RPM	Max Dev	GPM	Pump Press	Ann Vel	Mud Wt.	Vis	W.L.	Bit Con T	Bit Con B	Bit Con G	Reason Pulled
1	17 1/2	Varel	L114	3 x 22	341	331	14.5	14.5	2-20	120	0	715	1200	61	9.1	46		2	2	I	Casing
2	12 1/4	Varel	L135	14.14.22	1197	856	36.5	51	20-30	120	1/2	571	1550	103	9.3	44	8.8	7	5	1/8	Hours
3	12 1/4	Reed	S13G	14.14.22	1744	547	41.5	92.5	35-40	110	0	482	1600	87	9.3	41	6.4	7	8	1/8	Core # 1
CH1	8 1/2"	Chris	RC476	TFA	1749	5	10.5	103	8-10	75		263	500	124	9.4	39	6.8	5	%	Worn	
4	8 1/2"	Reed	HP51A	11.12.12	1777	28	3.5	106.5	30	60		367	1600	173	9.3	41	6.4	1	1	I	Core # 2
CH1	8 1/2"	Chris	RC476	TFA	1794	17	12	118.5	10	80		257	500	121	9.3	41	6.8	25	%	Worn	
4RR	8 1/2"	Reed	HP51A	11.12.12	1802	8	1	119.5	30	60		367	1600	173	9.2	42	6.6	1	1	I	DST # 1
4RR	8 1/2"	Reed	HP51A	3 x 11	1869	67	9	128.5	30-40	60	1	306	1425	144	9.2	43	6.5	2	2	I	Logs
5	12 1/4	Reed	FP31G	14.14.22			15.5		15-25	85		576	2300	109	9.3	39	6.8	2	2	I	Open Hole
6	8 1/2"	Reed	HP43A	10.14.B	2261	392	54	182.5	40	70	1 1/2	288	1775	136	8.4	26		2	2	1/16	New Bit
7	8 1/2"	L'Year	DP13	6 x 9	2317	56	9	191.5	15	90	1 1/4	317	1125	149	8.4	26		5	%	Worn	Uneconomic
8	8 1/2"	Varel	V437	10.14.B	2403	86	11.5	203	40	70	2 1/2	300	1800	141	8.4	26		1	1	I	Washed Jet
9	8 1/2"	Reed	S31G	10.14.B	2603	200	32	235	40	70	2	317	2075	149	8.4	26		5	7	I	Hours
10	8 1/2"	Reed	HP43A	10.13.B	3005	402	60	295	40	70	2	300	2250	141	8.5	30	12	6	8	1/16	Washed Bit
RR4	8 1/2"	Reed	HP51A	10.13.B	3231	226	37	332	40	75	5	300	2350	141	9	30	8	2	3	I	DST # 2
11	8 1/2"	Reed	HP51A	10.13.B	3595	364	93	425	43	70		285	2250	134	9.2	34	8	8	8	LC	Torque/Log
RR4	8 1/2"	Reed	HP51A	3 x 13	3595				5-15	80		285	1200	134	9.4	34	7.8	4	4	1/4	Clean Out
RR6	8 1/2"	Reed	HP43A	12.13.13	3595				5-15	80		347	1700	164	9.4	33	10.2	4	2	1/8	Clean Out

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 1

DATE 10 MAR 1989	DEPTH 101	
SPUD DATE 9-3-89	PRESENT ACTIVITY DRILL AHEAD.	

OPERATOR MINORA RESOURCES NL	CONTRACTOR ATCO DRILLING	RIG NO. A2
REPORT FOR U. OZOLINS	REPORT FOR K. MURPHY.	SECTION, TOWNSHIP, RANGE

WELL NAME AND NO.	FIELD OR BLOCK NO.	COUNTY, PARISH OR OFFSHORE AREA	STATE/PROVINCE
WINDERMERE #2	PEP 111	OTWAY BASIN	VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	TYPE	JET SIZE		
17½	VAREL L114	3×22		
DRILL PIPE SIZE	TYPE	LENGTH		
DRILL PIPE SIZE	TYPE	LENGTH		
DRILL COLLAR SIZE		LENGTH		
6½"/8"		101		

CASING	
SURFACE	in. @ ft.
INTERMEDIATE	in. @ ft.
INTERMEDIATE	in. @ ft.
PRODUCTION OR LINER	in. @ ft.

MUD VOLUME (BBL)	
HOLE 80	PITS 440
TOTAL CIRCULATING VOLUME 520	
IN STORAGE 140	WEIGHT 6% KCl BRINE
MUD TYPE WATER / Hi Vis SWEEPS	

CIRCULATION DATA		
PUMP SIZE 6 X 8½ IN. / 6 × 15		ANNULAR VEL (ft/min) DP/DC 6½"/162 DC 8"/6
PUMP MAKE, MODEL NAT 8-P-80 / NAT K500A	ASSUMED EFF 97 / 95 %	CIRCULATION PRESSURE (psi) 100
bbl/stk 0.10	stk/min 160	BOTTOMS UP (min) 5 (strk) 800
16 bbl/min	672 gal/min	TOTAL CIRC TIME (min) 32.5 (strk) 5200

MUD PROPERTIES

	☐ F.L. ☑ PIT	☐ F.L. ☐ PIT
Sample From	PIT	
Time Sample Taken	05:30	
Fl Temperature (°F)		
Depth (m) (TVD / ft)	100	
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	8.4	
Funnel Viscosity (sec/qt) API @ °F	27	
Plastic Viscosity cp @ °F		
Yield Point (lb/100 ft²)		
Gel Strength (lb/100 ft²) 10 sec/10 min	/	/
Filtrate API (cm³/30 min)		
HTHP Filtrate (cm³/30 min) @ °F		
Cake Thickness (32nd in. API/HTHP)	/	/
Solids Content (% by Vol) ☐ calculated ☐ retort		
Liquid Content (% by Vol) Oil/Water	/	/
Sand Content (% by Vol)		
Methylene Blue Capacity ☐ lb/bbl equiv ☐ cm³/cm³ mud		
pH ☑ Strip ☐ Meter @ °F	8.0	
Alkalinity Mud (P_m)		
Alkalinity Filtrate (P_f/M_f)	/	/
Chloride (mg/L)	700	
Total Hardness as Calcium (mg/L)	120	

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
H_2O		

RECOMMENDED TOUR TREATMENT

DRILL WATER : 160 ppm CALCIUM
700 ppm CHLORIDES.
MUD ENGR ON LOCATION 9 MAR '89.

- MADE UP 140 BBLS 6% KCl BRINE.

REMARKS

- SPUD IN 17½" HOLE @ 23:00 HRS ON 9 MAR 89.
- DRILL AHEAD WITH H_2O USING Hi Vis SWEEPS AS REQUIRED.
- LOSSES DOWNHOLE UP TO 40 BBLS PER CONNECTIO[N] DOWN TO 50m. ~~R~~ JUST MINOR LOSSES AT PRESENT DEPTH - 101m

PRODUCT INVENTORY

PRODUCT INVENTORY	KWIK THIK	CAUSTIC	LIME
STARTING INVENTORY			
RECEIVED			
USED LAST 24 hr	20	1	2
CLOSING INVENTORY			
COST LAST 24 hr	223.60	28.88	16.76
~~USED~~ UNIT ~~(from IADC)~~ COST.	11.18	28.88	8.38

SOLIDS EQUIPMENT

SHAKER #1	B40, B60. me
SHAKER #2	B40, B60 me
MUD CLEANER	— me
CENTRIFUGE	— ho
DESANDER	— ho
DESILTER	— ho

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555805		$269.24	$269.24.

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO — A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 2

DATE 11 MAR 19 89 | DEPTH 341 m
SPUD DATE 9-3-89 | PRESENT ACTIVITY RUN CMT.

OPERATOR: MINORA RESOURCES NL	CONTRACTOR: ATCO DRILLING
REPORT FOR: V. OZOLINS	REPORT FOR: K. MURPHY
RIG NO. A2	SECTION, TOWNSHIP, RANGE: —
WELL NAME AND NO.: WINDERMERE #2	FIELD OR BLOCK NO.: PEP 111
COUNTY, PARISH OR OFFSHORE AREA: OTWAY BASIN	STATE/PROVINCE: VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

DRILLING ASSEMBLY	CASING	MUD VOLUME (BBL)	CIRCULATION DATA
BIT SIZE / TYPE / JET SIZE	SURFACE $13\frac{3}{8}$ in. @ ft	HOLE 300 / PITS 420	PUMP SIZE 6 x $8\frac{1}{2}$ IN.; 6 x 15
DRILL PIPE SIZE / TYPE / LENGTH	INTERMEDIATE in. @ ft	TOTAL CIRCULATING VOLUME 720	PUMP MAKE, MODEL: NAT 8-P-80; NAT K500A — ASSUMED EFF 97, 95 %
DRILL PIPE SIZE / TYPE / LENGTH	INTERMEDIATE in. @ ft	IN STORAGE — / WEIGHT —	bbl/stk; stk/min
DRILL COLLAR SIZE / LENGTH	PRODUCTION OR LINER in. @ ft	MUD TYPE: KCl / NATIVE CLAYS	bbl/min; gal/min

ANNULAR VEL (ft/min) DP DC; CIRCULATION PRESSURE (psi); BOTTOMS UP (min) (strk); TOTAL CIRC TIME (min) (strk)

MUD PROPERTIES

	☐ F.L. ☑ PIT	☐ F.L. ☑ PIT
Sample From		
Time Sample Taken	18:00	05:30
Flo. Temperature (°F)		—
Depth (m) (TVD / ft)	341	341
Weight ☐ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.1+	9.1+
Funnel Viscosity (sec/qt) API @ °F	46	46
Plastic Viscosity cp @ °F		10
Yield Point (lb/100 ft²)		27
Gel Strength (lb/100 ft²) 10 sec/10 min	/	14/24
Filtrate API (cm³/30 min)		N.C.
API HTHP Filtrate (cm³/30 min) @ °F		—
Cake Thickness (32nd in. API/HTHP)	/	4
Solids Content (% by Vol) ☑ calculated ☐ retort		5.5
Liquid Content (% by Vol) Oil/Water	/	0/94.5
Sand Content (% by Vol)		0.25
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm³/cm³ mud		17.5
pH ☑ Strip ☐ Meter @ °F		8.0
Alkalinity Mud (P_m)		—
Alkalinity Filtrate (P_f/M_f)	/	.05/1.2
Chloride (mg/L)		9,000
Total Hardness as Calcium (mg/L)		560
% KCl BY WT	1.5	~~2.0~~

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

- ADDED 280 BBLS 8% KCl BRINE.
- RAN HI VIS SWEEPS AS REQUIRED.

REMARKS

- DRILL $17\frac{1}{2}$" TO 341 m
- CIRC HOLE CLEAN
- RUN $13\frac{3}{8}$" CSG.
- CIRC PRIOR TO RUNNING CMT.

PRODUCT INVENTORY

PRODUCT INVENTORY	KWIK THIK	KCl AG	LIME
STARTING INVENTORY	160	450	48
RECEIVED			
USED LAST 24 hr	20	80	1
CLOSING INVENTORY	140	370	47
COST LAST 24 hr	223.60	1420.00	8.38
UNIT COST	11.18	17.75	8.38

SOLIDS EQUIPMENT

- SHAKER #1 B40, B60 mesh
- SHAKER #2 B40, B60 mesh
- MUD CLEANER — mesh
- CENTRIFUGE 9 hours
- DESANDER $9\frac{1}{2}$ hours
- DESILTER $9\frac{1}{2}$ hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		\$ 1651-98	\$ 1921-22

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 3

DATE 12 MAR 19 89 DEPTH 341 m
SPUD DATE 9-3-89 PRESENT ACTIVITY

OPERATOR: MINORA RESOURCES NL	CONTRACTOR: ATCO DRILLING		RIG NO. A2.
REPORT FOR: U. OZOLINS	REPORT FOR: K. MURPHY		SECTION, TOWNSHIP, RANGE: —
WELL NAME AND NO.: WINDEMERE #2	FIELD OR BLOCK NO.: PEP 111	COUNTY, PARISH OR OFFSHORE AREA: OTWAY BASIN	STATE/PROVINCE: VIC

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA			
BIT SIZE	TYPE	JET SIZE	SURFACE $13\frac{3}{8}$ in. @ ft.	HOLE 180	PITS 380	PUMP SIZE 6 X 8½ IN. / 6 x 15			ANNULAR VEL (ft/min) DP DC
DRILL PIPE SIZE	TYPE	LENGTH	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 560		PUMP MAKE, MODEL NAT 8-P-80 / NAT K500 A	ASSUMED EFF 97 / 95 %		CIRCULATION PRESSURE (psi)
DRILL PIPE SIZE	TYPE	LENGTH	INTERMEDIATE in. @ ft.	IN STORAGE	WEIGHT	bbl/stk	stk/min		BOTTOMS UP (min) (strk)
DRILL COLLAR SIZE		LENGTH	PRODUCTION OR LINER in. @ ft.	MUD TYPE KCl/NATIVE CLAYS		bbl/min	gal/min		TOTAL CIRC TIME (min) (strk)

MUD PROPERTIES	☐ F.L. ☐ PIT	☐ F.L. ☑ PIT
Sample From		
Time Sample Taken		05:30
Flowline Temperature (°F)		—
Depth (ft) m (TVD / ft)		341
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)		9.0+
Funnel Viscosity (sec/qt) API @ °F		34
Plastic Viscosity cp @ °F		8
Yield Point (lb/100 ft²)		11
Gel Strength (lb/100 ft²) 10 sec/10 min	/	7 / 13
Filtrate API (cm³/30 min)		N.C.
API HTHP Filtrate (cm³/30 min) @ °F		—
Cake Thickness (32nd in. API/HTHP)	/	+
Solids Content (% by Vol) ☑ calculated ☐ retort		5.0
Liquid Content (% by Vol) Oil/Water	/	0 / 95
Sand Content (% by Vol)		TRACE
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm³/cm³ mud		15.0
pH ☑ Strip ☐ Meter @ °F		8.0
Alkalinity Mud (P_m)		—
Alkalinity Filtrate (P_f/M_f)	/	.05 / 1.25
Chloride (mg/L)		7000
Total Hardness as Calcium (mg/L)		480
% KCl		1.2

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

- DUMPED + CLEANED SHAKER TANK.

REMARKS

- RUN TOP UP CEMENT JOB
- WORK ON BOP'S
- PRESSURE TEST.

PRODUCT INVENTORY		GEL	CaCl2	
STARTING INVENTORY		436	68	
RECEIVED				
USED LAST 24 hr	NIL IN MUD.	*27	*2	*USED IN CEMENT.
CLOSING INVENTORY		409	66	
COST LAST 24 hr				
USED (from IADC)				

SOLIDS EQUIPMENT

SHAKER #1 ____ / ____ m
SHAKER #2 ____ / ____ m
MUD CLEANER ____ m
CENTRIFUGE ____ hr
DESANDER ____ hr
DESILTER ____ hr

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		NIL	$ 1921-22.

DRILLING MUD REPORT

M-I Drilling Fluids Co. Magcobar/IMCO A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 4

DATE 13 MAR 19 89 | DEPTH 725 m
SPUD DATE 9-3-89 | PRESENT ACTIVITY DRILL 12¼"

OPERATOR MINORA RESOURCES NL	CONTRACTOR ATCO DRILLING		RIG NO. A2
REPORT FOR V. OZOLINS	REPORT FOR K. MURPHY		SECTION, TOWNSHIP, RANGE –
WELL NAME AND NO. WINDEMERE #2	FIELD OR BLOCK NO. PEP 111	COUNTY, PARISH OR OFFSHORE AREA OTWAY BASIN	STATE/PROVINCE VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE 12¼"	TYPE VAREL L135	JET SIZE 14,14,22	SURFACE 13⅜ in. @ 313 m	HOLE 430	PITS 340	PUMP SIZE 6 x 8½ IN. / 6 x 15		ANNULAR VEL (ft/min) 6½" DP 126 DC 152
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH ~~551~~ 495	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 770		PUMP MAKE, MODEL NAT 8-P-80 / NAT K500 A	ASSUMED EFF 97 / 90 %	CIRCULATION PRESSURE (psi) 1550
DRILL PIPE SIZE 4½	TYPE HW	LENGTH 56	INTERMEDIATE in. @ ft.	IN STORAGE –	WEIGHT –	bbl/stk .072 / .153	stk/min 100 / 55	BOTTOMS UP (min) 25 (strk) 3900
DRILL COLLAR SIZE 8" / 6½"		LENGTH 42 / 132.	PRODUCTION OR LINER in. @ ft.	MUD TYPE NaCl POLYMER		15.34 bbl/min	667 gal/min	TOTAL CIRC TIME (min) 48 (strk) 7500

MUD PROPERTIES

	☐ F.L. ☑ PIT	☐ F.L. ☐ PIT
Sample From		
Time Sample Taken	07:30	05:30
Flow Line Temperature (°F)	–	–
Depth (ft) m (TVD / ft)	470	725
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.0	8.7+
Funnel Viscosity (sec/qt) API @ °F	41	41
Plastic Viscosity cp @ °F	9	9
Yield Point (lb/100 ft²)	17	15
Gel Strength (lb/100 ft²) 10 sec/10 min	10/22	4/7
Filtrate API (cm³/30 min)	N.C.	16.4
HTHP Filtrate (cm³/30 min) @ °F	–	–
Cake Thickness (32nd in. API/HTHP)	1	1
Solids Content (% by Vol) ☑ calculated ☐ retort	4.0	2.5
Liquid Content (% by Vol) Oil/Water	0/96	0/97.5
Sand Content (% by Vol)	0.25	0.25
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm³/cm³ mud	–	7.5
pH ☑ Strip ☐ Meter @ °F	9.5	9.5
Alkalinity Mud (P_m)	–	–
Alkalinity Filtrate (P_f/M_f)	.1/1.2	.1/1.3
Chloride (mg/L)	25,500	19,500
Total Hardness as Calcium (mg/L)	800	240
% KCl	0.8	0.5
% NaCl		3.0
Nitrate ppm		50.

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
8.6 - 9.2	38 - 45	8 - 12 cc

RECOMMENDED TOUR TREATMENT

- WATER LOSS STILL HIGH DUE TO EXCESSIVE DILUTION WHL DRILLING FAST THRU DILWYN SAND.
- DUE TO LOSSES OVER THE SHAKERS THE SCREENS WER CHANGED FROM B80/B100 TO B20/B40.
- DESILTER + DESANDER PUTTING OUT 15 BBLS/HR.
- MUD LOGGERS ESTIMATE 150 BBLS O/GAUGE HOLE.

REMARKS

- RIH w/ 12¼" ASSEMBLY
- TAG CMT @ 301 m
- PRESS TEST PIPE RAMS, HYDRIL ETC
- DRILL OUT CMT, FLOAT + SHOE
- DRILL 12¼" F/341 - 344 m
- LEAK OFF TEST ENT TO 19.0 ppg MUD WEIGHT
- DRILL 12¼" F/344 - 725 m

PRODUCT INVENTORY

PRODUCT INVENTORY	NaCl	SPERSENE	SODA ASH	CAUSTIC	POLYSAL	SOD. NITRATE
STARTING INVENTORY	420	68	57	69	162	20
RECEIVED						
USED LAST 24 hr	80	10	5	2	8	2
CLOSING INVENTORY	340	58	52	67	154	18
COST LAST 24 hr	700.00	258.80	97.00	57.76	343.04	79.50
~~USED (from IADC)~~ UNIT COST	8.75	25.88	19.40	28.88	42.88	39.75

SOLIDS EQUIPMENT

SHAKER #1	B20, B40 me
SHAKER #2	B20, B40 me
MUD CLEANER	– me
CENTRIFUGE	9 ho
DESANDER	11 ho
DESILTER	11 ho

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		$ 1536.10	$ 3457.32.

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO — A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 5

DATE 14 MAR 19 89 | DEPTH 1068 m
SPUD DATE 9-3-89 | PRESENT ACTIVITY Drill $12\frac{1}{4}$"

OPERATOR: MINORA RESOURCES NL	CONTRACTOR: ATCO DRILLING	RIG NO. A2.
REPORT FOR: J. OZOLINS	REPORT FOR: K. MURPHY	SECTION, TOWNSHIP, RANGE: YAMBUK.
WELL NAME AND NO.: WINDEMERE #2	FIELD OR BLOCK NO.: PEP 111 / COUNTY, PARISH OR OFFSHORE AREA: OTWAY BASIN	STATE/PROVINCE: VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE $12\frac{1}{4}$"	TYPE VAREL L135	JET SIZE 14,14,22
DRILL PIPE SIZE $4\frac{1}{2}$	TYPE 16.6	LENGTH 838
DRILL PIPE SIZE $4\frac{1}{2}$	TYPE HW	LENGTH 56
DRILL COLLAR SIZE 8" / $6\frac{1}{2}$"		LENGTH 42/132

CASING SURFACE	$13\frac{3}{8}$ in. @ 313 m
INTERMEDIATE	in. @ ft
INTERMEDIATE	in. @ ft
PRODUCTION OR LINER	in. @ ft

HOLE F/LOGGERS 560	PITS 450
TOTAL CIRCULATING VOLUME 1010	
IN STORAGE —	WEIGHT —
MUD TYPE Na Cl POLYMER	

PUMP SIZE 6 x $8\frac{1}{2}$ IN.; 6 x 15	ANNULAR VEL (ft/min) $6\frac{1}{2}$" DP 105 DC 127
PUMP MAKE, MODEL: NAT 8-P-80; NAT K50CA — ASSUMED EFF 98; 95 %	CIRCULATION PRESSURE (psi) 1550
bbl/stk .0728 / .1502 — stk/min 100 / 40	BOTTOMS UP (min) 40 (strk) 5600
13.29 bbl/min — 558 gal/min	TOTAL CIRC TIME (min) 76 (strk) 10600

MUD PROPERTIES

	☐ F.L. ☑ PIT	☐ F.L. ☐ PIT
Sample From		
Time Sample Taken	15:30	05:00
Flow Line Temperature (°F)	—	—
Depth ~~(ft)~~ m (TVD / ft)	898	1068
Weight ☐ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.1+	9.3
Funnel Viscosity (sec/qt) API @ °F	45	44
Plastic Viscosity cp @ °F	10	10
Yield Point (lb/100 ft²)	13	12
Gel Strength (lb/100 ft²) 10 sec/10 min	3 / 16	7 / 19
Filtrate API (cm³/30 min)	8.8	8.8
HTHP Filtrate (cm³/30 min) @ °F	—	—
Cake Thickness (32nd in. API/HTHP)	1 /	1 /
Solids Content (% by Vol) ☑ calculated ☐ retort	4.5	6.0
Liquid Content (% by Vol) Oil/Water	0 / 95.5	0 / 94
Sand Content (% by Vol)	0.25	0.25
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm³/cm³ mud	17.5	20
pH ☑ Strip ☑ Meter @ °F	9.0	9.0
Alkalinity Mud (P_m)	—	—
Alk. Filtrate (P_f/M_f)	.05 / 12.5	.05 / 12.5
Chloride (mg/L)	32,000	28,000
Total Hardness as Calcium (mg/L)	200	240
% KCl	0.2	0.2
% NaCl	5.0	4.0
NITRATE ppm	50	100

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
8.6 - 9.2	38 - 45	8 - 12 cc

RECOMMENDED TOUR TREATMENT

- USING H_2O F/SUMP AS DRILL H_2O
  TEST ON SUMP H_2O 2,000 ppm CHLORIDES
  240 ppm CALCIUM
  pH 8.5
- REQUESTED BY MINORA TO USE KCl NOT NaCl.

REMARKS

- DRILL $12\frac{1}{4}$" F/725 - 898 m
- CIRC. POOH TO SHOE. HOLE STICKY IN PARTS
- RIH. ($\frac{1}{4}$ m FILL)
- DRILL $12\frac{1}{4}$" F/898 - 1068 m
  (CIRC SAMPLE @ 1013 m)

WATER ADDED - 70 BBLS
MUD BUILT - 280
MUD DISPOSED - 60
SOLIDS CONTROL - 50
NEW HOLE VOL - 130

PRODUCT INVENTORY

PRODUCT INVENTORY	NaCl	SPERSENE	CAUSTIC	PAC	NITRATE	POLYSAL
STARTING INVENTORY	340	58	67	168	18	154
RECEIVED						
USED LAST 24 hr	120	2	4	15	3	20
CLOSING INVENTORY	220	56	63	153	15	134
COST LAST 24 hr	1050.00	51.76	115.52	1378.20	119.25	857.60
UNIT COST	8.75	25.88	28.88	91.88	39.75	42.88

SOLIDS EQUIPMENT

SHAKER #1 B20, B40 mesh
SHAKER #2 B20, B40 mesh
MUD CLEANER — mesh
CENTRIFUGE 24 hours
DESANDER 24 hours
DESILTER 24 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		\$3572-33	\$7029-65.

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO — A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 6

DATE 15 MAR 19 89 | DEPTH 1304 m
SPUD DATE 9-3-89 | PRESENT ACTIVITY DRILL 12¼"

OPERATOR: MINORA RESOURCES NL	CONTRACTOR: ATCO DRILLING	RIG NO. A2
REPORT FOR: J. OZOLINS	REPORT FOR: K. MURPHY	SECTION, TOWNSHIP, RANGE: YAMBUK
WELL NAME AND NO.: WINDERMERE #2	FIELD OR BLOCK NO.: PEP 111	COUNTY, PARISH OR OFFSHORE AREA: OTWAY BASIN — STATE/PROVINCE: VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE 12¼"	TYPE REED S136	JET SIZE 14, 14 22	SURFACE 13⅜ in. @ 313 m	HOLE F/LOGGERS 630	PITS 400	PUMP SIZE 6 x 8½ IN.; 6 x 15 — ANNULAR VEL (ft/min) 12¼" DP 91 DC 110
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 1074	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 1030		PUMP MAKE, MODEL NAT 8-P-80, NAT K500A — ASSUMED EFF 98, 95 % — CIRCULATION PRESSURE (psi) 1550
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 56	INTERMEDIATE in. @ ft.	IN STORAGE –	WEIGHT –	bbl/stk .0728, .1502 — stk/min 100, 28 — BOTTOMS UP (min) 52 (strk) 6700
DRILL COLLAR SIZE 8" / 6½"		LENGTH 42/132	PRODUCTION OR LINER in. @ ft.	MUD TYPE NaCl/KCl POLYMER		11.49 bbl/min — 482 gal/min — TOTAL CIRC TIME (min) 90 (strk) 11520

MUD PROPERTIES

	☐ F.L. ☑ PIT	☑ F.L. ☐ PIT
Sample From		
Time Sample Taken	23:30	05:00
Flow Line Temperature °C	–	47
Depth m (TVD /)	1197	1304
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.4+	9.4+
Funnel Viscosity (sec/qt) API @ °F	45	45
Plastic Viscosity cp @ °F	11	11
Yield Point (lb/100 ft²)	19	14
Gel Strength (lb/100 ft²) 10 sec/10 min	4/16	4/14
Filtrate API (cm³/30 min)	9.6	8.0
HTHP Filtrate (cm³/30 min) @ °F	–	–
Cake Thickness (32nd in. API/HTHP)	1/	1/
Solids Content (% by Vol) ☑ calculated ☐ retort	7.0	7.0
Liquid Content (% by Vol) Oil/Water	0/93	0/93
Sand Content (% by Vol)	TRACE	TRACE
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm³/cm³ mud	17.5-20	20
pH ☐ Strip ☑ Meter @ °F	8.7	8.8
Alkalinity Mud (P_m)	–	–
Alkalinity Filtrate (P_f/M_f)	.05/2.0	.05/2.0
Chloride (mg/L)	34,000	27000
Total Hardness as Calcium (mg/L)	320	280
% KCl	1.5	1.5
% NaCl	3.5	2.5
NITRATE ppm	100+	100

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
8.6-9.2	38-45	8-12

RECOMMENDED TOUR TREATMENT

- USED 1x25 LT BIOCIDE BEFORE TRIPPING AS MUD TAKING SLIGHTLY MORE CAUSTIC THAN USUAL TO MAINTAIN pH – (MAY INDICATE START OF BACTERIAL ACTION

REMARKS

- DRILL 12¼" TO 1197 m
- P.OOH FOR NB
- P/U KELLY + WORK TITE HOLE F/905-885 m.
- PULL THRU TITE HOLE F/885-800 m
- RIH
- DRILL 12¼" F/1197-1304 m.

WATER ADDED – 56
MUD BUILT – 70
MUD DISPOSED – 40
SOLIDS CONTROL – 66
NEW HOLE VOL – 70

PRODUCT INVENTORY

PRODUCT INVENTORY	KCl	AG SPERSENE	CAUSTIC	NITRATE	B.I. CIDE
STARTING INVENTORY	360	56	63	15	25
RECEIVED					
USED LAST 24 hr	50	3	2	1	1
CLOSING INVENTORY	310	53	61	14	24
COST LAST 24 hr	887.50	77.64	57.76	39.75	108.88
UNIT COST	17.75	25.88	28.88	39.75	108.88

SOLIDS EQUIPMENT

SHAKER #1 B20, B40 mesh
SHAKER #2 B20, B40 mesh
MUD CLEANER mesh
CENTRIFUGE 22 hours
DESANDER 22 hours
DESILTER 22 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		$ 1171-53	$ 8201-18.

DRILLING MUD REPORT

M-I Drilling Fluids Co. Magcobar/IMCO — A Dresser/Halliburton Company

P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 7

DATE 16 MAR 1989 | DEPTH 1612 m

SPUD DATE 9-3-89 | PRESENT ACTIVITY DRILL 12¼"

OPERATOR	CONTRACTOR	RIG NO.
MINOURA RESOURCES NL	ATCO DRILLING	A2
REPORT FOR J. OZOLINS	REPORT FOR K. MURPHY	SECTION, TOWNSHIP, RANGE: YAMBUK

WELL NAME AND NO.	FIELD OR BLOCK NO.	COUNTY, PARISH OR OFFSHORE AREA	STATE/PROVINCE
WINDERMERE #2	PEP 111	OTWAY BASIN	VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE 12¼" · TYPE REED S13G · JET SIZE 14,14,22	SURFACE 13⅜ in. @ 313 m	HOLE F/LOGGERS 855 · PITS 520	PUMP SIZE 6 x 8½ IN. / 6 x 15 · ANNULAR VEL (ft/min) 6½" DP 91 DC 109
DRILL PIPE SIZE 4½" · TYPE 16.6 · LENGTH 1382	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 1375	PUMP MAKE, MODEL NAT 8-P-80 / NAT K500A · ASSUMED EFF 98 / 95 % · CIRCULATION PRESSURE (psi) 1600
DRILL PIPE SIZE 4½" · TYPE HW · LENGTH 56	INTERMEDIATE in. @ ft.	IN STORAGE 77 · WEIGHT 8.44	bbl/stk .0728 / .1502 · stk/min 75 / 40 · BOTTOMS UP (min) 68 (strk) 7900
DRILL COLLAR SIZE 8" / 6½" · LENGTH 42/132	PRODUCTION OR LINER in. @ ft.	MUD TYPE KCl POLYMER	bbl/min 11.47 · gal/min 482 · TOTAL CIRC TIME (min) 120 (strk) 13800

MUD PROPERTIES

	☐ F.L. ☑ PIT	☐ F.L. ☑ PIT
Sample From		
Time Sample Taken	14:30	04:30
Flow Line Temperature (°C)	–	45
Depth (m) (TVD / ft)	1446	1612
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.5	9.4
Funnel Viscosity (sec/qt) API @ °F	46	44
Plastic Viscosity cp @ °F	10	9
Yield Point (lb/100 ft²)	17	16
Gel Strength (lb/100 ft²) 10 sec/10 min	6 124	8 118
Filtrate API (cm³/30 min)	9.8	12.4
HTHP Filtrate (cm³/30 min) @ °F	–	–
Cake Thickness (32nd in. API/HTHP)	2 /	2 /
Solids Content (% by Vol) ☑ calculated ☐ retort	7.5	7.0
Liquid Content (% by Vol) Oil/Water	0 / 92.5	– / 93
Sand Content (% by Vol)	TRACE	TRACE
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm³/cm³ mud	25	25
pH ☐ Strip ☑ Meter @ °F	8.6	8.8
Alkalinity Mud (P_m)	–	–
Alkalinity Filtrate (P_f/M_f)	.05 / 1.3	.05 / 1.35
Chloride (mg/L)	28,000	24,000
Total Hardness as Calcium (mg/L)	460	480
% KCl	2.8	2.3
% NaCl	2.0	1.5
NITRATE ppm	200	200

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
8.6-9.2	38-45	8-12.

RECOMMENDED TOUR TREATMENT

- WEIGHT RISING FROM EUMERALLA CLAYS – DUMPING & DILUTING TO LOWER WEIGHT.
- JUST ADDED H_2O FOR LAST 12 HRS. WILL ADD 140 BBLS PREMIX JUST BEFORE HEATHFIELD MBR.
- WATER LOSS RISING AS NO STARCH OR POLYMERS ADDED IN LAST 12 HRS TO SAVE COSTS.

REMARKS

- DRILL 12¼" TO 1612 m

WATER ADDED	~~524~~ 384
MUD BUILT	140
MUD DISPOSED	95
SOLIDS CONTROL	84
NEW HOLE VOL (LOGGERS)	375

PRODUCT INVENTORY

PRODUCT INVENTORY	KCl AG	SPERSENE	CAUSTIC	POLYSAL	PAC
STARTING INVENTORY	310	53	61	134	153
RECEIVED					
USED LAST 24 hr	50	5	7	20	6
CLOSING INVENTORY	260	48	54	114	147
COST LAST 24 hr	50 887	40 129	16 202	60 857	28 551
UNIT COST	17 75	25 88	28 88	42 88	91 88

SOLIDS EQUIPMENT

- SHAKER #1 B40 / B100 mesh
- SHAKER #2 B40 / B100 mesh
- MUD CLEANER ____ mesh
- CENTRIFUGE 24 hours
- DESANDER 24 hours
- DESILTER 24 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		$2627-94	$10,829-12.

DRILLING MUD REPORT

M-I Drilling Fluids Co. Magcobar/IMCO A Dresser/Halliburton Company

P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 8

DATE 17 MAR 19 89 | DEPTH 1743 m

SPUD DATE 9-3-89 | PRESENT ACTIVITY ~~Drlg~~ P.O.O.H.

OPERATOR	CONTRACTOR	RIG NO.
MINORA RESOURCES NL	ATCO DRILLING	A2
REPORT FOR J. OZOLINS	REPORT FOR KEVIN MURPHY	SECTION, TOWNSHIP, RANGE YAMBUK

WELL NAME AND NO.	FIELD OR BLOCK NO.	COUNTY, PARISH OR OFFSHORE AREA	STATE/PROVINCE
WINDERMERE #2	PEP 111	OTWAY BASIN	VIC

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE 12 1/4"	TYPE REED S13G	JET SIZE 14,14,22	SURFACE 13 3/8 in. @ 313 m	HOLE F/LOGGERS 930	PITS 440	PUMP SIZE 6 X 8 1/2 IN. / 6 x 15		ANNULAR VEL (ft/min) DP DC
DRILL PIPE SIZE 4 1/2	TYPE 16.6	LENGTH	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 1370		PUMP MAKE, MODEL NAT 8-P-80 / NAT K500A	ASSUMED EFF 98 / 95 %	CIRCULATION PRESSURE (psi)
DRILL PIPE SIZE 4 1/2	TYPE HW	LENGTH	INTERMEDIATE in. @ ft.	IN STORAGE -	WEIGHT -	bbl/stk .0728 / .1502	stk/min	BOTTOMS UP (min) (strk)
DRILL COLLAR SIZE 8" / 6 1/2"		LENGTH	PRODUCTION OR LINER in. @ ft.	MUD TYPE KCl POLYMER		bbl/min	gal/min	TOTAL CIRC TIME (min) (strk)

MUD PROPERTIES

	☐ F.L. ☑ PIT	☐ F.L. ☐ PIT
Sample From		
Time Sample Taken	20:30	05:00
Flow Line Temperature (°F)	-	-
Depth (ft) (TVD / ft)	1743	1743
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.3+	9.3+
Funnel Viscosity (sec/qt) API @ °F	42	41
Plastic Viscosity cp @ °F	9	9
Yield Point (lb/100 ft²)	13	12
Gel Strength (lb/100 ft²) 10 sec/10 min	3 / 11	2 / 17
Filtrate API (cm³/30 min)	6.4	6.4
HTHP Filtrate (cm³/30 min) @ °F	-	-
Cake Thickness (32nd in. API/HTHP)	1 / 1	1 / 1
Solids Content (% by Vol) ☑ calculated ☐ retort	6.8	6.8
Liquid Content (% by Vol) Oil/Water	0 / 93.2	0 / 93.2
Sand Content (% by Vol)	TRACE	TRACE
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm³/cm³ mud	22.5	22.5
pH ☐ Strip ☑ Meter @ °F	9.3	9.3
Alkalinity Mud (P_m)	-	-
Alkalinity Filtrate (P_f/M_f)	.1 / 1.4	.1 / 1.4
Chloride (mg/L)	17,500	18,500
Total Hardness as Calcium (mg/L)	280	280
% KCl	1.8	2.0
% NaCl	0.5	0.4
NITRATE ppm	200	200

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
8.6-9.2	38-45	<8

RECOMMENDED TOUR TREATMENT

- REQUESTED BY MINORA TO BRING % KCl DOWN TO 2% TO HELP IN LOWERING M.W. WILL INCREASE TO 3% AGAIN AS DRILLING PROCEEDS

REMARKS

- DRILL 12 1/4" TO 1743 m
- PUMP KCl SLUG + POOH
- P/U KELLY + REAM TITE HOLE F/1561 m
- CONT P.O.O.H. TITE F/ 1561-1017 m

WATER ADDED - 90
MUD BUILT - 210
MUD DISPOSED - 248
SOLIDS CONTROL - 47
NEW HOLE VOL (LOGGERS) - 75

PRODUCT INVENTORY	KCl AG	CAUSTIC	POLYSAL	PAC
STARTING INVENTORY	260	54	114	147
RECEIVED				
USED LAST 24 hr	40	7	20	15
CLOSING INVENTORY	220	47	94	132
COST LAST 24 hr	710.00	202.16	857.60	1378.20
UNIT COST	17.75	28.88	42.88	91.88

SOLIDS EQUIPMENT

SHAKER #1	840 / 8100 mesh
SHAKER #2	840 / 8100 mesh
MUD CLEANER	- mesh
CENTRIFUGE	24 hours
DESANDER	24 hours
DESILTER	24 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		$ 3147-96	$ 13,977-08

DRILLING MUD REPORT

M-I Drilling Fluids Co. Magcobar/IMCO A Dresser/Halliburton Company

P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 9

DATE 18 MAR 19 89 | DEPTH 1748 m.

SPUD DATE 4-3-89 | PRESENT ACTIVITY RIH.

OPERATOR MINORA RESOURCES NL	CONTRACTOR ATCO DRILLING		RIG NO. A2
REPORT FOR J. OZOLINS	REPORT FOR K. MURPHY		SECTION, TOWNSHIP, RANGE YAMBUK
WELL NAME AND NO. WINDERMERE #2	FIELD OR BLOCK NO. PEP 111	COUNTY, PARISH OR OFFSHORE AREA OTWAY BASIN	STATE/PROVINCE VIC

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE $8\frac{1}{2}$"	TYPE REED HP-51-A	JET SIZE 11,12,12	SURFACE $13\frac{3}{8}$ in. @ 313 ft.	HOLE F/LOGGERS 931	PITS 490	PUMP SIZE 6 x 8½ IN. 6x 15		ANNULAR VEL (ft/min) DP DC
DRILL PIPE SIZE $4\frac{1}{2}$	TYPE 16.6.	LENGTH	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 1421		PUMP MAKE, MODEL NAT 8-P-80 NAT K500A	ASSUMED EFF 98 95 %	CIRCULATION PRESSURE (psi)
DRILL PIPE SIZE $4\frac{1}{2}$	TYPE HW	LENGTH	INTERMEDIATE in. @ ft.	IN STORAGE –	WEIGHT –	bbl/stk .0728 .1502	stk/min	BOTTOMS UP (min) (strk)
DRILL COLLAR SIZE 8" / $6\frac{1}{2}$"		LENGTH	PRODUCTION OR LINER in. @ ft.	MUD TYPE KCl POLYMER		bbl/min	gal/min	TOTAL CIRC TIME (min) (strk)

MUD PROPERTIES		
Sample From	☐ F.L. ☑ PIT	☐ F.L. ☐ PIT
Time Sample Taken	18:00	05:00
Flowline Temperature (°F)		–
Depth (ft) m (TVD / ft)	1748	1748
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.4	9.4+
Funnel Viscosity (sec/qt) API @ °F	40	39
Plastic Viscosity cp @ °F	9	9
Yield Point (lb/100 ft²)	12	12
Gel Strength (lb/100 ft²) 10 sec/10 min	2 16	2 17
Filtrate API (cm³/30 min)	6.6	6.8
HTHP Filtrate (cm³/30 min) @ °F	–	–
Cake Thickness (32nd in. API/HTHP)	1 1	1 1
Solids Content (% by Vol) ☑ calculated ☐ retort	6.9	7.3
Liquid Content (% by Vol) Oil/Water	0 / 93.1	0 / 93
Sand Content (% by Vol)	TRACE	TRACE
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm³/cm³ mud	20-22.5	25
pH ☐ Strip ☑ Meter @ °F	9.3	9.3
Alkalinity Mud (P_m)	–	–
Alk Filtrate (P_f/M_f)	.1 / 1.35	.1 / 1.35
Chloride (mg/L)	25,000	25,000
Total Hardness as Calcium (mg/L)	280	300
% KCl	3.2	3.2
% NaCl	–	–
NITRATE ppm	250	250

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
8.6 - 9.2	35 - 45	<8

RECOMMENDED TOUR TREATMENT

- REQUESTED TO BRING % KCl FROM 2% TO 3%.
- MUD WEIGHT STILL RISING THRU CLAYS DESPITE SLOW CORING RATE AND 170 BARREL H_2O DILUTI (VERY SLIGHT RISE IN MW FROM INCREASED KCl %)

REMARKS

- RIH w/ CORE BARREL
- WASH + REAM TITE HOLE F/1700 - 1743 m
- CUT CORE #1 (5.5m) TO 1748 m
- POOH w/ CORE #1 (78% REC)
- RIH w/ 8½" REED HP-51-A.

WATER ADDED - 30
MUD BUILT - 140
MUD DISPOSED - 78
SOLIDS CONTROL - 12
NEW HOLE VOL - 1
MUD LOST ON TRIP - 30

PRODUCT INVENTORY	KCl AG	CAUSTIC	PAC	NITRATE
STARTING INVENTORY	220	47	132	14
RECEIVED				
USED LAST 24 hr	60	5	13	1
CLOSING INVENTORY	160	42	119	13
COST LAST 24 hr	1065.00	144.40	1194.44	39.75
UNIT COST	17.75	28.88	91.88	39.75

SOLIDS EQUIPMENT

SHAKER #1 840 , 8100 mesh
SHAKER #2 840 , 8100 mesh
MUD CLEANER ___ mesh
CENTRIFUGE 24 hours
DESANDER 19 hours
DESILTER 19 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		$ 2443-59	$ 16,420-67

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO — A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 10
DATE 19 MAR 19 89 DEPTH 1788 m
SPUD DATE 9-3-89 PRESENT ACTIVITY CORING

OPERATOR	CONTRACTOR	RIG NO.
MINORA RESOURCES NL	ATCO DRILLING	A2
REPORT FOR: J. OZOLINS	REPORT FOR: K. MURPHY	SECTION, TOWNSHIP, RANGE: YAMBUK.
WELL NAME AND NO.: WINDERMERE #2	FIELD OR BLOCK NO.: PEP 111 / COUNTY, PARISH OR OFFSHORE AREA: OTWAY BASIN	STATE/PROVINCE: VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE 8 1/2	TYPE CHRIST RC476	JET SIZE —	SURFACE 13 3/8 in. @ 313 m	HOLE F/LOGGERS 890 / PITS 480	PUMP SIZE 6 X 8 1/2 IN.; 6 x 15 / ANNULAR VEL (ft/min) FOR 12 1/4; DP 49 DC 6 1/2" DC
DRILL PIPE SIZE 4 1/2	TYPE 16.6	LENGTH 1561	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 1340	PUMP MAKE, MODEL NAT 8-P-80, NAT K500A / ASSUMED EFF 98, 95 % / CIRCULATION PRESSURE (psi) 500
DRILL PIPE SIZE 4 1/2	TYPE HW	LENGTH 56	INTERMEDIATE in. @ ft.	IN STORAGE — / WEIGHT —	bbl/stk .0728, .1502 / stk/min 84, — / BOTTOMS UP (min) 134 (strk) 11254
DRILL COLLAR SIZE 6 1/2"	LENGTH 171		PRODUCTION OR LINER in. @ ft.	MUD TYPE KCl POLYMER	6.12 bbl/min / 257 gal/min / TOTAL CIRC TIME (min) 219 (strk) 18400

MUD PROPERTIES

	☐ F.L. ☑ PIT	☐ F.L. ☐ PIT
Sample From		
Time Sample Taken	15:00	05:00
Flo Temperature (°F)	—	—
Depth (ft) m (TVD / ft)	1777	1788
Weight ☑(ppg) ☐(lb/cu ft) ☐(sp gr)	9.4	9.3
Funnel Viscosity (sec/qt) API @ °F	41	43
Plastic Viscosity cp @ °F	9	8
Yield Point (lb/100 ft²)	13	15
Gel Strength (lb/100 ft²) 10 sec/10 min	2 16	3 17
Filtrate API (cm³/30 min)	6.4	6.8
HTHP Filtrate (cm³/30 min) @ °F	—	—
Cake Thickness (32nd in. API/HTHP)	1 /	1 /
Solids Content (% by Vol) ☑calculated ☐ retort	7.0	6.3
Liquid Content (% by Vol) Oil/Water	0 / 93	0 / 93.7
Sand Content (% by Vol)	TRACE	TRACE
Methylene Blue Capacity ☑lb/bbl equiv ☐ cm³/cm³ mud	20	17.5
pH ☐ Strip ☑Meter @ °F	9.7	9.4
Alkalinity Mud (P_m)	—	—
Alk Filtrate (P_f/M_f)	.15 / .45	.15 / .55
Chloride (mg/L)	24,000	21,000
Total Hardness as Calcium (mg/L)	240	120
% KCl	3.0	2.6
NITRATE ppm	250	250

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
8.6-9.2	38-45	<8

RECOMMENDED TOUR TREATMENT

- ANALYSIS SUMP H_2O: WT 8.4; pH 8.3; pf/Mf 0/. Ca^{++} 200 ppm; Cl^- 6500 ppm.
- BY MINORA REQUEST % KCl TO BE ALLOWED TO FALL TO 2.5%

REMARKS

- RIH w/ BIT #4 8 1/2" REED HP-51-A WITH 12, 12, 11 JETS.
- DRILL 8 1/2" TO 1777 m
- P.O.O.H TO CORE
- RIH w/ CORE HEAD. WASH + REAM F/1771-1777 m
- CORE F/1777-1788 m.

WATER ADDED - 20
MUD BUILT - 280
MUD DISPOSED - 341
SOLIDS CONTROL - 12
NEW HOLE VOL. - 8 (FROM LOGGERS LAG. LOST 40 B.

PRODUCT INVENTORY

PRODUCT INVENTORY	KCl	AG	CAUSTIC	PAC	##
STARTING INVENTORY	160	42	119		
RECEIVED					
USED LAST 24 hr	30	8	25		
CLOSING INVENTORY	130	4	94		
COST LAST	532.50	231.04	2297.00		
UNIT COST	17.75	28.88	91.88		

SOLIDS EQUIPMENT

SHAKER #1 B40, B100 mesh
SHAKER #2 B40, B100 mesh
MUD CLEANER — mesh
CENTRIFUGE 20 hours
DESANDER 24 hours
DESILTER 24 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		$3060.50	$19,481.21

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 11

DATE 20 MAR 19 89 DEPTH 1803 m
SPUD DATE 9-3-89 PRESENT ACTIVITY RIH w/ TEST TOOLS.

OPERATOR: MINORA RESOURCES NL	CONTRACTOR: ATCO DRILLING	RIG NO. A2
REPORT FOR: J. OZOLINS	REPORT FOR: K. MURPHY	SECTION, TOWNSHIP, RANGE: YAMBUK.
WELL NAME AND NO.: WINDERMERE #2	FIELD OR BLOCK NO.: PEP 111 / COUNTY, PARISH OR OFFSHORE AREA: OTWAY BASIN	STATE/PROVINCE: VIC

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA	
BIT SIZE	TYPE	JET SIZE	SURFACE 13 3/8 in. @ 313 ft.	HOLE 942	PITS 410	PUMP SIZE 6 x 8 1/2 IN. / 6 x 15	ANNULAR VEL (ft/min) DP DC
DRILL PIPE SIZE	TYPE	LENGTH	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME 1352		PUMP MAKE, MODEL NAT 8-P-80 / NAT K500A; ASSUMED EFF 98 / 95 %	CIRCULATION PRESSURE (psi)
DRILL PIPE SIZE	TYPE	LENGTH	INTERMEDIATE in. @ ft.	IN STORAGE —	WEIGHT —	bbl/stk .0728 / .1502; stk/min	BOTTOMS UP (min) (strk)
DRILL COLLAR SIZE		LENGTH	PRODUCTION OR LINER in. @ ft.	MUD TYPE KCl POLYMER		bbl/min gal/min	TOTAL CIRC TIME (min) (strk)

MUD PROPERTIES

Sample From	☐ F.L. ☑ PIT	☐ F.L. ☑ PIT
Time Sample Taken	22:00	00:30
Flo Temperature (°F)	—	—
Depth (m) (TVD / ft)	1803	1803
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.3	9.2+
Funnel Viscosity (sec/qt) API @ °F	41	42
Plastic Viscosity cp @ °F	10	10
Yield Point (lb/100 ft²)	15	15
Gel Strength (lb/100 ft²) 10 sec/10 min	2 / 6	2 / 7
Filtrate API (cm³/30 min)	6.8	6.6
HTHP Filtrate (cm³/30 min) @ °F	—	—
Cake Thickness (32nd in. API/HTHP)	1 /	1 /
Solids Content (% by Vol) ☑ calculated ☐ retort	6.4	6.0
Liquid Content (% by Vol) Oil/Water	0 / 93.6	0 / 94
Sand Content (% by Vol)	TRACE	TRACE
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm³/cm³ mud	17.5	17.5
pH ☐ Strip ☑ Meter @ °F	9.9	10.0
Alkalinity Mud (P_m)	—	—
Alk Filtrate (P_f/M_f)	.15 / 1.6	.2 / 1.65
Chloride (mg/L)	20000	20000
Total Hardness as Calcium (mg/L)	100	100
% KCl	2.5	2.5
NITRATE ppm	250	250

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
8.6 - 9.2	38 - 45	<8

RECOMMENDED TOUR TREATMENT

- DUE TO CENTRIFUGE TREATMENT WHILE TRIPPING PLUS SLIGHT H_2O FLOW THRU CENTRIFUGE, MW & VIS IN SUCTION PITS LOWERED TO 9.2 ppg & 40 SECS.

REMARKS

- CUT CORE #2 TO 1793 m
- POOH w/ CORE #2. (REC - 99.4%)
- RIH w/ BIT #4 RR 8 1/2"
- DRILL 8 1/2" TO 1803 m.
  CIRC SAMPLES @ 1797 & 1803 m
- PUMP KCl SLUG & POOH
- M/U TEST TOOLS & RIH.

WATER ADDED - 89
MUD BUILT - 0
MUD PUMPED - 95
SOLIDS CONTROL - 22
NEW HOLE VOLUME - 3

PRODUCT INVENTORY	CAUSTIC	PAC	KCl AG
STARTING INVENTORY	34	94	130
RECEIVED			
USED LAST 24 hr	1	11	30
CLOSING INVENTORY	33	83	100
COST LAST 24 hr			
UNIT COST	28.33	91.88	17.75

SOLIDS EQUIPMENT

SHAKER #1 B40 , B100 mesh
SHAKER #2 B40 , B100 mesh
MUD CLEANER mesh
CENTRIFUGE 24 hours
DESANDER 24 hours
DESILTER 24 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		$1572-06	$21,053-27

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO. 12

DATE 21 MAR 19 89 | DEPTH 1805 m
SPUD DATE 9-3-89 | PRESENT ACTIVITY DRILL 8½"

OPERATOR	CONTRACTOR	RIG NO.
MINORA RESOURCES NL	ATCO DRILLING	A2.
REPORT FOR: J. OZOLINS	REPORT FOR: K. MURPHY	SECTION, TOWNSHIP, RANGE: YAMBUK.

WELL NAME AND NO.	FIELD OR BLOCK NO.	COUNTY, PARISH OR OFFSHORE AREA	STATE/PROVINCE
WINDERMERE #2	PEP 111	OTWAY BASIN	VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE: 8½"	TYPE: REED HP-51A	JET SIZE: 3x11
DRILL PIPE SIZE: 4½	TYPE: 16.6	LENGTH: 1536
DRILL PIPE SIZE: 4½	TYPE: HW	LENGTH: 56
DRILL COLLAR SIZE: 6½		LENGTH: 213

CASING: SURFACE 13⅜ in. @ 313 ft. INTERMEDIATE in. @ ft. INTERMEDIATE in. @ ft. PRODUCTION OR LINER in. @ ft.

MUD VOLUME (BBL): HOLE 943; PITS 450; TOTAL CIRCULATING VOLUME 1393; IN STORAGE –; WEIGHT –; MUD TYPE KCl POLYMER.

CIRCULATION DATA: PUMP SIZE 6 x 8½ IN.; 6 x 15. PUMP MAKE, MODEL: NAT 8-P-80; NAT K500A. ASSUMED EFF 98; 95 %. bbl/stk ·0728, ·1502. stk/min 100, –. 7·28 bbl/min; 306 gal/min.

ANNULAR VEL (ft/min) 12¼" OH 8⅝" 12: DP 58, DC 249/6. CIRCULATION PRESSURE (psi) 1400. BOTTOMS UP (min) 122, (strk) 12,200. TOTAL CIRC TIME (min) 191, (strk) 19000.

MUD PROPERTIES

Sample From	☐ F.L. ☑ PIT	☐ F.L. ☑ PIT
Time Sample Taken	16:30	05:00
Flo Temperature (°F)		–
Depth (m) (TVD / ft)		1805
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.0	9.2
Funnel Viscosity (sec/qt) API @ °F	37	42
Plastic Viscosity cp @ °F		11
Yield Point (lb/100 ft²)	D	16
Gel Strength (lb/100 ft²) 10 sec/10 min	S /	2 / 15
Filtrate API (cm³/30 min)	T	6.8
API HTHP Filtrate (cm³/30 min) @ °F		–
Cake Thickness (32nd in. API/HTHP)	/	1 /
Solids Content (% by Vol) ☑ calculated ☐ retort		5.5
Liquid Content (% by Vol) Oil/Water	/	0 / 94.5
Sand Content (% by Vol)		TRACE
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm³/cm³ mud		17.5
pH ☐ Strip ☑ Meter @ °F		10.0
Alkalinity Mud (P_m)		–
Alk Filtrate (P_f/M_f)	/	·2 / 1·6
Chloride (mg/L)		22,000
Total Hardness as Calcium (mg/L)		80
% KCl		2.6
NITRATE ppm		250

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
8.6-9.2	38-45	< 8

RECOMMENDED TOUR TREATMENT

- TREATMENT OF SURFACE VOLUME GIVING UNBALANCED MUD.

REMARKS

- RUN DST #1. (H2O REC.)
- RIH w/ BIT #4 RR2 REED HP-51-A (3x11 JETS)
- WASH + REAM F/ 1789-1802 m
- DRILL 8½" F/1802-1805 m.

WATER ADDED - 51
MUD BUILT - 0
MUD DUMPED - 0
SOLIDS CONTROL - 10
NEW HOLE VOL - 1

PRODUCT INVENTORY

PRODUCT INVENTORY	PAC
STARTING INVENTORY	83
RECEIVED	
USED LAST 24 hr	2
CLOSING INVENTORY	81
COST LAST 24 hr	183.76
UNIT COST	91.88

SOLIDS EQUIPMENT

SHAKER #1 B40, B100 mesh
SHAKER #2 B40, B100 mesh
MUD CLEANER mesh
CENTRIFUGE 24 hours
DESANDER 24 hours
DESILTER 24 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		$ 183-76	$ 21,237-03

OPERATOR

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO.	13
DATE	22 MAR 1989
DEPTH	1869
SPUD DATE	9-3-89
PRESENT ACTIVITY	RUN LOGS.

OPERATOR	CONTRACTOR	RIG NO.
MINORA RESOURCES NL	ATCO DRILLING	A2
REPORT FOR: J. OZOLINS	REPORT FOR: K. MURPHY	SECTION, TOWNSHIP, RANGE: YAMBUK

WELL NAME AND NO.	FIELD OR BLOCK NO.	COUNTY, PARISH OR OFFSHORE AREA	STATE/PROVINCE
WINDERAMERE #1	PEP 111	OTWAY BASIN	~~Qld.~~ VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE / TYPE / JET SIZE	
DRILL PIPE SIZE / TYPE / LENGTH	
DRILL PIPE SIZE / TYPE / LENGTH	
DRILL COLLAR SIZE / LENGTH	
SURFACE CASING	13 3/8 in. @ 313 m
INTERMEDIATE	in. @ ft
INTERMEDIATE	in. @ ft
PRODUCTION OR LINER	in. @ ft
HOLE	W0/DS 1018
PITS	382
TOTAL CIRCULATING VOLUME	1400
IN STORAGE	–
WEIGHT	–
MUD TYPE	KCl POLYMER
PUMP SIZE	6 X 8½ IN.; 6 x 15
PUMP MAKE, MODEL	NAT 8-P-80; NAT K500A
ASSUMED EFF	98; 95 %
bbl/stk	.0728; .1502
stk/min	
bbl/min	
gal/min	
ANNULAR VEL (ft/min)	DP ___ DC ___
CIRCULATION PRESSURE (psi)	
BOTTOMS UP (min) (strk)	
TOTAL CIRC TIME (min) (strk)	

MUD PROPERTIES

Sample From	☐ F.L. ☑ PIT	☐ F.L. ☑ PIT
Time Sample Taken	17:00	05:00
Flow Line Temperature (°F)		–
Depth (ft) m (TVD / ft)	1869	1869
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.2	9.2
Funnel Viscosity (sec/qt) API @ °F	44	43
Plastic Viscosity cp @ °F	12	12
Yield Point (lb/100 ft²)	19	17
Gel Strength (lb/100 ft²) 10 sec/10 min	2 17	2 17
Filtrate API (cm³/30 min)	6.5	6.5
HTHP Filtrate (cm³/30 min) @ °F	–	–
Cake Thickness (32nd in. API/HTHP)	1 /	1 /
Solids Content (% by Vol) ☑ calculated ☐ retort	5.5	5.5
Liquid Content (% by Vol) Oil/Water	0 / 94.5	0 / 94.5
Sand Content (% by Vol)	TRACE	TRACE
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm³/cm³ mud	17.5	17.5
pH ☐ Strip ☑ Meter @ °F	9.7	9.7
Alkalinity Mud (P_m)	–	–
Alk Filtrate (P_f/M_f)	.15/1.50	.15/1.50
Chloride (mg/L)	22000	22000
Total Hardness as Calcium (mg/L)	100	100
% KCl	2.7	2.7
NITRATE ppm	200	200

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
8.6-9.2	38-45 YP 20	< 8

RECOMMENDED TOUR TREATMENT

REMARKS

- DRILL 8½" TO 1869
  CIRC SAMPLES @ 1839 + B.U. @ 1869 m
- PUMP KCl SLUG + POOH TO LOG
- RUN #1 DLL-MSFL-GR
  RUN #2 MEL-BCS-GR.

WATER ADDED - 31
MUD BUILT - 0
MUD DUMPED - 10
SOLIDS CONTROL - 14
NEW HOLE VOL - 13

PRODUCT INVENTORY

PRODUCT INVENTORY	CAUSTIC	PAC	KCl AG
STARTING INVENTORY	33	81	100
RECEIVED			
USED LAST 24 hr	1	9	30
CLOSING INVENTORY	32	72	70
COST LAST 24 hr	23.88	826.92	532.50
UNIT COST	23.88	91.88	17.75

SOLIDS EQUIPMENT

SHAKER #1 B40 / B100 mesh
SHAKER #2 B40 / B120 mesh
MUD CLEANER ___ mesh
CENTRIFUGE 24 hours
DESANDER 24 hours
DESILTER 24 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		$1338-30	$22,625-33

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO A Dresser/Halliburton Company
P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO.	14
DATE	23 MAR 1989
DEPTH	1816 m (12
SPUD DATE	9-3-89
PRESENT ACTIVITY	OPEN 8½" HOLE TO 12¼"
OPERATOR	MINORA RESOURCES NL
REPORT FOR	J. OZOLINS
CONTRACTOR	ATCO DRILLING
REPORT FOR	K. MURPHY
RIG NO.	A2
SECTION, TOWNSHIP, RANGE	YAMBUK.
WELL NAME AND NO.	WINDERMERE #2
FIELD OR BLOCK NO.	PEP 111
COUNTY, PARISH OR OFFSHORE AREA	OTWAY BASIN
STATE/PROVINCE	VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	12¼"
TYPE	REED HP 51G
JET SIZE	22,14,14
DRILL PIPE SIZE / TYPE / LENGTH	4½ / 16.6 / 1558
DRILL PIPE SIZE / TYPE / LENGTH	4½ / HW / 56.
DRILL COLLAR SIZE / LENGTH	6½ / 8" — 171 / 31
CASING SURFACE	13⅜ in. @ 313 m
INTERMEDIATE	in. @ ft.
INTERMEDIATE	in. @ ft.
PRODUCTION OR LINER	in. @ ft.
HOLE	963
PITS	480
TOTAL CIRCULATING VOLUME	1443
IN STORAGE	—
WEIGHT	—
MUD TYPE	KCl POLYMER
PUMP SIZE	6 x 8½ IN.; 5 x 15.
PUMP MAKE, MODEL	~~0728~~ 8-P-80; ~~1043~~ K500A
ASSUMED EFF %	98; 95
bbl/stk	~~8.736~~ .0728; ~~5.215~~ .1043
stk/min	120; 50
bbl/min	8.736 } 5.215 } 13.451
gal/min	586
ANNULAR VEL (ft/min)	6½ /
DP / DC	111 / 133 / 1(
CIRCULATION PRESSURE (psi)	2300
BOTTOMS UP (min) / (strk)	64 / 10,800
TOTAL CIRC TIME (min) / (strk)	103 / 17600

MUD PROPERTIES

Sample From	☐ F.L. ☑ PIT	☐ F.L. ☑ PIT
Time Sample Taken	22:30	05:00
Flow Temperature (°F)	-	-
Depth (ft) m (TVD) 12¼" HOLE ft	1764	1816
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.3	9.2
Funnel Viscosity (sec/qt) API @ °F	44	41
Plastic Viscosity cp @ °F	12	11
Yield Point (lb/100 ft²)	20	14
Gel Strength (lb/100 ft²) 10 sec/10 min	2 16	2 15
Filtrate API (cm³/30 min)	6.2	6.4
HTHP Filtrate (cm³/30 min) @ °F	-	-
Cake Thickness (32nd in. API/HTHP)	1 1	1 1
Solids Content (% by Vol) ☑ calculated ☐ retort	6.2	5.6
Liquid Content (% by Vol) Oil/Water	0 / 93.8	0 / 94.4
Sand Content (% by Vol)	TRACE	TRACE
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm³/cm³ mud	17.5-20	17.5
pH ☐ Strip ☑ Meter @ °F	8.8	8.8
Alkalinity Mud (P_m)	-	-
Alk Filtrate (P_f/M_f)	.05 / 1.45	.05 / 1.4
Chloride (mg/L)	24000	21000
Total Hardness as Calcium (mg/L)	180	180
% KCl	2.8	2.7
NITRATES	200	200

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
8.6-9.2	38-45	<8

RECOMMENDED TOUR TREATMENT

- CHANGE LINERS ON PUMP #2 F/6" TO 5".

REMARKS

- FINISH 'E' LOGS
- RUN P.I.T. TEST
- M/U 12¼" BHA + RIH
- WASH + REAM F/1063-1086 m. RIH TO 1140 m
- WASH + REAM F/1140-1172 m. RIH TO 1245 m
- WASH + REAM F/1245-1254 m. RIH TO 1731 m
- WASH + REAM F/1731-1744 m
- DRILL 12¼" F/1744-1816 m. (OPEN 8½" HOLE)

WATER ADDED - 54
MUD BUILT - 0
MUD DUMPED - 0
SOLIDS CONTROL - 11
NEW HOLE VOL - 18

PRODUCT INVENTORY

PRODUCT INVENTORY	CAUSTIC
STARTING INVENTORY	32
RECEIVED	
USED LAST 24 hr	2
CLOSING INVENTORY	30
COST LAST 24 hr	57.76
UNIT COST	28.88

SOLIDS EQUIPMENT

SHAKER #1	B20, B40 mesh
SHAKER #2	B40, B120 mesh
MUD CLEANER	mesh
CENTRIFUGE	24 hours
DESANDER	7 hours
DESILTER	7 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		$ 57-76	$ 22,683.09

DRILLING MUD REPORT

M-I Drilling Fluids Co.
Magcobar/IMCO A Dresser/Halliburton Company

P.O. BOX 42842 ■ HOUSTON, TEXAS 77242 USA

DRILLING MUD REPORT NO.	15
DATE	24 MAR 19 89
DEPTH	1869 m
SPUD DATE	9-3-89
PRESENT ACTIVITY	Run 9 5/8" CSG.

OPERATOR	MINORA RESOURCES NL	CONTRACTOR	ATCO DRILLING
REPORT FOR	J. OZOLINS	REPORT FOR	P. GALINAS
RIG NO.	A2	SECTION, TOWNSHIP, RANGE	YAMBUK.
WELL NAME AND NO.	WINDERMERE #2.	FIELD OR BLOCK NO.	PEP 111
COUNTY, PARISH OR OFFSHORE AREA	OTWAY BASIN	STATE/PROVINCE	VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE	TYPE	JET SIZE	SURFACE 13 3/8 in. @ 313 m	HOLE	PITS	PUMP SIZE 6 x 8 1/2 IN.; 5 x 15		ANNULAR VEL (ft/min) DP ___ DC ___
DRILL PIPE SIZE	TYPE	LENGTH	INTERMEDIATE in. @ ft.	TOTAL CIRCULATING VOLUME		PUMP MAKE, MODEL NAT 8-P-80; NAT K500A	ASSUMED EFF 98; 95 %	CIRCULATION PRESSURE (psi)
DRILL PIPE SIZE	TYPE	LENGTH	INTERMEDIATE in. @ ft.	IN STORAGE	WEIGHT	bbl/stk ·0728; ·1043	stk/min	BOTTOMS UP (min) (strk)
DRILL COLLAR SIZE		LENGTH	PRODUCTION OR LINER in. @ ft.	MUD TYPE KCl POLYMER		bbl/min	gal/min	TOTAL CIRC TIME (min) (strk)

MUD PROPERTIES

	☐ F.L. ☑ PIT	☐ F.L. ☐ PIT
Sample From		
Time Sample Taken	11:00	
Flow Temperature (°F)	-	
Depth (m) (TVD 12 1/4" HOLE ft)	1869	
Weight ☑ (ppg) ☐ (lb/cu ft) ☐ (sp gr)	9.3	
Funnel Viscosity (sec/qt) API @ °F	39	
Plastic Viscosity cp @ °F	13	
Yield Point ($lb/100 ft^2$)	12	
Gel Strength ($lb/100 ft^2$) 10 sec/10 min	2 / 5	/
Filtrate API (cm^3/30 min)	6.8	
HTHP Filtrate (cm^3/30 min) @ °F	-	
Cake Thickness (32nd in. API/HTHP)	1 /	/
Solids Content (% by Vol) ☑ calculated ☐ retort	6.3	
Liquid Content (% by Vol) Oil/Water	0 / 93.7	/
Sand Content (% by Vol)	TRACE	
Methylene Blue Capacity ☑ lb/bbl equiv ☐ cm^3/cm^3 mud	17.5	
pH ☐ Strip ☑ Meter @ °F	9.1	
Alkalinity Mud (P_m)	-	
Alk. Filtrate (P_f/M_f)	·1 / ·4	/
Chloride (mg/L)	21000	
Total Hardness as Calcium (mg/L)	140	
% KCl	2.7	
NITRATES	200	

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE

RECOMMENDED TOUR TREATMENT

- PUMPED SAND TRAP + SHAKER TANK
  TRANSFERRED MUD FROM SUCTION PIT #1 TO ACTIVE SYSTEM.
  CLEANED SUCTION PIT #1 & PILL TANK. PRIOR TO MIXING UP GEL/H_2O FOR CEMENTING.

REMARKS

- DRILL 12 1/4" TO 1869 m
- CIRC B.U.
- POOH TO RUN CASING
- LAY OUT 8" D.C.
- RUN 9 5/8" CASING.

PAC - MINUS 15 FROM ORIGINAL COUNT

PRODUCT INVENTORY

PRODUCT INVENTORY	CAUSTIC	KCl		MAGCO GEL	SODA ASH 40kg		POLY. SAL	LIME	PAC
STARTING INVENTORY	30	70		409	10		94	47	57
RECEIVED			DAMAGED				INVENTORY ADJUST		
USED LAST 24 hr	3	30		5	2		11	1	2
CLOSING INVENTORY	27	40		404	8		83	46	55
COST LAST 24 hr	86.64	532.50		93.00	38.80		471.68	8.38	183.76
UNIT COST	28.88	17.75		18.60	19.40		42.88	8.38	91.88

SOLIDS EQUIPMENT

SHAKER #1	B20, B40 mesh
SHAKER #2	B40, B120 mesh
MUD CLEANER	mesh
CENTRIFUGE	24 hours
DESANDER	12 hours
DESILTER	12 hours

M-I REPRESENTATIVE	PHONE	WAREHOUSE PHONE	DAILY COST	CUMULATIVE COST
JIM KELLEHER	07 3555 805		$1414-76	$24,097-85

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S.

Drilling Mud Report

REPORT No. 16	DATE 24th March 8[illegible]
RIG No. 2	SPUD DATE 9th Mar '[illegible]
DEPTH 1869 M.	TO

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM		
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS		
WELL NAME AND No.	WINDERMERE #2	FIELD OR BLOCK No.	PEP 111	LOCATION OTWAY BASIN	STATE VIC

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA	
BIT SIZE	TYPE	JET SIZE	13 3/8 SURFACE SET @ 313 M	HOLE 449	PITS	PUMP SIZE 6 x 8 1/2 IN. / 5 15	CIRCULATION PRESSURE (PSI)
DRILL PIPE SIZE	TYPE	LENGTH	INTERMEDIATE SET @ FT	TOTAL CIRCULATING VOL		PUMP MAKE, MODEL NAT 8P-80 / K500-A; ASSUMED EFF. 98/95%	BOTTOMS UP (MIN)
DRILL PIPE SIZE	TYPE	LENGTH	PRODUCTION OR LINER SET @ FT	IN STORAGE	WEIGHT —	BBL/STK / STK/MIN	TOTAL CIRC TIME (MIN)
DRILL COLLAR SIZE		LENGTH	MUD TYPE KCl POLYMER			BBL/MIN / GAL/MIN	ANNULAR VEL. (FT/MIN) D.C. / D.P.

MUD PROPERTIES

	FL / PIT	FL / ✓ PIT
SAMPLE FROM		✓ PIT
TIME SAMPLE TAKEN		10.30
FLOWLINE TEMPERATURE °C		
DEPTH (ft) Metres		1869
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G		9.5
FU VISCOSITY (sec./qt.) API @ °C		40
PL VISCOSITY cP @ °C		
YIELD POINT (lb/100ft²)		*
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	/	/
FILTRATE API (cm³/30 min.)		5.4
API HTHP FILTRATE (cm³/30 min.) @ °C		—
CAKE THICKNESS (32nd in. API/HTHP)	/	1 / —
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT (corrected for salt)		7.9
LIQUID CONTENT (% BY Vol.) OIL/WATER	/	— / 82.1
SAND CONTENT (% BY Vol.)		.5
METHYLENE BLUE CAPACITY ☐ lb/bbl equiv. ☐ cm³/cm³ mud		—
PH ☑ STRIP ☐ METER @ °C		9.0
ALKALINITY MUD (Pm)		—
ALKALINITY FILTRATE (P_f/M_f)	/	.1 / .3
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	/	— / —
CHLORIDE (mg/L)		22000
TOTAL HARDNESS AS CALCIUM (mg/L)		120
SULPHITE (mg/L)		
K⁺ (mg/L)		
KCL (% BY Vol.)		

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
PLASTIC VISCOSITY	YIELD POINT	

BY AUTHORITY: ☐ OPERATOR'S WRITTEN ☐ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

* Rheometer presently inoperational.

OPERATIONS SUMMARY

Run 9 5/8" Csg.
Circ.
Cement Csg.

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT
FLUID RECEIVED
WATER ADDED
FLUID DISPOSED
HOLE VOL. INCREASE

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge			Desilter	10×4"		Shaker No. 1	40/80	2
Degasser			Desander	4×6"		Shaker No. 2	40/80	2

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
Nil						

SOLIDS ANALYSIS	lb/bbl	%
Barite	—	—
Bentonite	10	1.1
Drill Solids	67	7.4
LGS	78	8.5
Salt	13	.1
N =		
K =		

BIT/HYD. PRESS. DATA	
Jet Velocity	
Impact Force	
HHP	
HSI	
Bit Press Loss	
CSG Seat Frac Press	
ECD @ CSG Seat	
ECD @ Bottom	

DAILY COST: $ —
CUMULATIVE COST: $24,097.85

I.D.F.S. ENGINEER: ANDRE SKUJINS — HOME ADDRESS: ADELAIDE — TELEPHONE: 08-795102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No. 17	DATE 25th March '8[illegible]
RIG No. 2	SPUD DATE 9/3
DEPTH 1869 M	TO

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS
WELL NAME AND No.	WINDERMERE #2	FIELD OR BLOCK No. PEP 111 / LOCATION OTWAY BASIN	STATE VIC

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA	
BIT SIZE 8½"	TYPE HP 43 A	JET SIZE 10-14-8	SURFACE 13⅜ SET @ 313 M	HOLE 394	PITS 390	PUMP SIZE 6 X 8½ IN. / 5 15	CIRCULATION PRESSURE (PSI) 1900
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 1596.24	INTERMEDIATE 9⅝ SET @ 1867 M	TOTAL CIRCULATING VOL. 784		PUMP MAKE, MODEL NAT - 8-P-80/K-500-A / ASSUMED EFF 98/95%	BOTTOMS UP (MIN) 46
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84	PRODUCTION OR LINER SET @ FT	IN STORAGE	WEIGHT	BBL/STK .0728/.0995 / STK/MIN 95	TOTAL CIRC. TIME (MIN) 115
DRILL COLLAR SIZE 6¼"		LENGTH 216.92	MUD TYPE KCl POLYMER			BBL/MIN ~~2.856~~ 8 / ~~285~~ GAL/MIN	ANNULAR VEL. (FT/MIN) D.C. 232 / D.P. 134

MUD PROPERTIES	FL / PIT	FL / PIT
SAMPLE FROM		
TIME SAMPLE TAKEN		06:30
FLOWLINE TEMPERATURE °C		46
DEPTH (M)		1869
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G		9.3
FUNNEL VISCOSITY (sec./qt.) API @ °C		35
PLASTIC VISCOSITY cP @ °C		8
YIELD POINT (lb/100ft²)		7
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	/	1 / 3
FILTRATE API (cm³/30 min.)		8.0
API HTHP FILTRATE (cm³/30 min.) @ °C		-
CAKE THICKNESS (32nd in. API/HTHP)	/	1 / -
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT		6.4
LIQUID CONTENT (% BY Vol.) OIL/WATER	/	- / 93.6
SAND CONTENT (% BY Vol.)		Tr
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud		-
PH ☑ STRIP ☐ METER @ °C		11.5
ALKALINITY MUD (Pm)		2.6
ALKALINITY FILTRATE (P_f/M_f)	/	.7 / 1.1
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	/	+
CHLORIDE (mg/L)		22000
TOTAL HARDNESS AS CALCIUM (mg/L)		100
SULPHITE (mg/L)		-
K^+ (mg/L)		
KCL (% BY Vol.)		2.8

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
PLASTIC VISCOSITY	YIELD POINT	

BY AUTHORITY: ☐ OPERATOR'S WRITTEN ☐ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Dumped Shaker Tank + Desander Tank due to Cement Contamination.
Ran Surface mud through Solids Control Equipment.
Treat Mud w/ Bicarb Soda while drilling out.
Changed 2 shaker screens from 80/40 to B85/S100.

OPERATIONS SUMMARY

Nipple up BOPs.
Pressure Test.
M/U Bit & BHA.
Tag Cement @ 1832m.
Drill out Cement, Plug, & Stage Collar.

MUD ACCOUNTING (BBLS.) SUMMARY

FLUID BUILT	-
FLUID RECEIVED	-
WATER ADDED	-
FLUID DISPOSED	145 Dumped Shaker + Desander Tank.
HOLE VOL. INCREASE	

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		6	Desilter	10×4"	6	Shaker No. 1	80/S80	+1
Degasser			Desander	4×6"	6	Shaker No. 2	40/B40	+[illegible]

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
MAGCOGEL	404	*	52	352		
~~[illegible]~~						

* USED ON 9⅝" Cement Job

SOLIDS ANALYSIS	lb/bbl	%
Barite	-	-
Bentonite	9	1.0
Drill Solids	54	6.0
LGS	64	7.0
Salt	13	.1
N =		
K =		

BIT/HYD. PRESS. DATA	
Jet Velocity	401
Impact Force	550
HHP	224
HSI	3.93
Bit Press Loss	1350
CSG Seat Frac Press	
ECD @ CSG Seat	
ECD @ Bottom	

DAILY COST $ -

CUMULATIVE COST $24,097.85

I.D.F.S. ENGINEER: ANDRE SKUJINS | HOME ADDRESS: ADELAIDE | TELEPHONE: 08 - 295 [illegible]

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No.	18	DATE	26TH MAR '8
RIG No.	2	SPUD DATE	9/3
DEPTH	1869M	TO	

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS
WELL NAME AND No.	WINDERMERE	FIELD OR BLOCK No.	PEP 111
LOCATION	OTWAY BASIN	STATE	VIC

DRILLING ASSEMBLY

BIT SIZE 8½"	TYPE HP 43 A	JET SIZE 10.14.B
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 1596.24
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84
DRILL COLLAR SIZE 6¼"		LENGTH 216.92

CASING

SURFACE	13⅜ SET @ 313 M
INTERMEDIATE	9⅝ SET @ 1867 M
PRODUCTION OR LINER	SET @ — FT
MUD TYPE	KCl POLYMER

MUD VOLUME (BBL)

HOLE	394
PITS	390
TOTAL CIRCULATING VOL.	784
IN STORAGE	—
WEIGHT	

CIRCULATION DATA

PUMP SIZE	6 X 8½ IN. / 5 15	CIRCULATION PRESSURE (PSI)	1900
PUMP MAKE, MODEL	NAT - 8-P-80 / K-500-A	BOTTOMS UP (MIN)	46
ASSUMED EFF	98/95%	TOTAL CIRC. TIME (MIN)	15
BBL/STK	.0728/.0995	ANNULAR VEL. (FT/MIN)	
STK/MIN	95	DC	232
BBL/MIN	6.8	DP	134
GAL/MIN	285		

MUD PROPERTIES 27/3

	FL / PIT	FL / PIT
SAMPLE FROM		
TIME SAMPLE TAKEN		05.00
FLOWLINE TEMPERATURE °C		47
DEPTH M		1886
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G		9.2
FUNNEL VISCOSITY (sec./qt.) API @ °C		34
PLASTIC VISCOSITY cP @ °C		7
YIELD POINT (lb/100ft²)		6
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	/	1 / 3
FILTRATE API (cm³/30 min.)		7.4
API HTHP FILTRATE (cm³/30 min.) @ °C		—
CAKE THICKNESS (32nd in. API/HTHP)	/	1 / -
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT (Corrected for Salt)		5.6
LIQUID CONTENT (% BY Vol.) OIL/WATER	/	- / 94.4
SAND CONTENT (% BY Vol.)		Tr
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud		15.0
PH ☑ STRIP ☐ METER @ °C		10.5
ALKALINITY MUD (Pm)		1.8
ALKALINITY FILTRATE (P_f/M_f)	/	.4 / .9
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	/	/
CHLORIDE (mg/L)		22,000
TOTAL HARDNESS AS CALCIUM (mg/L)		80
SULPHITE (mg/L)		—
K^+ (mg/L)		14,700
KCL (% BY Vol.)		2.8
Nitrate (mg/lt)		180

MUD PROPERTY SPECIFICATIONS

WEIGHT 9.0 - 9.3	VISCOSITY	FILTRATE 8-10
PLASTIC VISCOSITY	YIELD POINT	PH 9.5-10.0

BY AUTHORITY: ☑ OPERATOR'S WRITTEN ☑ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Maintain adequate Yield Point to enable reasonable hole cleaning.
Will add Sodium Sulphite for corrosion control.
For improved hole cleaning, will mix Gel in Premix tank and bleed in as necessary.

OPERATIONS SUMMARY

Drill out Stage Collar.
RIH.
Drill out Cement + Float Collar.
Pressure Test. Work on BOPs.
POH. Work on BOPs.
RIH. Pressure Test.
RIH. Pressure Test.

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT	
FLUID RECEIVED	
WATER ADDED	
FLUID DISPOSED	Negligible through Solids Control.
HOLE VOL. INCREASE	

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		20	Desilter	10x4"	20	Shaker No. 1	200/200	
Degasser			Desander	4x6"	20	Shaker No. 2	200/200	

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
BICARB SODA	22		6		20.40	122.40

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	—
Bentonite	10	1.1
Drill Solids	47	5.2
LGS	57	6.3
Salt	13	.1
N =	.62	
K =	.27	

BIT/HYD. PRESS. DATA

Jet Velocity	451
Impact Force	544
HHP	221
HSI	3.89
Bit Press Loss	1330
CSG Seat Frac Press	400
EMW CSG Seat	12.6
ECD @ Bottom	

DAILY COST $122.40

CUMULATIVE COST $24,220.25

I.D.F.S. ENGINEER	ANDRE SKUJINS	HOME ADDRESS	ADELAIDE	TELEPHONE	08-295102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No. 19	DATE 27th Mar 8[illegible]
RIG No. 2	SPUD DATE 9/3
DEPTH 1869 m	TO 2008 m

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS
WELL NAME AND No.	WINDERMERE # 2	FIELD OR BLOCK No. PEP 111	LOCATION OTWAY BASIN / STATE VIC.

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	8½"
TYPE	HP43A
JET SIZE	11.14.B
DRILL PIPE SIZE / TYPE / LENGTH	4½" / 16.6 / 1735.24
DRILL PIPE SIZE / TYPE / LENGTH	4½" / HW / 55.84
DRILL COLLAR SIZE / LENGTH	6½" / 216.92
CASING SURFACE	13⅜" SET @ 313 M
CASING INTERMEDIATE	9⅝" SET @ 1867 M
PRODUCTION OR LINER	SET @ — FT.
MUD TYPE	KCl POLYMER
HOLE	430
PITS	288
TOTAL CIRCULATING VOL.	718
IN STORAGE	—
WEIGHT	
PUMP SIZE	6 x 8½ IN. / 5 x 15
PUMP MAKE, MODEL	Nat. 8-P-80 / K-500-A
ASSUMED EFF	95%
BBL/STK	.0728 / .0995
STK/MIN	96 / —
BBL/MIN	7.0
GAL/MIN	294
CIRCULATION PRESSURE (PSI)	1825
BOTTOMS UP (MIN)	49
TOTAL CIRC. TIME (MIN)	100
ANNULAR VEL. (FT/MIN) D.C.	240
D.P.	138

MUD PROPERTIES

	283	
SAMPLE FROM	PIT	PIT
TIME SAMPLE TAKEN	16.00	05.00
FLOWLINE TEMPERATURE °C	48	49
DEPTH M	1949	2036
WEIGHT (ppg)	9.3	9.4
FUNNEL VISCOSITY (sec./qt.) API @ °C	32	32
PLASTIC VISCOSITY cP @ °C	5	5
YIELD POINT (lb/100ft²)	3	3
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	1 / 2	1 / 2
FILTRATE API (cm³/30 min.)	9.3	10.2
API HTHP FILTRATE (cm³/30 min.) @ °C	—	—
CAKE THICKNESS (32nd in. API/HTHP)	1 / —	1 / —
SOLIDS CONTENT (% BY Vol.) CALCD. (Corrected for Salt)	6.5	7.3
LIQUID CONTENT (% BY Vol.) OIL/WATER	— / 93.5	— / 92.7
SAND CONTENT (% BY Vol.)	Tr	Tr
METHYLENE BLUE CAPACITY lb/bbl equiv.	17½	20
PH STRIP	10.5	10.0
ALKALINITY MUD (Pm)	1.6	1.3
ALKALINITY FILTRATE (P_f/M_f)	.4 / .7	.2 / .5
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	/	/
CHLORIDE (mg/L)	20500	19000
TOTAL HARDNESS AS CALCIUM (mg/L)	200	360
SULPHITE (mg/L)	80	80
K^+ (mg/L)	13,500	12,500
KCL (% BY Vol.)	2.6	2.4
Nitrate (mg/L)	150	150

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
9.0–9.3		8–10
PLASTIC VISCOSITY	YIELD POINT	pH 9.5–10.0

BY AUTHORITY: ✓ OPERATOR'S WRITTEN ✓ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Adding Sulphite for Corrosion Control (Approx 100 mg/l)
Adding Nitrate as Tracer – Approx 200 mg/l
Maintain Rheological properties to maintain adequate hole cleaning.

OPERATIONS SUMMARY

Drill out Cement & Shoe.
Drill 8½" hole to 1872 m.
Conduct Leak off Test.
Drill Ahead w/ Surveys.

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT	—
FLUID RECEIVED	—
WATER ADDED	—
FLUID DISPOSED	51 + 15 Solids Control + Dumped Sand Trap
HOLE VOL. INCREASE	36

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		24	Desilter	10x4"	24	Shaker No. 1	80/80	24
Degasser			Desander	4x6"	24	Shaker No. 2	40/40	14

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander	9.3	12.4+	.5
Desilter	9.3	10.7	1.0

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
Sod. Nitrate	13		2	11	39.75	79.50
Sod. Sulphite	6		2	4	29.75	59.50
						139.00

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	—
Bentonite	14	1.5
Drill Solids	57	6.3
LGS	71	7.9
Salt	11	.1
N =	.7	
K =	.1	

BIT/HYD. PRESS. DATA

Jet Velocity	444
Impact Force	592
HHP	248
HSI	4.36
Bit Press Loss	1450
CSG Seat Frac Press	1100
EMW @ CSG Seat	12.6+ ppg
ECD @ Bottom	

DAILY COST $139.00 | CUMULATIVE COST $24,359.25

I.D.F.S. ENGINEER: ANDRE SKUJINS | HOME ADDRESS: ADELAIDE | TELEPHONE: 08-795 102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No. 20	DATE 28th MAR '80
RIG No. 2	SPUD DATE 9/3
DEPTH 2008M	TO 2172

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS
WELL NAME AND No.	WINDERMERE #2	FIELD OR BLOCK No.	PEP 111
LOCATION	OTWAY BASIN	STATE	VIC.

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE 8½"	TYPE HP43 A	JET SIZE 11.14.13
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 1899.24
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84
DRILL COLLAR SIZE 6½"		LENGTH 216.92

- CASING: 13⅜ SURFACE SET @ 313 M; 9⅝ INTERMEDIATE SET @ 1867 M; PRODUCTION OR LINER SET @ — FT
- MUD TYPE: KCl POLYMER – WATER
- MUD VOLUME: HOLE 480; PITS –; TOTAL CIRCULATING VOL –; IN STORAGE 520; WEIGHT
- PUMP SIZE 6 x 8½ / 5 x 15 IN.
- PUMP MAKE, MODEL NAT: 8-P-80 / K-500-A; ASSUMED EFF. 98/95 %
- BBL/STK .0728/.0995; STK/MIN 96
- BBL/MIN 7.0; 294 GAL/MIN
- CIRCULATION PRESSURE (PSI) 1750
- BOTTOMS UP (MIN) 57
- TOTAL CIRC. TIME (MIN)
- ANNULAR VEL (FT/MIN): DC 240; DP 138

MUD PROPERTIES

	FL / PIT	FL / PIT
SAMPLE FROM		
TIME SAMPLE TAKEN	MUD IN	04-30
FLOWLINE TEMPERATURE °C	PITS	31
DEPTH (ft)	–	2115
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G	9.3	8.4+
FUNNEL VISCOSITY (sec./qt.) API @ °C	33	
PLASTIC VISCOSITY cP @ °C	6	
YIELD POINT (lb/100ft²)	4	
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	1/2	/
FILTRATE API (cm³/30 min.)	11.2	
API HTHP FILTRATE (cm³/30 min.) @ °C	–	
CAKE THICKNESS (32nd in. API/HTHP)	1/–	/
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	6.6	
LIQUID CONTENT (% BY Vol.) OIL/WATER	–/93.4	/
SAND CONTENT (% BY Vol.)	Tr	
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	20	
PH ☑ STRIP ☐ METER @ °C	9.5	8.5
ALKALINITY MUD (Pm)	–	–
ALKALINITY FILTRATE (P_f/M_f)	.2/.5	Tr/.5
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	+	+
CHLORIDE (mg/L)	17500	9000
TOTAL HARDNESS AS CALCIUM (mg/L)	460	460
SULPHITE (mg/L)	60	–
K^+ (mg/L)	11500	4500
KCL (% BY Vol.)	2.2	.8
NITRATE (mg/L)	100	100+

MUD PROPERTY SPECIFICATIONS

WEIGHT | VISCOSITY | FILTRATE | PLASTIC VISCOSITY | YIELD POINT

BY AUTHORITY: ☐ OPERATOR'S WRITTEN ☐ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Displaced hole with Water at 2079m. Transferred mud to Pits until full. Had to dump 196 bbls.

Hole approx 20 bbls over Gauge at displacement time.

Circulating water through Sump.

OPERATIONS SUMMARY

Drill Ahead.

Displace Hole w/ Water at 2079 M.

No fill, drag, etc while drilling w/ Water.

MUD ACCOUNTING (BBLS.) — SUMMARY

- FLUID BUILT
- FLUID RECEIVED
- WATER ADDED
- FLUID DISPOSED: 196 + 30 — Dumped in Sump & Solids Control.
- HOLE VOL. INCREASE: 50 bbls — Includes the 20 bbls over Gauge.

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		24	Desilter	10x4"	14	Shaker No. 1	80/100	23
Degasser			Desander	4x6"	14	Shaker No. 2	40/60	4

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
SOD. NITRATE	11		1	10	39.75	39.75
SOD. SULPHITE (50kg)	4		1	3	29.75	29.75
						69.50

SOLIDS ANALYSIS

	lb/bbl	%
Barite	Mud in	Pits
Bentonite	14	1.6
Drill Solids	50	5.5
LGS	65	7.1
Salt	10	.1
N =		
K =		

BIT/HYD. PRESS. DATA

Jet Velocity	444
Impact Force	532
HHP	223
HSI	3.92
Bit Press Loss	1300
CSG Seat Frac Press	1100
ECD @ CSG Seat	12.6+
ECD @ Bottom	

DAILY COST $69.50 | CUMULATIVE COST $24,428.75

I.D.F.S. ENGINEER ANDRE SKUJINS | HOME ADDRESS ADELAIDE | TELEPHONE 08-295 102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No.	21	DATE	29TH MAR 8
RIG No.	2	SPUD DATE	9/3
DEPTH	2172M	TO	2272M

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATW APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS
WELL NAME AND No.	WINDERMERE # 2	FIELD OR BLOCK No.	PEP 111
LOCATION	OTWAY BASIN	STATE	VIC

DRILLING ASSEMBLY

BIT SIZE 8½"	TYPE L4 PP13	JET SIZE 6x9
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 2084.25
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84
DRILL COLLAR SIZE 6¾"		LENGTH 131.91

CASING

- 13⅜" SURFACE SET @ 313 M
- 9⅝" INTERMEDIATE SET @ 1867 M
- PRODUCTION OR LINER SET @ — FT
- MUD TYPE: WATER

MUD VOLUME (BBL)

HOLE	PITS
505	

- TOTAL CIRCULATING VOL:
- IN STORAGE: 505
- WEIGHT:

CIRCULATION DATA

PUMP SIZE	6 x 8½ IN. / 5 15
PUMP MAKE, MODEL	NAT = 8-P-80 / K-500-A
ASSUMED EFF	96 / 95%
BBL/STK	.0713 / .0495
STK/MIN	105
BBL/MIN	7.5
GAL/MIN	315
CIRCULATION PRESSURE (PSI)	1125
BOTTOMS UP (MIN)	54
TOTAL CIRC TIME (MIN)	
ANNULAR VEL (FT/MIN) D.C	257
D.P.	148

MUD PROPERTIES

	FL / PIT	FL / PIT
SAMPLE FROM	MUD	
TIME SAMPLE TAKEN		04-30
FLOWLINE TEMPERATURE °C	IN	31
DEPTH (M)	PITS	2301
WEIGHT (ppg) (lb/cu.ft) Sp. G	9.2+	8.4+
FUNNEL VISCOSITY (sec/qt) API @ °C	33	
PLASTIC VISCOSITY cP @ °C	7	
YIELD POINT (lb/100ft²)	4	
GEL STRENGTH (lb/100ft²) 10 sec/10 min.	1 / 1	/
FILTRATE API (cm³/30 min.)	12.0	
API HTHP FILTRATE (cm³/30 min.) @ °C	–	
CAKE THICKNESS (32nd in. API/HTHP)	1 / –	/
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	6.3	
LIQUID CONTENT (% BY Vol.) OIL/WATER	– / 93.7	/
SAND CONTENT (% BY Vol.)	Tr	
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	17.5	
PH ☑ STRIP ☐ METER @ °C	9.0	7.5
ALKALINITY MUD (Pm)	–	–
ALKALINITY FILTRATE (P_f/M_f)	Tr / .3	0 / .2
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	+	+
CHLORIDE (mg/L)	15500	9000
TOTAL HARDNESS AS CALCIUM (mg/L)	440	520
SULPHITE (mg/L)	40	–
K^+ (mg/L)	10000	4500
KCL (% BY Vol.)	1.9	.8
N⁺ RATE (mg/L)	100	100

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
WATER		
PLASTIC VISCOSITY	YIELD POINT	

BY AUTHORITY: ☐ OPERATOR'S WRITTEN ☐ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Circulated "High Vis Pill" two connections prior to survey. (Used 1 PAC)

Continuing to use Sump as settling area successfully.

No Solids build up at all in Water.

OPERATIONS SUMMARY

Drill to 2261m.
Trip Bit. No drag.
Respool blocks from 8 to 10 lines.
RIH w/ PDC Bit.
Wash 14m to btm. 4metres fill.
Drill Ahead.

MUD ACCOUNTING (BBLS.) SUMMARY

- FLUID BUILT
- FLUID RECEIVED
- WATER ADDED
- FLUID DISPOSED
- HOLE VOL. INCREASE: 25

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr
Centrifuge		10	Desilter	10x4"	0	Shaker No. 1	80/100	4
Degasser			Desander	4x8"	0	Shaker No. 2	40/100	1C

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
PAC	55		1	54	91.88	91.88

SOLIDS ANALYSIS

	lb/bbl	%
Barite	MUD	IN PITS
Bentonite	12	1.3
Drill Solids	49	5.5
LGS	62	6.8
Salt	9	.1
N =		
K =		

BIT/HYD. PRESS. DATA

Jet Velocity	270
Impact Force	409
HHP	112
HSI	1.97
Bit Press Loss	610
CSG Seat Frac Press	1100
ECD @ CSG Seat	12.64
ECD @ Bottom	

DAILY COST: $91.88

CUMULATIVE COST: $24,520.63

I.D.F.S. ENGINEER	HOME ADDRESS	TELEPHONE
ANDRE SKUJINS	ADELAIDE	08-795102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No. 22		DATE 30th MAR 8	
RIG No. 2		SPUD DATE 9/3	
DEPTH 2272m	TO 2385		

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATW APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS
WELL NAME AND No.	WINDERMERE 2	FIELD OR BLOCK No. PEP 111	LOCATION OTWAY BASIN / STATE VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	8½"
TYPE	V837
JET SIZE	10-14, 13
DRILL PIPE SIZE	4½"
TYPE	16.6
LENGTH	2112.24
DRILL PIPE SIZE	4½"
TYPE	HW
LENGTH	55.84
DRILL COLLAR SIZE	6¾"
LENGTH	216.42
SURFACE SET @	13⅜ 313 m
INTERMEDIATE SET @	9⅝ 1867 m
PRODUCTION OR LINER SET @	FT.
MUD TYPE	WATER
HOLE	520
PITS	
TOTAL CIRCULATING VOL	
IN STORAGE	470
WEIGHT	
PUMP SIZE	6 x 8½ IN. / 5 x 15
PUMP MAKE, MODEL	NAT: 8-P-80 / K-500-A
ASSUMED	96/95 %
BBL/STK	.0713 / .0995
STK/MIN	100
BBL/MIN	7.1
GAL/MIN	300
CIRCULATION PRESSURE (PSI)	1800
BOTTOMS UP (MIN)	58
TOTAL CIRC TIME (MIN)	
ANNULAR VEL. (FT/MIN) DC	245
DP	141

MUD PROPERTIES 31/3

	FL / PIT	FL / PIT
SAMPLE FROM		
TIME SAMPLE TAKEN	MUD	03-00
FLOWLINE TEMPERATURE °C	IN	31
DEPTH (M)	PITS	2403
WEIGHT (ppg) (lb/cu.ft) Sp. G	9.2+	8.4+
FUNNEL VISCOSITY (sec./qt.) API @ °C	34	
PLASTIC VISCOSITY cP @ °C	7	
YIELD POINT (lb/100ft²)	3	
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	1/1	/
FILTRATE API (cm³/30 min.)	13.0	
API HTHP FILTRATE (cm³/30 min.) @ °C	–	
CAKE THICKNESS (32nd in. API/HTHP)	1/–	/
SOLIDS CONTENT (% BY Vol.) CALCD. RETORT	6.3	
LIQUID CONTENT (% BY Vol.) OIL/WATER	–/93.7	/
SAND CONTENT (% BY Vol.)	0	
METHYLENE BLUE CAPACITY lb/bbl equiv. cm³/cm³ mud	15+	
PH STRIP METER @ °C	9.0	7.5
ALKALINITY MUD (Pm)	–	–
ALKALINITY FILTRATE (P_f/M_f)	Tr/.3	0/.2
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	/	/
CHLORIDE (mg/L)	15500	8500
TOTAL HARDNESS AS CALCIUM (mg/L)	440	560
SULPHITE (mg/L)	40	–
K^+ (mg/L)	10000	4500
KCL (% BY Vol.)	1.9	.8
N[illegible] RATE (mg/L)	100	100–

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY WATER	FILTRATE
PLASTIC VISCOSITY	YIELD POINT	

BY AUTHORITY: OPERATOR'S WRITTEN / ✓ OPERATOR'S REPRESENTATIVE / DRILLING CONTRACTOR / OTHER

RECOMMENDATIONS

Continue using Sump Water as Drilling Fluid

OPERATIONS SUMMARY

Drill to 2317
Trip Bit – No hole problems
RIH w/ New Bit
Drill to 2385

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT	
FLUID RECEIVED	
WATER ADDED	
FLUID DISPOSED	
HOLE VOL. INCREASE	15

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr
Centrifuge		0	Desilter	10x4"	0	Shaker No. 1	[illegible]	16
Degasser			Desander	[illegible]	0	Shaker No. 2	[illegible]	0

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
NIL						

SOLIDS ANALYSIS

	lb/bbl	%
Barite	MUD IN PITS	
Bentonite	9	1.0
Drill Solids	52	5.3
LGS	62	6.8
Salt	9	.1
N =		
K =		

BIT/HYD. PRESS. DATA

Jet Velocity	422
Impact Force	606
HHP	259
HSI	4.6
Bit Press Loss	1480
CSG Seat Frac Press	1100
ECD @ CSG Seat	12.6+
ECD @ Bottom	

DAILY COST $ –

CUMULATIVE COST $24,520.63

I.D.F.S. ENGINEER	ANDRE SKUJINS	HOME ADDRESS	ADELAIDE	TELEPHONE	08-795102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No.	23	DATE	31st March '8[illegible]
RIG No.	2	SPUD DATE	9/3
DEPTH	2385m	TO	2482m

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS
WELL NAME AND No.	WINDERMERE # 2	FIELD OR BLOCK No. PEP 111 / LOCATION OTWAY BASIN	STATE VIC

DRILLING ASSEMBLY

BIT SIZE 8½"	TYPE S-31-C	JET SIZE 10 14-B
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 2209.24
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84
DRILL COLLAR SIZE 6½"		LENGTH 216.92

CASING

- 13⅜ SURFACE SET @ 313 M
- 9⅝ INTERMEDIATE SET @ 1867 M
- PRODUCTION OR LINER SET @ — FT.

MUD VOLUME (BBL)

- HOLE 540
- PITS 150
- TOTAL CIRCULATING VOL 690
- IN STORAGE 400
- WEIGHT 9.2+
- MUD TYPE WATER

CIRCULATION DATA

- PUMP SIZE 6 x 8½ IN. / 5 x 15
- PUMP MAKE, MODEL NAT: 8-P-80 / K-500-A
- ASSUMED EFF 96/95%
- BBL/STK .0713/.0945
- STK/MIN 105
- BBL/MIN 7.5
- GAL/MIN 315
- CIRCULATION PRESSURE (PSI) 2075
- BOTTOMS UP (MIN) 58
- TOTAL CIRC. TIME (MIN) 92
- ANNULAR VEL. (FT/MIN) DC 257, DP 148

MUD PROPERTIES 1/4

SAMPLE FROM	☐ FL ☑ PIT	FL ☑ PIT
TIME SAMPLE TAKEN	MUD	05-15
FLOWLINE TEMPERATURE °C	IN	42
DEPTH (M)	PITS	2517
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G	9.2+	8.4*
FUNNEL VISCOSITY (sec./qt.) API @ °C	33	
PLASTIC VISCOSITY cP @ °C	6	
YIELD POINT (lb/100ft²)	3	
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	1 / 1	/
FILTRATE API (cm³/30 min.)	13.8	
API HTHP FILTRATE (cm³/30 min.) @ °C	—	
CAKE THICKNESS (32nd in. API/HTHP)	1 / —	/
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	6.3	
LIQUID CONTENT (% BY Vol.) OIL/WATER	93.7	/
SAND CONTENT (% BY Vol.)	0	
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	15	
pH ☑ STRIP ☐ METER @ °C	9.0	7.5
ALKALINITY MUD (Pm)	—	—
ALKALINITY FILTRATE (P_f/M_f)	Tr / .3	0 / .3
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	/	/
CHLORIDE (mg/L)	15000	9000
TOTAL HARDNESS AS CALCIUM (mg/L)	460	680
SULPHITE (mg/L)	20	—
K^+ (mg/L)	9500	4000
KCL (% BY Vol.)	1.8	.7
N E (mg/L)	100	50

MUD PROPERTY SPECIFICATIONS

WEIGHT / VISCOSITY / FILTRATE: WATER

PLASTIC VISCOSITY / YIELD POINT

BY AUTHORITY: ☐ OPERATOR'S WRITTEN ☑ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Water Drilling system "Closed" – Circulating down trough into Pill tank, skimming into Suction Tank.
⇒ Suction Tank has variable Volume which can be monitored for Kick control.
When Weight of Water increases to approx 8.6 – 8.7 ppg, dump entire system and replace w/ fresh water from Sump. (Occurred at 17.30 hrs, 31/3 and 02.00 (1/4))

OPERATIONS SUMMARY

Drill to 2403m
Check Pump for Pressure Losses.
Trip Bit Wet to check for washout.
(Washed Jet)
RIH w/ New Bit
Drill Ahead.

MUD ACCOUNTING (BBLS.) — SUMMARY

- FLUID BUILT
- FLUID RECEIVED
- WATER ADDED
- FLUID DISPOSED
- HOLE VOL. INCREASE 20

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		0	Desilter	10x4"	0	Shaker No. 1	80/B[illegible]	0
Degasser			Desander	4x6"	0	Shaker No. 2	40/100	17

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
NIL						

SOLIDS ANALYSIS

	lb/bbl	%
Barite	MUD	IN PIT
Bentonite	9	1.0
Drill Solids	52	5.8
LGS	62	6.8
Salt	9	.1
N =		
K =		

BIT/HYD. PRESS. DATA

Jet Velocity	443
Impact Force	607
HHP	278
HSI	4.8
Bit Press Loss	1500
CSG Seat Frac Press	1100 psi
ECD @ CSG Seat	12.6+
ECD @ Bottom	

DAILY COST $—

CUMULATIVE COST $24,520.63

I.D.F.S. ENGINEER: ANDRE SKUJINS — HOME ADDRESS: ADELAIDE — TELEPHONE: 08-795 102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No.	24	DATE	1st April '89
RIG No.	2	SPUD DATE	9/3
DEPTH	2482m	TO	2603m

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS
WELL NAME AND No.	WINDERMERE # 2	FIELD OR BLOCK No.	PEP 111
LOCATION	OTWAY BASIN	STATE	VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	8½"
TYPE	S-31-G
JET SIZE	10.14.B
DRILL PIPE SIZE	4½"
TYPE	16.6
LENGTH	2330
DRILL PIPE SIZE	4½"
TYPE	HW
LENGTH	55-84
DRILL COLLAR SIZE	6½"
LENGTH	216-92
13⅜ SURFACE SET @	313 m
9⅝ INTERMEDIATE SET @	1867 m
PRODUCTION OR LINER SET @	— FT
MUD TYPE	WATER
HOLE	570
PITS	165
TOTAL CIRCULATING VOL	735
IN STORAGE	370
WEIGHT	9.2
PUMP SIZE	6 x 8½ IN. / 5 / 15
PUMP MAKE, MODEL	NAT. 8-P-80 / K-500-A
ASSUMED EFF %	96/95 %
BBL/STK	.071 / .0995
STK/MIN	105
BBL/MIN	7.5
GAL/MIN	315
CIRCULATION PRESSURE (PSI)	2100
BOTTOMS UP (MIN)	61
TOTAL CIRC. TIME (MIN)	100
ANNULAR VEL (FT/MIN) D.C.	257
D.P.	148

MUD PROPERTIES 2/4

SAMPLE FROM	FL / PIT	FL / PIT
TIME SAMPLE TAKEN	MUD	05-30
FLOWLINE TEMPERATURE °C	IN	33
DEPTH (m)	PITS	2604
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G	9.2	8.4
FUNNEL VISCOSITY (sec./qt.) API @ °C	32	
PLASTIC VISCOSITY cP @ °C	7	
YIELD POINT (lb/100ft²)	3	
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	1 / 1	/
FILTRATE API (cm³/30 min.)	14.5	
API HTHP FILTRATE (cm³/30 min.) @ °C	—	
CAKE THICKNESS (32nd in. API/HTHP)	1 / —	/
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	6.0	
LIQUID CONTENT (% BY Vol.) OIL/WATER	— / 94.0	/
SAND CONTENT (% BY Vol.)	0	
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	15	
PH ☑ STRIP ☐ METER @ °C	9.0	7.5
ALKALINITY MUD (Pm)	—	
ALKALINITY FILTRATE (P_f/M_f)	+	0 / .2
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	.1 / .3	+
CHLORIDE (mg/L)	14500	8500
TOTAL HARDNESS AS CALCIUM (mg/L)	480	680
SULPHITE (mg/L)	Tr	—
K^+ (mg/L)	8500	3500
KCL (% BY Vol.)	1.6	.7
Iodide (mg/L)	100	50

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
WATER		
PLASTIC VISCOSITY	YIELD POINT	

BY AUTHORITY: ☐ OPERATOR'S WRITTEN ☑ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Dumped entire water system twice due to solids (and : Wt.) build up.

OPERATIONS SUMMARY

Drill to 2603m
Trip Bit.

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT	
FLUID RECEIVED	
WATER ADDED	
FLUID DISPOSED	
HOLE VOL. INCREASE	30

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		0	Desilter	0	10x4"	Shaker No. 1	80/80	0
Degasser			Desander	0	4x6"	Shaker No. 2	40/100	20½

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
Nil						

SOLIDS ANALYSIS

	lb/bbl	%
Barite	Mud in Pits	
Bentonite	10	1.1
Drill Solids	49	5.4
LGS	59	6.5
Salt	8	.1
N =		
K =		

BIT/HYD. PRESS. DATA

Jet Velocity	443
Impact Force	607
HHP	278
HSI	4.8
Bit Press Loss	1500
CSG Seat Frac Press	1100 psi
ECD @ CSG Seat	12.6+
ECD @ Bottom	

DAILY COST: $ —

CUMULATIVE COST: $24,520.63

I.D.F.S. ENGINEER	HOME ADDRESS	TELEPHONE
ANDRE SKUJINS	ADELAIDE	08-745102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No. 25	DATE 2ND APRIL '8		
RIG No. 2	SPUD DATE 9/3		
DEPTH 2603 M	TO 2737 M		

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL LELINAS
WELL NAME AND No.	WINDERMERE # 2	FIELD OR BLOCK No. PEP 111 / LOCATION OTWAY BASIN	STATE SA

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE 8½"	TYPE HP-43	JET SIZE 10-13-6	13⅜" SURFACE SET @ 313 M	HOLE 700	PITS 180	PUMP SIZE 6 x 8½ IN. / 5 15		CIRCULATION PRESSURE (PSI) 2200
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 2464	9⅝" INTERMEDIATE SET @ 1867 M	TOTAL CIRCULATING VOL. 880		PUMP MAKE, MODEL NAT: 8-P-80/K-500-A	ASSUMED EFF 96/95%	BOTTOMS UP (MIN) 81
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84	PRODUCTION OR LINER SET @ — FT.	IN STORAGE —	WEIGHT	BBL/STK .071/.095	STK/MIN 100	TOTAL CIRC. TIME (MIN) 125
DRILL COLLAR SIZE 6½"		LENGTH 216.42	MUD TYPE WATER			BBL/MIN 7.1	300 GAL/MIN	ANNULAR VEL. (FT/MIN) D.C. 245 D.P. 141

MUD PROPERTIES

	☐ FL ☑ PIT	☐ FL ☑ PIT
SAMPLE FROM		
TIME SAMPLE TAKEN		06-00
FLOWLINE TEMPERATURE °C		40
DEPTH (M)		2772
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G		8.4
FUNNEL VISCOSITY (sec./qt.) API @ °C		
PLASTIC VISCOSITY cP @ °C		
YIELD POINT (lb/100ft²)		
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	/	/
FILTRATE API (cm³/30 min.)		
API HTHP FILTRATE (cm³/30 min.) @ °C		
CAKE THICKNESS (32nd in. API/HTHP)	/	/
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT		
LIQUID CONTENT (% BY Vol.) OIL/WATER	/	/
SAND CONTENT (% BY Vol.)		
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud		
PH ☑ STRIP ☐ METER @ °C		7
ALKALINITY MUD (Pm)		—
ALKALINITY FILTRATE (Pf/Mf)	/	0 / .3
ALTERNATE ALKALINITY FILTRATE (P1/P2)	/	/
CHLORIDE (mg/L)		1200
TOTAL HARDNESS AS CALCIUM (mg/L)		240
SULPHITE (mg/L)		
K+ (mg/L)		
KCL (% BY Vol.)		
Nitrate (mg/L)		100

MUD PROPERTY SPECIFICATIONS

WEIGHT	VISCOSITY	FILTRATE
PLASTIC VISCOSITY	YIELD POINT	

BY AUTHORITY: ☐ OPERATOR'S WRITTEN ☐ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Sump Water starting to irretrievably "dirty" ie Difficult to maintain low to no Solids in Water.
∴ Hole displaced w/ fresh Water — 1 sack nitrate then added.

Dump old mud in Pits due to Contamination

Hole 120 bbls Over Gauge @ 2632 m (Loggers' Carbide)

OPERATIONS SUMMARY

Trip Bit.
RIH
Drill Ahead

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT	
FLUID RECEIVED	
WATER ADDED	
FLUID DISPOSED	
HOLE VOL. INCREASE	30

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		0	Desilter	10×4"	0	Shaker No. 1	80/80	0
Degasser			Desander	4×6"	0	Shaker No. 2	40/100	24

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
MAGCOGEL						
CAUSTIC SODA						
SODA ASH						
POLYSAL						
PAC						
SODIUM NITRATE	10	-	1	9	39.75	39.75
SODIUM SULPHITE						

SOLIDS ANALYSIS

	lb/bbl	%
Barite		
Bentonite		
Drill Solids		
LGS		
Salt		
N =		
K =		

BIT/HYD. PRESS. DATA

Jet Velocity	465
Impact Force	606
HHP	285
HSI	5.0
Bit Press Loss	1630
CSG Seat Frac Press	1400 psi
ECD @ CSG Seat	12.6+
ECD @ Bottom	

DAILY COST $39.75

CUMULATIVE COST $24,560.38

I.D.F.S. ENGINEER ANDRE SKUJINS — HOME ADDRESS ADELAIDE — TELEPHONE 08-795102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No.	26	DATE	3RD APRIL 8[illegible]
RIG No.	2	SPUD DATE	9/3
DEPTH	2737m	TO	2882m

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATW APM		
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS		
WELL NAME AND No.	WINDERMERE #2	FIELD OR BLOCK No.	PEP 111	LOCATION OTWAY BASIN	STATE VIC

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE 8½"	TYPE HP 43	JET SIZE 10.13.13	13⅜" SURFACE SET @ 313 m	HOLE 760	PITS 300	PUMP SIZE 6 x 8½ IN / 5 15		CIRCULATION PRESSURE (PSI) 2200
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 2604	9⅝" INTERMEDIATE SET @ 1867 m	TOTAL CIRCULATING VOL 1060		PUMP MAKE, MODEL NAT: 8-P-80 / K-500 A	ASSUMED EFF 94/95 %	BOTTOMS UP (MIN) 88
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84	PRODUCTION OR LINER SET @ FT.	IN STORAGE —	WEIGHT	BBL/STK .071/.095	STK/MIN 100	TOTAL CIRC TIME (MIN) 150
DRILL COLLAR SIZE 6½"		LENGTH 216.92	MUD TYPE WATER / FW POLYMER			BBL/MIN 7.1	300 GAL/MIN	ANNULAR VEL (FT/MIN) DC 245 DP 141

MUD PROPERTIES	FL / PIT	FL / PIT ✓
SAMPLE FROM		PIT
TIME SAMPLE TAKEN		04.30
FLOWLINE TEMPERATURE °C		45
DEPTH (M)		2903
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G		8.5+
FUNNEL VISCOSITY (sec./qt.) API @ °C		30
PLASTIC VISCOSITY cP @ °C		5
YIELD POINT (lb/100ft²)		2
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	/	1 / 1
FILTRATE API (cm³/30 min)		11.5
API HTHP FILTRATE (cm³/30 min.) @ °C		—
CAKE THICKNESS (32nd in. API/HTHP)	/	1 / —
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT		1.6
LIQUID CONTENT (% BY Vol.) OIL/WATER	/	— / 98.4
SAND CONTENT (% BY Vol.)		Tr
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud		2.5
PH ☑ STRIP ☐ METER @ °C		9.0
ALKALINITY MUD (Pm)		—
ALKALINITY FILTRATE (P_f / M_f)	/	.1 / .3
ALTERNATE ALKALINITY FILTRATE (P_1 / P_2)	/	—
CHLORIDE (mg/L)		1400
TOTAL HARDNESS AS CALCIUM (mg/L)		200
SULPHITE (mg/L)		60
K+ (mg/L)		—
KCL (% BY Vol.)		—
Nitrate (mg/L)		250

MUD PROPERTY SPECIFICATIONS

WEIGHT Min	VISCOSITY ~35	FILTRATE 8-10
PLASTIC VISCOSITY	YIELD POINT	PH 9-9.5

BY AUTHORITY: ✓ OPERATOR'S WRITTEN ✓ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Started Displacing hole w/ fresh water to mud up @ 2833 m.
Adding PAL to ↑ Vis & Y.P. and ↓ Fluid Loss.
Changed both Shaker screens to B100/S100.
Hole 150 bbls over gauge — Carbide.

Continue to ↑ Vis and ↓ F.Loss after trip using PAL.

OPERATIONS SUMMARY

Drill Ahead
Tight hole on Connection @ 2775m. Pump Hi Vis Pill (#2 Pump) and work on #1 pump.
Drill Ahead.
Tight hole prior to Survey @ 2882m (#2 pm

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT		
FLUID RECEIVED		
WATER ADDED	1075	Displaced hole + fill tanks
FLUID DISPOSED	15	Desander — Desilter
HOLE VOL. INCREASE	30	

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		5	Desilter	10×4"	6	Shaker No. 1	80/B100	24
Degasser			Desander	4×6"	6	Shaker No. 2	40/B100	6

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander	8.5	14.2	.5
Desilter	8.5	11.3	1.25

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
PAL	54		18	36	91.88	1653.84
NITRATE	9		3	6	39.75	119.25
SODIUM SULPHITE	3	(50kg)	3	0	29.75	89.25
CAUSTIC SODA	27		1	26	28.88	28.88
						1891.22

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	—
Bentonite	1	.1
Drill Solids	14	1.6
LGS	15	1.7
Salt	1	Tr
N =	.78	
K =	.06	

BIT/HYD. PRESS. DATA

Jet Velocity	465
Impact Force	617
HHP	290
HSI	5.1
Bit Press Loss	1660
CSG Seat Frac Press	1100 p.
ECD @ CSG Seat	12.6+
ECD @ Bottom	

DAILY COST $1891.22

CUMULATIVE COST $26,411.85

I.D.F.S. ENGINEER	ANDRE SKUJINS	HOME ADDRESS	ADELAIDE	TELEPHONE	08-795102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No.	27	DATE	4TH APRIL '8
RIG No.	2	SPUD DATE	9/3
DEPTH	2882m	TO	2981m

OPERATOR	MINORA RESOURCES		CONTRACTOR	ATWO APM	
REPORT FOR	JURIS OZOLINS		REPORT FOR	PHIL GELINAS	
WELL NAME AND No.	WINDERMERE # 2	FIELD OR BLOCK No. PEP 111	LOCATION OTWAY BASIN	STATE	VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)	CIRCULATION DATA	
BIT SIZE 8½"	TYPE HP 43	JET SIZE 10-13-13	13⅜" SURFACE SET @ 313 m	HOLE 785 / PITS 340	PUMP SIZE 6 x 8½ IN. / 5 / 15	CIRCULATION PRESSURE (PSI) 2200
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 2708.24	9⅝" INTERMEDIATE SET @ 1867 m	TOTAL CIRCULATING VOL 1125	PUMP MAKE, MODEL NAT: 8-P-80 / K-500 ; ASSUMED EFF 96/45 %	BOTTOMS UP (MIN) 90
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84	PRODUCTION OR LINER SET @ — FT	IN STORAGE — / WEIGHT	BBL/STK .071 / .045 ; STK/MIN 100	TOTAL CIRC. TIME (MIN) 160
DRILL COLLAR SIZE 6½"		LENGTH 216.92	MUD TYPE F.W. POLYMER		BBL/MIN 7.1 ; 300 GAL/MIN	ANNULAR VEL. (FT/MIN) DC 245 / DP 141

MUD PROPERTIES 5/4

SAMPLE FROM	PIT	PIT
TIME SAMPLE TAKEN	15.30	04.30
FLOWLINE TEMPERATURE °C	49	51
DEPTH (M)	2927	3004
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G	8.5+	8.6+
FUNNEL VISCOSITY (sec./qt.) API @ °C	31	30
PLASTIC VISCOSITY cP @ °C	5	4
YIELD POINT (lb/100ft²)	3	2
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	1 / 1	1 / 1
FILTRATE API (cm³/30 min.)	9.0	8.5
API HTHP FILTRATE (cm³/30 min.) @ °C	—	—
CAKE THICKNESS (32nd in. API/HTHP)	1 / —	1 / —
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	1.6	2.4
LIQUID CONTENT (% BY Vol.) OIL/WATER	— / 98.4	— / 97.6
SAND CONTENT (% BY Vol.)	Tr	Tr
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	2.5	6
PH ☑ STRIP ☐ METER @ °C	9.0	10.0
ALKALINITY MUD (Pm)	—	1.6
ALKALINITY FILTRATE (P_f/M_f)	.1 / .3	.4 / .9
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	/	/
CHLORIDE (mg/L)	1400	1500
TOTAL HARDNESS AS CALCIUM (mg/L)	180	20
SULPHITE (mg/L)	60	120
K^+ (mg/L)		
KCL (% BY Vol.)		
Nitrate (mg/L)	150	Tr

MUD PROPERTY SPECIFICATIONS

WEIGHT	MIN	VISCOSITY	CLEAN	FILTRATE	8-10
PLASTIC VISCOSITY	MIN	YIELD POINT	HOLE	pH	9-9.5

BY AUTHORITY ☑ OPERATOR'S WRITTEN ☑ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

1) Since Hole cleaning w/ present Vis/Y.P. is OK, adding Polysal to lower Fluid Loss instead of PAC. At a PAC concentration of approx 1.5 lb/bbl, better performance was expected in a fresh water environment. Fortunately, Polysal working w
2) Higher pH & Alkalinities due to 3sx Soda Ash added since Midnight.
3) Reduction in Nitrates due to additions and increase in concentrations of Sodium Sulphite. See attached Pilot test.

OPERATIONS SUMMARY

Drill to 2903m
POH for Washout.
Lay out Washed Drill Pipe.
RIH.
Drill Ahead.

MUD ACCOUNTING (BBLS.) / SUMMARY

FLUID BUILT	70	Prehydrated PAC
FLUID RECEIVED	70	" "
WATER ADDED	—	
FLUID DISPOSED	30	Desander & Desilter.
HOLE VOL. INCREASE	25	

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		18	Desilter	10x4"	18	Shaker No. 1	B100	18
Degasser		18	Desander	4x6"	18	Shaker No. 2	S100	18

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander	10.6	13.9	.5
Desilter	10.6	10.1	.75

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
PAC	36		14	22	91.88	1286.32
SODIUM SULPHITE	40	(25kg)	2	38	15.00	30.00
CAUSTIC SODA	26		4	22	28.88	115.52
POLYSAL	83		16	67	42.88	686.08
						2117.92

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	—
Bentonite	4	.4
Drill Solids	18	2.0
LGS	22	2.4
Salt	1	Tr
N =	.74	
K =	.06	

BIT/HYD. PRESS. DATA

Jet Velocity	465
Impact Force	624
HHP	294
HSI	5.2
Bit Press Loss	1680
CSG Seat Frac Press	1100 psi
EMW @ CSG Seat	12.65
ECD @ Bottom	

DAILY COST $2117.92 — CUMULATIVE COST $28,569.52

Note: 1) Cost correction - Additional $39.75 onto Cum Cost.
2) Assume $15.00 for 25kg sacks of Na Sulphite

I.D.F.S. ENGINEER	ANDRE SKUJINS	HOME ADDRESS	ADELAIDE	TELEPHONE	08-795 102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No.	28	DATE	5TH APRIL '8[illegible]
RIG No.	2	SPUD DATE	9/3
DEPTH	2981m	TO	3042m

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATW APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS
WELL NAME AND No.	WINDERMERE #2	FIELD OR BLOCK No.	PEP 111
LOCATION	OTWAY BASIN	STATE	VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE 8½"	TYPE HP51-A HP 43	JET SIZE 10.13.B	13⅜ SURFACE SET @ 313 M	HOLE 795	PITS 365	PUMP SIZE 6 x 8½ / 5 15 IN		CIRCULATION PRESSURE (PSI) 2350
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 2769.24	9⅝" INTERMEDIATE SET @ 1867 M	TOTAL CIRCULATING VOL 1160		PUMP MAKE, MODEL NAT: 8-P-80 / K-500	ASSUMED EFF 96/95 %	BOTTOMS UP (MIN) 92
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84	PRODUCTION OR LINER SET @ FT	IN STORAGE	WEIGHT –	BBL/STK .071 / .095	STK/MIN 100	TOTAL CIRC. TIME (MIN) 160
DRILL COLLAR SIZE 6¾"		LENGTH 216.92	MUD TYPE FW POLYMER			BBL/MIN 7.1	300 GAL/MIN	ANNULAR VEL. (FT/MIN) D.C. 245 D.P. 141

MUD PROPERTIES 4/4

SAMPLE FROM	FL ✓ PIT	FL ✓ PIT
TIME SAMPLE TAKEN	23.00	05.00
FLOWLINE TEMPERATURE °C	50	52
DEPTH (M)	3014	3072
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G	8.7+	8.8
FUNNEL VISCOSITY (sec./qt.) API @ °C	30	30
PLASTIC VISCOSITY cP @ °C	4	4
YIELD POINT (lb/100ft²)	2	2
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	1 / 1	1 / 2
FILTRATE API (cm³/30 min.)	7.5	7.8
API HTHP FILTRATE (cm³/30 min.) @ °C	–	–
CAKE THICKNESS (32nd in. API/HTHP)	1 / –	1 / –
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	3.1	3.5
LIQUID CONTENT (% BY Vol.) OIL/WATER	– / 96.9	/ 96.5
SAND CONTENT (% BY Vol.)	Tr	Tr
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	–	6
PH ☑ STRIP ☐ METER @ °C	9.5	9.5
ALKALINITY MUD (Pm)	1.3	1.1
ALKALINITY FILTRATE (P_f/M_f)	.3 / .8	.2 / .6
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	+	+
CHLORIDE (mg/L)	1500	1400
TOTAL HARDNESS AS CALCIUM (mg/L)	20	40
SULPHITE (mg/L)	60	40
K⁺ (mg/L)	–	–
KCL (% BY Vol.)	–	–
NO₃	25	50

MUD PROPERTY SPECIFICATIONS

WEIGHT MIN	VISCOSITY CLEAN	FILTRATE 7-8
PLASTIC VISCOSITY MIN	YIELD POINT HOLE	pH 9-9.5

BY AUTHORITY: ☑ OPERATOR'S WRITTEN ☑ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

1) Maintaining Fluid Loss at approx 7.5 cc.
2) Attempting to increase Nitrates at expense of Sulphites. Presently adding 3 further sacks.

OPERATIONS SUMMARY

Drill to 3005 m
Pooh for suspected Washout (Washed Bit)
RIH w/ new bit.
Wash & ream 15m to btm.
Drill Ahead.

MUD ACCOUNTING (BBLS.) SUMMARY

FLUID BUILT	
FLUID RECEIVED	
WATER ADDED	40 (Approx) while Jetting Cellar.
FLUID DISPOSED	15 Desander + Desilter
HOLE VOL. INCREASE	10

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr
Centrifuge		24	Desilter	10x4"	18	Shaker No. 1	2x100	11
Degasser			Desander	4x6"	18	Shaker No. 2	2x100	11

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander	10.8	13.8	.4
Desilter	10.7+	11.4	.6

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
POLYSAL	67		12	55	42.88	514.56
SODIUM NITRATE	6		3	3	39.75	119.25
SODIUM SULPHITE	38		–	38	15.00	–
SODA ASH	6	(40kg)	–	6	19.40	–
CAUSTIC SODA	22		1	21	28.88	28.88
						662.69

SOLIDS ANALYSIS

	lb/bbl	%
Barite	–	–
Bentonite	3	.3
Drill Solids	29	3.3
LGS	33	3.6
Salt	1	Tr
N =		
K =		

BIT/HYD. PRESS. DATA

Jet Velocity	465
Impact Force	635
HHP	299
HSI	5.3
Bit Press Loss	1700
CSG Seat Frac Press	1100psi
EMW @ CSG Seat	12.65
ECD @ Bottom	

DAILY COST $ 662.69

CUMULATIVE COST $ 29,232.21

I.D.F.S. ENGINEER	ANDRE SKUJINS	HOME ADDRESS	ADELAIDE	TELEPHONE	08-795 102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No.	29	DATE	6th April '8
RIG No.	2	SPUD DATE	9/3
DEPTH	3042 m	TO	3182m

OPERATOR	MINDRA RESOURCES	CONTRACTOR	ATW APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS
WELL NAME AND No.	WINDERMERE #2	FIELD OR BLOCK No. PEP 111 / LOCATION OTWAY BASIN	STATE VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	8½"
TYPE	HP-51-A
JET SIZE	10-13 B
DRILL PIPE SIZE	4½" TYPE 16-6 LENGTH 2909.24
DRILL PIPE SIZE	4½" TYPE HW LENGTH 55.84
DRILL COLLAR SIZE	6¼" LENGTH 216.92
SURFACE	13⅜ SET @ 313 m
INTERMEDIATE	9⅝ SET @ 1867 m
PRODUCTION OR LINER SET @	— FT
MUD TYPE	PW POLYMER
HOLE	825
PITS	315
TOTAL CIRCULATING VOL.	1140
IN STORAGE	—
WEIGHT	—
PUMP SIZE	6 x 8½" IN. / 5 / 15
PUMP MAKE, MODEL	NAT: 8-P-80/F-500-A
ASSUMED EFF	96%
BBL/STK	.071/.045
STK/MIN	100
BBL/MIN	7.1
GAL/MIN	300
CIRCULATION PRESSURE (PSI)	2350
BOTTOMS UP (MIN)	95
TOTAL CIRC. TIME (MIN)	160
ANNULAR VEL. (FT/MIN) D.C.	245
D.P.	141

MUD PROPERTIES 7/4

	FL. / PIT	FL. / PIT
SAMPLE FROM	PIT	PIT
TIME SAMPLE TAKEN	17-30	05-00
FLOWLINE TEMPERATURE °C	52	54
DEPTH (M)	3144	3201
WEIGHT (ppg) (lb/cu.ft) Sp. G	8.9	9.0+
FUNNEL VISCOSITY (sec./qt.) API @ °C	28	30
PLASTIC VISCOSITY cP @ °C	3	4
YIELD POINT (lb/100ft²)	1	4
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	1 / 1	2 / 7
FILTRATE API (cm³/30 min.)	8.0	8.2
API HTHP FILTRATE (cm³/30 min.) @ °C	—	—
CAKE THICKNESS (32nd in. API/HTHP)	1 / —	1 / —
SOLIDS CONTENT (% BY Vol.) CALCD. / RETORT	4.2	5.4
LIQUID CONTENT (% BY Vol.) OIL/WATER	— / 95.8	— / 94.6
SAND CONTENT (% BY Vol.)	Tr	Tr
METHYLENE BLUE CAPACITY lb/bbl equiv. / cm³/cm³ mud	6	10
PH STRIP / METER @ °C	9.0	9.0
ALKALINITY MUD (Pm)	—	—
ALKALINITY FILTRATE (P_f / M_f)	.2 / .5	.2 / .5
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	—	—
CHLORIDE (mg/L)	1500	1500
TOTAL HARDNESS AS CALCIUM (mg/L)	40	100
SULPHITE (mg/L)	Tr	0
K^+ (mg/L)		
KCL (% BY Vol.)		
NO_3 (mg/L)	50	100

MUD PROPERTY SPECIFICATIONS

WEIGHT	MIN	VISCOSITY	CLEAN	FILTRATE	7-8
PLASTIC VISCOSITY	MIN	YIELD POINT	HOLE	pH	9-9.5

BY AUTHORITY: ☑ OPERATOR'S WRITTEN ☑ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

1) Have lost Mud Volume downhole since Midnight.
2) Rheological Values dropped throughout the day (also the pH) due to thinning effect of coals drilled.

OPERATIONS SUMMARY

Drill Ahead.

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT		
FLUID RECEIVED		
WATER ADDED	200	
FLUID DISPOSED	50	Desander + Desilter
HOLE VOL. INCREASE	30	

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		24	Desilter	10×4"	24	Shaker No. 1	B100	24
Degasser			Desander	4×6"	24	Shaker No. 2	5100	24

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander	8.9	13.5	.6
Desilter	8.9	11.0	1.0

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
SODIUM NITRATE	3		3+3*	0	39.75	238.50
SODIUM AMMONIUM NITRATE	0	10	3	7	17.51	52.53
POLYSAL	55		14	41	42.88	600.32
SODA ASH	6		3	3	19.40	58.20
CAUSTIC	21		1	20	28.88	28.88
						978.43

*3 Broken Sacks previously written off.

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	
Bentonite	5	.6
Drill Solids	44	4.9
LGS	50	5.4
Salt	1	Tr
N =	.54	
K =	.21	

BIT/HYD. PRESS. DATA

Jet Velocity	465
Impact Force	653
HHP	307
HSI	5.4
Bit Press Loss	1750
CSG Seat Frac Press	1100
ECD @ CSG Seat	12.6+
ECD @ Bottom	

DAILY COST $978.43

CUMULATIVE COST $30,210.64

I.D.F.S. ENGINEER	ANDRE SIKUTINS	HOME ADDRESS	ADELAIDE	TELEPHONE	08-745 [illegible]

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. **Drilling Mud Report**

REPORT No.	30	DATE	7TH APRIL 89
RIG No.	2	SPUD DATE	9/3
DEPTH	3182m	TO	3231m

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	PHIL GELINAS / KEVIN MURPHY
WELL NAME AND No.	WINDERMERE # 2	FIELD OR BLOCK No.	PEP 111
LOCATION	OTWAY BASIN	STATE	VIC

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE 8½"	TYPE HP-51-A	JET SIZE 10.13.6	13⅜" SURFACE SET @ 313 m	HOLE 840	PITS 305	PUMP SIZE 6 x 8½ / 5 15 IN.		CIRCULATION PRESSURE (PSI) 2350
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 2957.94	9⅝" INTERMEDIATE SET @ 1867 m	TOTAL CIRCULATING VOL. 1145		PUMP MAKE, MODEL NAT: 8-P-80 / K-500-A	ASSUMED EFF 96/95%	BOTTOMS UP (MIN) 96
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84	PRODUCTION OR LINER SET @ — FT.	IN STORAGE —	WEIGHT	BBL/STK .071/.045	STK/MIN 100	TOTAL CIRC TIME (MIN) 160
DRILL COLLAR SIZE 6½"		LENGTH 216.42	MUD TYPE FW POLYMER			BBL/MIN 7.1	300 GAL/MIN	ANNULAR VEL. (FT/MIN) DC 245 / DP 141

MUD PROPERTIES

	☐ F.L. ☑ PIT	☐ F.L. ☑ PIT
SAMPLE FROM		
TIME SAMPLE TAKEN	18.00	
FLOWLINE TEMPERATURE °C	52	
DEPTH (m)	3231	
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G	9.1+	
FUNNEL VISCOSITY (sec/qt.) API @ °C	32	
PLASTIC VISCOSITY cP @ °C	5	D
YIELD POINT (lb/100ft²)	5	
GEL STRENGTH (lb/100ft²) 10 sec/10 min	2 / 8	/
FILTRATE API (cm³/30 min.)	7.4	S
API HTHP FILTRATE (cm³/30 min.) @ °C	—	
CAKE THICKNESS (32nd in. API/HTHP)	1 / —	/
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	6.1	T
LIQUID CONTENT (% BY Vol.) OIL/WATER	— / 93.9	
SAND CONTENT (% BY Vol.)	Tr	
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	12	
PH ☑ STRIP ☐ METER @ °C	9.0	
ALKALINITY MUD (Pm)	1.0	
ALKALINITY FILTRATE (Pf/Mf)	.2 / .4	/
ALTERNATE ALKALINITY FILTRATE (P1/P2)	—	/
CHLORIDE (mg/L)	1500	
TOTAL HARDNESS AS CALCIUM (mg/L)	120	
SULPHITE (mg/L)	0	
K+ (mg/L)	—	
KCL (% BY Vol.)	—	
Nitrate (mg/L)	150	

MUD PROPERTY SPECIFICATIONS

WEIGHT MIN	VISCOSITY CLEAN	FILTRATE 7-8
PLASTIC VISCOSITY MIN	YIELD POINT HOLE	PH 9-9.5

BY AUTHORITY: ☒ OPERATOR'S WRITTEN ☒ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Increase in Weight probably due to more dispersed clays drilled. This is evidenced by an incr in Rheological Values and MBT.

OPERATIONS SUMMARY

Drill to 3231m.
Circ.
POH Wiper trip to Shoe.
RIH. 2½ m Fill.
Circ Hi Vis Pill through hole.
Pump Barite Heavy Wt Pill.
POH

MUD ACCOUNTING (BBLS.)

		SUMMARY
FLUID BUILT	75	Premixed Stock.
FLUID RECEIVED	75	
WATER ADDED	—	
FLUID DISPOSED	45	Desander & Desilter
HOLE VOL. INCREASE	15	
Lost Down hole	25	

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr
Centrifuge		24	Desilter	10x4"	24	Shaker No. 1	8100	16
Degasser			Desander	4x6"	24	Shaker No. 2	5100	16

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander	9.2	13.7	.75
Desilter	9.1+	10.9	1.0

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
AMMONIUM NITRATE	7		3	4	17.51	52.53
POLYSAL	41		9	32	42.88	385.92
CAUSTIC SODA	20		1	19	28.88	28.88
PAC	22		1	21	91.88	91.88
BARYTES	432		18	414	9.60	172.80
CALCIUM CHLORIDE	66		1 *	65		
						732.01

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	—
Bentonite	7	.7
Drill Solids	49	5.5
LGS	56	6.2
Salt	1	Tr
N =	.58	
K =	.26	

BIT/HYD. PRESS. DATA

Jet Velocity	465
Impact Force	660
HHP	311
HSI	5.5
Bit Press Loss	1775
CSG Seat Frac Press	1100psi
ECD @ CSG Seat	12.6+
ECD @ Bottom	

Note: Cost Adjustment to Cumm. Cost - 5sx M.I. Gel on Mud report # 15 not used in Mud - Used in Cement Job. (-193.00)
* Used in Hub Cushion for DST # 2

DAILY COST $732.01

CUMULATIVE COST $30,849.65

I.D.F.S. ENGINEER	ANDRE SKUJINS	HOME ADDRESS	ADELAIDE	TELEPHONE	08-795102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No. 31	DATE 8TH APRIL '89	RIG No. 2	SPUD DATE 9/3
DEPTH 3231m	TO		

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	KEVIN MURPHY
WELL NAME AND No.	WINDERMERE #2	FIELD OR BLOCK No.	PEP 111
LOCATION	OTWAY BASIN	STATE	VIC

DRILLING ASSEMBLY		CASING	MUD VOLUME (BBL)	CIRCULATION DATA
BIT SIZE 8½"	TYPE / JET SIZE	13⅜" SURFACE SET @ 313 m	HOLE 840 / PITS 305	PUMP SIZE 6 x 8½ IN. / 5 15
DRILL PIPE SIZE 4½"	TYPE 16.6 / LENGTH 2957.94	9⅝" INTERMEDIATE SET @ 1867 m	TOTAL CIRCULATING VOL. 1145	PUMP MAKE, MODEL NAT: 8-P-80 / K-500; ASSUMED EFF 96/95%
DRILL PIPE SIZE 4½	TYPE HW / LENGTH 55.84	PRODUCTION OR LINER SET @ FT.	IN STORAGE — / WEIGHT	BBL/STK .071/.095 STK/MIN
DRILL COLLAR SIZE 6½"	LENGTH 216.92	MUD TYPE FW POLYMER		BBL/MIN GAL/MIN

CIRCULATION PRESSURE (PSI): BOTTOMS UP (MIN): TOTAL CIRC TIME (MIN): ANNULAR VEL. (FT/MIN) DC DP

MUD PROPERTIES

	FL / PIT	FL / PIT
SAMPLE FROM	PIT	
TIME SAMPLE TAKEN	23.30	
FLOWLINE TEMPERATURE °C	PIT	
DEPTH (ft)	CHECK	
WEIGHT (ppg) (lb/cu.ft) Sp. G	9.0+	
FUNNEL VISCOSITY (sec./qt.) API @ °C	30	
PLASTIC VISCOSITY cP @ °C	5	
YIELD POINT (lb/100ft²)	4	
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	2 / 5	/
FILTRATE API (cm³/30 min.)	7.7	
API HTHP FILTRATE (cm³/30 min.) @ °C	—	
CAKE THICKNESS (32nd in. API/HTHP)	1 / —	/
SOLIDS CONTENT (% BY Vol.) CALCD. RETORT	5.4	
LIQUID CONTENT (% BY Vol.) OIL/WATER	— / 94.6	/
SAND CONTENT (% BY Vol.)	Tr	
METHYLENE BLUE CAPACITY lb/bbl equiv. cm³/cm³ mud	12	
pH STRIP METER @ °C	9.0	
ALKALINITY MUD (Pm)	—	
ALKALINITY FILTRATE (P_f/M_f)	.1 / .4	/
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	+	/
CHLORIDE (mg/L)	1500	
TOTAL HARDNESS AS CALCIUM (mg/L)	140	
SULPHITE (mg/L)	—	
K^+ (mg/L)	—	
KCL (% BY Vol.)	—	
ok	150	

MUD PROPERTY SPECIFICATIONS

WEIGHT MIN	VISCOSITY CLEAN	FILTRATE 7-8 cc
PLASTIC VISCOSITY MIN	YIELD POINT HOLE	pH 9-9.5

BY AUTHORITY: OPERATOR'S WRITTEN / OPERATOR'S REPRESENTATIVE / DRILLING CONTRACTOR / OTHER

RECOMMENDATIONS

Reduction in Mud Wt. in Pits due to continuous Operation of Solids Control equipment

OPERATIONS SUMMARY

Make up Test Tools.
RIH.
Attempt DST #2.
No Packer Seat
POH
Lay down tools.
Lay down & make up Drill Pipe.
Make up Test tools. RIH

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT
FLUID RECEIVED
WATER ADDED
FLUID DISPOSED
HOLE VOL. INCREASE

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		12	Desilter	10x4"	24	Shaker No. 1	8100	0
Degasser			Desander	4x6"	24	Shaker No. 2	5100	0

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
Calcium Chloride	65		1 8	64		

8 Used for DST #3

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	—
Bentonite	7	.8
Drill Solids	42	4.6
LGS	50	5.4
Salt	1	Tr
N =		
K =		

BIT/HYD. PRESS. DATA

Jet Velocity
Impact Force
HHP
HSI
Bit Press Loss
CSG Seat Frac Press
ECD @ CSG Seat
ECD @ Bottom

DAILY COST $—
CUMULATIVE COST $30,849.65

I.D.F.S. ENGINEER: ANDRE SKUJINS — HOME ADDRESS: ADELAIDE — TELEPHONE: 08-795102

Any opinion and/or recommendation, expressed orally or written herein, has been prepared carefully and may be used if the user so elects, however, no representation or warranty...

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No.	32	DATE	9th April '89
RIG No.	0	SPUD DATE	9/3
DEPTH	3231m	TO	

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM		
REPORT FOR	JURIS OZOLINS	REPORT FOR	KEVIN MURPHY		
WELL NAME AND No.	WINDERMERE #2	FIELD OR BLOCK No.	PEP 111	LOCATION OTWAY BASIN	STATE VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	8½"
TYPE	HP 51 A
JET SIZE	10-13-13
DRILL PIPE SIZE	4½"
TYPE	16.6
LENGTH	2957.94
DRILL PIPE SIZE	4½"
TYPE	HW
LENGTH	55.84
DRILL COLLAR SIZE	6¼"
LENGTH	216.92
SURFACE (13⅜") SET @	313 m
INTERMEDIATE (9⅝") SET @	1867 m
PRODUCTION OR LINER SET @ FT	
MUD TYPE	FW POLYMER
HOLE	840
PITS	305
TOTAL CIRCULATING VOL	1145
IN STORAGE	—
WEIGHT	
PUMP SIZE	6 x 8½ IN. / 5 / 15
PUMP MAKE, MODEL	NAT. 8-P-80 / K-500
ASSUMED EFF	94/95%
BBL/STK	.071 / .995
STK/MIN	95
BBL/MIN	6.75
GAL/MIN	285
CIRCULATION PRESSURE (PSI)	2250
BOTTOMS UP (MIN)	101
TOTAL CIRC. TIME (MIN)	170
ANNULAR VEL. (FT/MIN) DC.	232
D.P.	134

MUD PROPERTIES 10/4

	F.L. PIT	F.L. PIT
SAMPLE FROM		
TIME SAMPLE TAKEN		05.00
FLOWLINE TEMPERATURE °C		51
DEPTH (m)		3255
WEIGHT (ppg) (lb/cu.ft) Sp. G		9.0+
FUNNEL VISCOSITY (sec./qt.) API @ °C		32
PLASTIC VISCOSITY cP @ °C		6
YIELD POINT (lb/100ft²)		7
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	/	3/9
FILTRATE API (cm³/30 min.)		8.3
API HTHP FILTRATE (cm³/30 min.) @ °C		—
CAKE THICKNESS (32nd in. API/HTHP)	/	1/—
SOLIDS CONTENT (% BY Vol.) CALCD. RETORT		5.4
LIQUID CONTENT (% BY Vol.) OIL/WATER	/	/94.6
SAND CONTENT (% BY Vol.)		Tr
METHYLENE BLUE CAPACITY lb/bbl equiv. cm³/cm³ mud		15
PH STRIP METER @ °C		9.0
ALKALINITY MUD (Pm)		.8
ALKALINITY FILTRATE (Pf/Mf)	/	.1/.3
ALTERNATE ALKALINITY FILTRATE (P1/P2)	/	+
CHLORIDE (mg/L)		1500
TOTAL HARDNESS AS CALCIUM (mg/L)		180
SULPHITE (mg/L)		—
K+ (mg/L)		—
KCL (% BY Vol.)		—
PAGE (mg/L)		250+

MUD PROPERTY SPECIFICATIONS

WEIGHT MIN	VISCOSITY CLEAN	FILTRATE 7-8
PLASTIC VISCOSITY MIN	YIELD POINT HOLE	pH 9-9.5

BY AUTHORITY: OPERATOR'S WRITTEN / OPERATOR'S REPRESENTATIVE / DRILLING CONTRACTOR / OTHER

RECOMMENDATIONS

No mud lost to hole through out Testing Period.

OPERATIONS SUMMARY

RIH w/ Test Tools.
Conduct DST #3.
POH. Lay down Test Tools.
RIH w/ Bit.
Wash & ream 3213m - btm.

MUD ACCOUNTING (BBLS.) / SUMMARY

FLUID BUILT —
FLUID RECEIVED —
WATER ADDED —

FLUID DISPOSED Negligible through Desander & Desilter until Midnight.
HOLE VOL. INCREASE —

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		12	Desilter	10x4"	24	Shaker No. 1	840	1
Degasser			Desander	4x6"	24	Shaker No. 2	500	1

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander		14.2	1.5
Desilter		12.0	0.7

This Analysis done after Midnight.

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
AMMONIUM NITRATE	4		2	2	17.51	35.02
POLYSAL	32		5	27	42.88	214.40
CAUSTIC SODA	19		1	18	28.88	28.88
						278.30

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	—
Bentonite	11	1.2
Drill Solids	38	4.3
LGS	50	5.4
Salt	1	Tr
N =	.55	
K =	.43	

BIT/HYD. PRESS. DATA

Jet Velocity	441
Impact Force	589
HHP	263
HSI	4.6
Bit Press Loss	1600
CSG Seat Frac Press	1100 psi
EMW @ CSG Seat	12.6 ppg
ECD @ Bottom	

DAILY COST $278.30 CUMULATIVE COST $31127.95

I.D.F.S. ENGINEER	ANDRE SKUJINS	HOME ADDRESS	ADELAIDE	TELEPHONE	08-295102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No.	33	DATE	10TH APRIL '8
RIG No.	2	SPUD DATE	9/3
DEPTH	3231M	TO	3341

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO ADM
REPORT FOR	JURIS OZOLINS	REPORT FOR	KEVIN MURPHY
WELL NAME AND No.	WINDERMERE #2	FIELD OR BLOCK No. PEP 111 / LOCATION OTWAY BASIN	STATE VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

BIT SIZE	8½"
TYPE	AP 51 A
JET SIZE	10.13.8
DRILL PIPE SIZE	4½" / TYPE 16.6 / LENGTH 3068.24
DRILL PIPE SIZE	4½" / TYPE HW / LENGTH 55.44
DRILL COLLAR SIZE	6¾" / LENGTH 216.92
CASING SURFACE	13⅜ SET @ 313 M
INTERMEDIATE	9⅝ SET @ 1867 M
PRODUCTION OR LINER SET @	FT.
MUD TYPE	FW POLYMER
HOLE	860
PITS	310
TOTAL CIRCULATING VOL.	1170
IN STORAGE	– WEIGHT
PUMP SIZE	6 x 8½ IN. / 5 15
PUMP MAKE, MODEL	NAT: 8-P-80 / K500
ASSUMED EFF	96.95%
BBL/STK	.071 / .945
STK/MIN	95
BBL/MIN	6.8
GAL/MIN	285
CIRCULATION PRESSURE (PSI)	2250
BOTTOMS UP (MIN)	104
TOTAL CIRC. TIME (MIN)	170
ANNULAR VEL. (FT/MIN) D.C.	232
D.P.	134

MUD PROPERTIES 10/4

SAMPLE FROM	☐ F.L. ☑ PIT	☐ F.L. ☑ PIT
TIME SAMPLE TAKEN	18.00	05.00
FLOWLINE TEMPERATURE °C	54	55
DEPTH (M)	3320	3351
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G	9.1+	9.2
FUNNEL VISCOSITY (sec./qt.) API @ °C	32	34
PLASTIC VISCOSITY cP @ °C	4	6
YIELD POINT (lb/100ft²)	5	6
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	2 / 8	3 / 10
FILTRATE API (cm³/30 min.)	8.0	7.5
API HTHP FILTRATE (cm³/30 min.) @ °C	–	–
CAKE THICKNESS (32nd in. API/HTHP)	1 / –	1 / –
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	6.1	6.5
LIQUID CONTENT (% BY Vol.) OIL/WATER	– / 93.9	– / 93.5
SAND CONTENT (% BY Vol.)	Tr	Tr
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	16	15
PH ☑ STRIP ☐ METER @ °C	9.0	9.0
ALKALINITY MUD (Pm)	.8	.7
ALKALINITY FILTRATE (P_f/M_f)	–	–
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	.2 / .6	.1 / .5
CHLORIDE (mg/L)	1500	1400
TOTAL HARDNESS AS CALCIUM (mg/L)	80	100
SULPHITE (mg/L)	–	–
K+ (mg/L)	–	–
KCL (% BY Vol.)	–	–
K^+ to (mg/L)	300	300

MUD PROPERTY SPECIFICATIONS

WEIGHT MIN	VISCOSITY CLEAN	FILTRATE 7-8
PLASTIC VISCOSITY MIN	YIELD POINT HOLE	pH 9-9.5

BY AUTHORITY: ☒ OPERATOR'S WRITTEN ☐ DRILLING CONTRACTOR ☒ OPERATOR'S REPRESENTATIVE ☐ OTHER

RECOMMENDATIONS

Adding Polysal for Fluid Loss Control. Since midnight, have also added 2sx PAC for Fluid Loss.
This is probable reason (PAC) for slight increase in Rheological properties.

OPERATIONS SUMMARY

Drill to 3236m.
Work Pipe due to High Torque.
Drill Ahead.

MUD ACCOUNTING (BBLS.) / SUMMARY

FLUID BUILT	20	Water + Mud + Polysal
FLUID RECEIVED	20	" " "
WATER ADDED	80	At Shakers.
FLUID DISPOSED	75	Desander + Desilter.
HOLE VOL. INCREASE	20	

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		24	Desilter	10x4"	24	Shaker No. 1	B100	24
Degasser			Desander	4x6"	24	Shaker No. 2	B120	24

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander	9.2	14.2	1.5
Desilter	9.1+	11.8	.6

Product	Starting Inventory	~~Received~~ Sent to	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
POLYSAL	27	Adelaide	12	15	42.88	514.56
CAUSTIC SODA	18	↓	3	15	28.88	86.64
SODA ASH	3		1	2	19.40	19.40
KWIK THIK	139	139		0		620.60
MICA	108	108		0		
NUTPLUG	115	115		0		
KWIK SEAL	20	20		0		
SAPP	20	20		0		

SOLIDS ANALYSIS

	lb/bbl	%
Barite	–	–
Bentonite	9	1.1
Drill Solids	50	5.5
LGS	60	6.6
Salt	1	Tr
N =	.58	
K =	.31	

BIT/HYD. PRESS. DATA

Jet Velocity	441
Impact Force	599
HHP	268
HSI	4.7
Bit Press Loss	1600
CSG Seat Frac Press	1100 psi
EMW @ CSG Seat	12.6
ECD @ Bottom	

DAILY COST $620.60

CUMULATIVE COST $31,748.55

I.D.F.S. ENGINEER	ANDRE SIGUTINS	HOME ADDRESS	ADELAIDE	TELEPHONE	08-795102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No.	34	DATE	11TH APRIL '89
RIG No.	2	SPUD DATE	9/3
DEPTH	3341M	TO	3438m

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	KEVIN MURPHY
WELL NAME AND No.	WINDERMERE #2	FIELD OR BLOCK No.	PEP 111
LOCATION	OTWAY BASIN	STATE	VIC

DRILLING ASSEMBLY

BIT SIZE 8½"	TYPE HP 51 A	JET SIZE 10.13.6
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 3165.24
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84
DRILL COLLAR SIZE 6½"		LENGTH 216.92

CASING

13⅜" SURFACE SET @	313 M
9⅝" INTERMEDIATE SET @	1867 M
PRODUCTION OR LINER SET @	FT.
MUD TYPE	FW POLYMER

MUD VOLUME (BBL)

HOLE 880	PITS 350
TOTAL CIRCULATING VOL. 1230	
IN STORAGE —	WEIGHT

CIRCULATION DATA

PUMP SIZE	6 x 8½ IN. / 5 x 15
PUMP MAKE, MODEL	NAT. 8-P-80 / K-500
ASSUMED EFF	90/95%
BBL/STK	.071 / .0095
STK/MIN	95
BBL/MIN	6.8
GAL/MIN	285
CIRCULATION PRESSURE (PSI)	2275
BOTTOMS UP (MIN)	106
TOTAL CIRC. TIME (MIN)	180
ANNULAR VEL. (FT/MIN) D.C.	232
D.P.	134

MUD PROPERTIES 12/4

SAMPLE FROM	☐ FL ☑ PIT	☐ FL ☑ PIT
TIME SAMPLE TAKEN	23.45	05.00
FLOWLINE TEMPERATURE °C	56	57
DEPTH (M)	3436	3450
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G	9.2+	9.2+
FUNNEL VISCOSITY (sec./qt.) API @ °C	33	34
PLASTIC VISCOSITY cP @ °C	5	6
YIELD POINT (lb/100ft²)	6	7
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	2/8	3/10
FILTRATE API (cm³/30 min.)	8.3	8.2
API HTHP FILTRATE (cm³/30 min.) @ °C	—	—
CAKE THICKNESS (32nd in. API/HTHP)	1/—	1/—
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	6.9	6.9
LIQUID CONTENT (% BY Vol.) OIL/WATER	—/93.1	—/93.1
SAND CONTENT (% BY Vol.)	Tr	Tr
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	14	14
PH ☑ STRIP ☐ METER @ °C	9.5	9.0
ALKALINITY MUD (Pm)	.8	.5
ALKALINITY FILTRATE (P_f/M_f)	.2/.6	.1/.4
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	/	/
CHLORIDE (mg/L)	1500	1500
TOTAL HARDNESS AS CALCIUM (mg/L)	80	80
SULPHITE (mg/L)	—	—
K^+ (mg/L)	—	—
KCL (% BY Vol.)	—	—
Nitrate (mg/L)	300	300

MUD PROPERTY SPECIFICATIONS

WEIGHT MIN	VISCOSITY CLEAN	FILTRATE 7-8
PLASTIC VISCOSITY MIN	YIELD POINT HOLE	pH 9-9.5

BY AUTHORITY: ☒ OPERATOR'S WRITTEN ☒ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Adding Polysal + PAC for Fluid Loss Control.

OPERATIONS SUMMARY

Drill

MUD ACCOUNTING (BBLS.)

		SUMMARY
FLUID BUILT	25	Water + Mud + PAC + Polysal
FLUID RECEIVED	25	" " " "
WATER ADDED	95	Water at Shakes.
	120	
FLUID DISPOSED	60	Desander + Desilter
HOLE VOL. INCREASE	20	

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr
Centrifuge		24	Desilter	10x4"	24	Shaker No. 1	B/00	24
Degasser			Desander	4x6"	24	Shaker No. 2	B/00	24

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander	9.2+	14.0	1.3
Desilter	9.2+	12.0	.5

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
POLYSAL	15		10	5	42.88	428.80
CAUSTIC SODA	15		3	12	28.88	86.64
PAC	21		4	17	91.88	367.52
						882.96

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	—
Bentonite	8	.9
Drill Solids	55	6.1
LGS	63	6.9
Salt	1	Tr
N =	.55	
K =	.43	

BIT/HYD. PRESS. DATA

Jet Velocity	441
Impact Force	602
HHP	269
HSI	4.7
Bit Press Loss	1625
CSG Seat Frac Press	1100 PSI
EMW @ CSG Seat	12.6 ppg
ECD @ Bottom	

DAILY COST $882.96

CUMULATIVE COST $32,631.51

I.D.F.S. ENGINEER	ANDRE SKUJINS	HOME ADDRESS	ADELAIDE	TELEPHONE	08-795 102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. **Drilling Mud Report**

REPORT No. 35	DATE 12th April '8
RIG No. 2	SPUD DATE 9/3
DEPTH 3438m	TO 3514

OPERATOR: Minora Resources	CONTRACTOR: Atco APM
REPORT FOR: Juris Ozolins	REPORT FOR: Kevin Murphy
WELL NAME AND No.: Windermere # 2	FIELD OR BLOCK No.: PEP 111 — LOCATION: Otway Basin — STATE: Vic

DRILLING ASSEMBLY

BIT SIZE 8½"	TYPE HP 51 A	JET SIZE 10-13 6	
DRILL PIPE SIZE 4½"	TYPE [illegible]	LENGTH 3241.24	
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84	
DRILL COLLAR SIZE 6½"		LENGTH 216.92	

CASING: 13⅜" SURFACE SET @ 313 m; 9⅝" INTERMEDIATE SET @ 1867 m; PRODUCTION OR LINER SET @ — FT.

MUD VOLUME (BBL): HOLE 895; PITS 350; TOTAL CIRCULATING VOL. 1245; IN STORAGE —; WEIGHT

MUD TYPE: FW Polymer

CIRCULATION DATA

PUMP SIZE 6 x 8½ IN. / 5 x 15	CIRCULATION PRESSURE (PSI) 2275
PUMP MAKE, MODEL NAT 8-P-80 / K-500 — ASSUMED EFF 96.5%	BOTTOMS UP (MIN) 108
BBL/STK .071 / .0995 — STK/MIN 95	TOTAL CIRC. TIME (MIN) 180
BBL/MIN 6.8 — 285 GAL/MIN	ANNULAR VEL. (FT/MIN) DC 232 / DP 134

MUD PROPERTIES 13/4

	☐ FL. ☑ PIT	☐ FL. ☑ PIT
SAMPLE FROM		
TIME SAMPLE TAKEN	17-30	04-45
FLOWLINE TEMPERATURE °C	59	58
DEPTH (m)	3494	3530
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G	9.3	9.3+
FUNNEL VISCOSITY (sec./qt.) API @ °C	33	35
PLASTIC VISCOSITY cP @ °C	6	8
YIELD POINT (lb/100ft²)	6	7
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	3 / 11	4 / 14
FILTRATE API (cm³/30 min.)	8.6	8.8
API HTHP FILTRATE (cm³/30 min.) @ °C	—	—
CAKE THICKNESS (32nd in. API/HTHP)	1 / —	1 / —
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	7.2	7.6
LIQUID CONTENT (% BY Vol.) OIL/WATER	— 92.8	— 92.4
SAND CONTENT (% BY Vol.)	Tr	Tr
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	15	16
PH ☑ STRIP ☐ METER @ °C	9.0	9.0
ALKALINITY MUD (Pm)	.6	.7
ALKALINITY FILTRATE (P_f/M_f)	.1 / .5	.2 / .6
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	+	+
CHLORIDE (mg/L)	1400	1400
TOTAL HARDNESS AS CALCIUM (mg/L)	80	100
SULPHITE (mg/L)	—	—
K^+ (mg/L)	—	—
KCL (% BY Vol.)	—	—
Fe (mg/L)	300	300

MUD PROPERTY SPECIFICATIONS

WEIGHT Min	VISCOSITY Clean	FILTRATE 7-8
PLASTIC VISCOSITY Min	YIELD POINT Hole	pH 9-9.5

BY AUTHORITY: ☑ OPERATOR'S WRITTEN ☑ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

More Polysal, PAC, & Caustic Soda on order.

Difficulties in maintaining Fluid Loss within specs. due mainly to increasing Bottom hole Temperature.

OPERATIONS SUMMARY

Drill

SUMMARY

MUD ACCOUNTING (BBLS.)

- FLUID BUILT
- FLUID RECEIVED
- WATER ADDED 90 At Shakers.
- FLUID DISPOSED 75 Desander + Desilter
- HOLE VOL. INCREASE 15

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr
Centrifuge		24	Desilter	10x4"	24	Shaker No. 1	B100	24
Degasser			Desander	4x6"	24	Shaker No. 2	B120	24

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander	9.3+	13.6	1.25
Desilter	9.3+	11.8	1.0

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
			5	0	42.88	214.40
Polysal	5		4	8	28.88	115.52
Caustic Soda	12		7	10	91.88	643.16
PAC	17					
						973.08

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	—
Bentonite	9	1.0
Drill Solids	60	6.7
LGS	70	7.7
Salt	1	Tr
N =	.62	
K =	.32	

BIT/HYD. PRESS. DATA

Jet Velocity	441
Impact Force	609
HHP	272
HSI	4.8
Bit Press Loss	1650
CSG Seat Frac Press	1100 p
EMW @ CSG Seat	12.6+
ECD @ Bottom	

DAILY COST $973.08 — CUMULATIVE COST $33,604.59

I.D.F.S. ENGINEER Andre Skujins	HOME ADDRESS Adelaide	TELEPHONE 08-795 102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No. 36	DATE 13TH APRIL '8_	RIG No. 2	SPUD DATE 9/3
DEPTH 3514 M	TO 3595 M		

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATW APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	KEVIN MURPHY
WELL NAME AND No.	WINDERMERE # 2	FIELD OR BLOCK No. PEP 111	LOCATION OTWAY BASIN — STATE VIC.

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA		
BIT SIZE 8½"	TYPE HP 51 A	JET SIZE 10.13.B	13⅜ SURFACE SET @ 313 M	HOLE 910	PITS 315	PUMP SIZE 6 x 8½ / 5 15 IN.		CIRCULATION PRESSURE (PSI) 2300
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 3322.24	9⅝ INTERMEDIATE SET @ 1867 M	TOTAL CIRCULATING VOL. 1225		PUMP MAKE, MODEL NAT- 8-P-80/K-500	ASSUMED EFF 96/95%	BOTTOMS UP (MIN) 110
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84	PRODUCTION OR LINER SET @ — FT.	IN STORAGE —	WEIGHT	BBL/STK .071/.0995	STK/MIN 95	TOTAL CIRC. TIME (MIN) 180
DRILL COLLAR SIZE 6½"		LENGTH 216.92	MUD TYPE F.W. POLYMER			BBL/MIN 6.8	288 GAL/MIN	ANNULAR VEL. (FT/MIN) D.C. 235 D.P. 136

MUD PROPERTIES	14/4	
SAMPLE FROM	☐ F.L. ☑ PIT	☐ FL ☑ PIT
TIME SAMPLE TAKEN	19-00	01-00
FLOWLINE TEMPERATURE °C	60	60
DEPTH (M)	3560	3595
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G	9.3+	9.3+
FUNNEL VISCOSITY (sec./qt.) API @ °C	37	37
PLASTIC VISCOSITY cP @ °C	9	9
YIELD POINT (lb/100ft²)	7	8
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	3 / 12	5 / 16
FILTRATE API (cm³/30 min.)	11.4	7.5
API HTHP FILTRATE (cm³/30 min.) @ °C	—	—
CAKE THICKNESS (32nd in. API/HTHP)	1 / —	1 / —
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	7.6	7.6
LIQUID CONTENT (% BY Vol.) OIL/WATER	— / 92.4	— / 92.4
SAND CONTENT (% BY Vol.)	Tr	Tr
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	17½	17½
PH ☑ STRIP ☐ METER @ °C	9.0	9.5
ALKALINITY MUD (Pm)	.6	.8
ALKALINITY FILTRATE (P_f/M_f)	.1 / .5	.2 / .8
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	+	+
CHLORIDE (mg/L)	1400	1400
TOTAL HARDNESS AS CALCIUM (mg/L)	100	100
SULPHITE (mg/L)	—	—
K^+ (mg/L)	—	—
KCL (% BY Vol.)	—	—
[illegible]	300	300

MUD PROPERTY SPECIFICATIONS

WEIGHT	MIN	VISCOSITY	CLEAN	FILTRATE	7-8
PLASTIC VISCOSITY	MIN	YIELD POINT	HOLE	PH	9-9.5

BY AUTHORITY: ☑ OPERATOR'S WRITTEN ☑ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Mud order arrived approx 19:30 hrs. Until that stage only PAC added to try to lower Fluid Loss, with mediocre results. Then 10sx Polysal added with excellent results.

OPERATIONS SUMMARY

Drill to 3595 M (TD)

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT	20	Part of Premix
FLUID RECEIVED	20	" " "
WATER ADDED		
FLUID DISPOSED	40	Desander + Desilter
HOLE VOL. INCREASE	15	

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		24	Desilter	10x4"	24	Shaker No. 1	B100	24
Degasser			Desander	4x6"	24	Shaker No. 2	B120	24

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander	9.3+	13.4	.9
Desilter	9.3+	11.9	.25

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
PAC	10	40	10	40	91.88	918.80
CAUSTIC SODA	8	32	7	33	28.88	202.16
POLYSAL	0	40	10	30	42.88	428.80
						1549.76

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	—
Bentonite	11	1.2
Drill Solids	58	6.5
LGS	70	7.7
Salt	1	Tr
N =	.61	
K =	.37	

BIT/HYD. PRESS. DATA

Jet Velocity	446
Impact Force	682
HHP	281
HSI	4.9
Bit Press Loss	1675
CSG Seat Frac Press	1100 psi
EMW @ CSG Seat	12.6+
ECD @ Bottom	

DAILY COST $1549.76 — CUMULATIVE COST $35,154.35

I.D.F.S. ENGINEER	ANDRE SKUJINS	HOME ADDRESS	ADELAIDE	TELEPHONE	08-795102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No. 37	DATE 14th April '8
RIG No. 2	SPUD DATE 9/3
DEPTH 3595 m (TD) TO	

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM		
REPORT FOR	JURIS OZOLINS	REPORT FOR	KEVIN MURPHY		
WELL NAME AND No.	WINDERMERE #2	FIELD OR BLOCK No.	PEP 111	LOCATION OTWAY BASIN	STATE VIC

DRILLING ASSEMBLY / CASING / MUD VOLUME (BBL) / CIRCULATION DATA

- BIT SIZE 8½" TYPE ATJ51A JET SIZE 10.13.6
- DRILL PIPE SIZE 4½" TYPE 16.6 LENGTH 3322.24
- DRILL PIPE SIZE 4½" TYPE HW LENGTH 55.84
- DRILL COLLAR SIZE 6¼" LENGTH 216.92
- SURFACE 13⅜ SET @ 313 m
- INTERMEDIATE 9⅝ SET @ 1867 m
- PRODUCTION OR LINER SET @ — FT.
- MUD TYPE FW POLYMER
- HOLE 910 PITS 315
- TOTAL CIRCULATING VOL 1225
- IN STORAGE — WEIGHT —
- PUMP SIZE 6 x 8½ IN. / 5 15
- PUMP MAKE, MODEL NAT: 8-P-80 / K-500A
- ASSUMED EFF 96/95%
- BBL/STK .071 / .0495 STK/MIN 96
- BBL/MIN 6.8 288 GAL/MIN
- CIRCULATION PRESSURE (PSI) 2300
- BOTTOMS UP (MIN) 110
- TOTAL CIRC. TIME (MIN) 180
- ANNULAR VEL. (FT/MIN) D.C. 235 D.P. 136

MUD PROPERTIES

	F.L. / PIT	F.L. PIT
SAMPLE FROM		
TIME SAMPLE TAKEN	18-00	
FLOWLINE TEMPERATURE °C	FIT	
DEPTH (ft)	CHECK	
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G	9.35	
FUNNEL VISCOSITY (sec./qt.) API @ °C	38	
PLASTIC VISCOSITY cP @ °C	10	
YIELD POINT (lb/100ft²)	8	
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	4 / 16	/
FILTRATE API (cm³/30 min.)	7.5	
API HTHP FILTRATE (cm³/30 min.) @ °C	—	
CAKE THICKNESS (32nd in. API/HTHP)	1 / —	/
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	7.6	
LIQUID CONTENT (% BY Vol.) OIL/WATER	— / 92.4	/
SAND CONTENT (% BY Vol.)	Tr	
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	17½	
pH ☐ STRIP ☑ METER @ °C	9.5	
ALKALINITY MUD (Pm)	.8	
ALKALINITY FILTRATE (Pf/Mf)	.2 / .8	/
ALTERNATE ALKALINITY FILTRATE (P1/P2)	/	/
CHLORIDE (mg/L)	1400	
TOTAL HARDNESS AS CALCIUM (mg/L)	100	
SULPHITE (mg/L)		
K+ (mg/L)		
KCL (% BY Vol.)		
Nitrate (mg/L)	300	

MUD PROPERTY SPECIFICATIONS

WEIGHT MIN	VISCOSITY CLEAN	FILTRATE 7-8
PLASTIC VISCOSITY MIN	YIELD POINT HOLE	pH 9-9.5

BY AUTHORITY: ☐ OPERATOR'S WRITTEN ☐ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

OPERATIONS SUMMARY

Circ Hi Vis Pill through hole
Pump slug.
Strap out.
Log

MUD ACCOUNTING (BBLS.) — SUMMARY

- FLUID BUILT
- FLUID RECEIVED
- WATER ADDED NIL
- FLUID DISPOSED NIL
- HOLE VOL. INCREASE

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		6	Desilter	10×4"	3	Shaker No. 1	B110	3
Degasser			Desander	4×6"	6	Shaker No. 2	B120	3

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	~~Received~~ Sent to	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
Barytes	414	Adelaide	18	396	9.60	172.80
Lime	47	40	3 *	4		
Soda Ash		42				
Stearate		36				
Magconol / Pipelax		3/1				
XL Polymer		21	* Used in Sewer Pits.			
KCl (Tech Gr)		244				
Sulphite		38				
Dowicide		16				
Magco Gel		240				
$CaCl_2$		40				

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	—
Bentonite	11	1.2
Drill Solids	58	6.5
LGS	70	7.7
Salt	1	Tr
N =		
K =		

BIT/HYD. PRESS. DATA

Jet Velocity	446
Impact Force	662
HHP	281
HSI	4.9
Bit Press Loss	1675
CSG Seat Frac Press	1100 psi
ECD @ CSG Seat	12.64
ECD @ Bottom	

DAILY COST $172.80 CUMULATIVE COST $35,327.15

I.D.F.S. ENGINEER ANDRE SKUJINS HOME ADDRESS ADELAIDE TELEPHONE 08-795102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No. 38	DATE 15th April '89
RIG No. 2	SPUD DATE 9/3
DEPTH 3595m (TD) TO	

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM
REPORT FOR	JURIS OZOLINS	REPORT FOR	KEVIN MURPHY
WELL NAME AND No.	WINDERMERE # 2	FIELD OR BLOCK No. PEP 111	LOCATION OTWAY BASIN / STATE VIC.

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)	CIRCULATION DATA	
BIT SIZE 8½"	TYPE HP51A	JET SIZE 3x13	13⅜ SURFACE SET @ 313 M	HOLE 910 / PITS 370	PUMP SIZE 6 x 8½ IN. / 5 15	CIRCULATION PRESSURE (PSI)
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 3322.24	9⅝ INTERMEDIATE SET @ 1867 M	TOTAL CIRCULATING VOL. 1280	PUMP MAKE, MODEL NAT-8-P-80/K500A / ASSUMED EFF. %	BOTTOMS UP (MIN) 110
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84	PRODUCTION OR LINER SET @ FT	IN STORAGE — / WEIGHT	BBL/STK .071/.0495 / STK/MIN 95	TOTAL CIRC. TIME (MIN) 180
DRILL COLLAR SIZE 6¼"		LENGTH 216.92	MUD TYPE	FW POLYMER	BBL/MIN 6.8 / 285 GAL/MIN	ANNULAR VEL. (FT/MIN) D.C. 222 / D.P. 134

MUD PROPERTIES	FL. / PIT ✓	FL. / PIT
SAMPLE FROM	PIT	
TIME SAMPLE TAKEN	22.30	
FLOWLINE TEMPERATURE °C	58	
DEPTH (M)	3595	
WEIGHT ✓(ppg) (lb/cu.ft) Sp. G	9.4	
FL VISCOSITY (sec./qt.) API @ °C	34	
PLASTIC VISCOSITY cP @ °C	9	
YIELD POINT (lb/100ft²)	7	
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	3 / 13	/
FILTRATE API (cm³/30 min.)	7.8	
API HTHP FILTRATE (cm³/30 min.) @ °C	—	
CAKE THICKNESS (32nd in. API/HTHP)	1 / –	/
SOLIDS CONTENT (% BY Vol.) ✓CALCD. RETORT	8.0	
LIQUID CONTENT (% BY Vol.) OIL/WATER	–/92.0	/
SAND CONTENT (% BY Vol.)	Tr	
METHYLENE BLUE CAPACITY ✓lb/bbl equiv. cm³/cm³ mud	17.2	
PH ✓STRIP METER @ °C	9.0	
ALKALINITY MUD (Pm)	—	
ALKALINITY FILTRATE (P_f/M_f)	.2 / .5	/
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	+	/
CHLORIDE (mg/L)	1400	
TOTAL HARDNESS AS CALCIUM (mg/L)	120	
SULPHITE (mg/L)	—	
K^+ (mg/L)	—	
KCL (% BY Vol.)	—	
ue (mg/L)	300	

MUD PROPERTY SPECIFICATIONS

WEIGHT Min	VISCOSITY CLEAN	FILTRATE 7-8
PLASTIC VISCOSITY Min	YIELD POINT HOLE	PH 9-9.5

BY AUTHORITY: OPERATOR'S WRITTEN / OPERATOR'S REPRESENTATIVE / DRILLING CONTRACTOR / OTHER

RECOMMENDATIONS

Used i) Gel for Hi Vis Pill.
ii) Polysal to lower Fluid Loss of mud in Open Hole.

OPERATIONS SUMMARY

Log.
3rd run Hung up @ 3005 m.
M.U. Bit + BHA.
Ream 2987 – 3041, 3162 – 3243, 3545 – btm.
Pump Hi Vis Pill thru hole.
Pump Slug.
POH.

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT		
FLUID RECEIVED		
WATER ADDED	70	At Shakers.
FLUID DISPOSED	15	Desander + Desilter
HOLE VOL. INCREASE		

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		3	Desilter	10x4"	14	Shaker No. 1	B100	14
Degasser			Desander	4x6"	14	Shaker No. 2	B100	8

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
BARYTES	396		18	378	9.60	172.80
CAUSTIC SODA	33		1	32	28.88	28.88
POLYSAL	30		6	24	42.88	257.28
MAGNO GEL	119		6	113	18.60	111.60
						570.56

SOLIDS ANALYSIS	lb/bbl	%
Barite	—	—
Bentonite	11	1.2
Drill Solids	62	6.9
LGS	73	8.1
Salt	1	Tr
N =		
K =		

BIT/HYD. PRESS. DATA	
Jet Velocity	234
Impact Force	235
HHP	77
HSI	1.4
Bit Press Loss	450
CSG Seat Frac Press	1100psi
ECD @ CSG Seat	12.6+
ECD @ Bottom	

DAILY COST $570.56

CUMULATIVE COST $35,897.71

I.D.F.S. ENGINEER	ANDRE SKUJINS	HOME ADDRESS	ADELAIDE	TELEPHONE	08-295 102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. Drilling Mud Report

REPORT No. 39	DATE 16th April 89	RIG No. 2	SPUD DATE 9/3
DEPTH 3595 m	TO		

OPERATOR	Minora Resources	CONTRACTOR	Atco Apm
REPORT FOR	Juris Ozolins	REPORT FOR	Kevin Murphy
WELL NAME AND No.	Windermere # 2	FIELD OR BLOCK No. PEP 111	LOCATION Otway Basin · STATE Vic

DRILLING ASSEMBLY			CASING	MUD VOLUME (BBL)		CIRCULATION DATA	
BIT SIZE 8½"	TYPE HP 53 A	JET SIZE 2x13/12	13⅜" SURFACE SET @ 313 m	HOLE 910	PITS 370	PUMP SIZE 6 x 8½ IN. / 5 x 15	CIRCULATION PRESSURE (PSI) 1200/1300
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 3322.24	9⅝" INTERMEDIATE SET @ 1867 m	TOTAL CIRCULATING VOL. 1280		PUMP MAKE, MODEL NAT - 8-P-80 / K-500A	ASSUMED EFF 96.5% · BOTTOMS UP (MIN) · TOTAL CIRC. TIME (MIN)
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84	PRODUCTION OR LINER SET @ FT.	IN STORAGE	WEIGHT —	BBL/STK .071/.0495 · STK/MIN 93/116	ANNULAR VEL. (FT/MIN)
DRILL COLLAR SIZE 6½"		LENGTH 216.92	MUD TYPE FW: Polymer			BBL/MIN 6.6/5.73 · GAL/MIN 279/308	D.C. 222 · D.P. 131

MUD PROPERTIES 17/4	FL. / PIT	FL. / PIT
SAMPLE FROM		
TIME SAMPLE TAKEN		05.15
FLOWLINE TEMPERATURE °C		52
DEPTH (ft)		(Reaming) 3555
WEIGHT (ppg) / (lb/cu.ft) / Sp. G		9.4+
FUNNEL VISCOSITY (sec./qt.) API @ °C		33
PLASTIC VISCOSITY cP @ °C		7
YIELD POINT (lb/100ft²)		6
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	/	3 / 9
FILTRATE API (cm³/30 min.)		10.2
API HTHP FILTRATE (cm³/30 min.) @ °C		—
CAKE THICKNESS (32nd in. API/HTHP)	/	1 / —
SOLIDS CONTENT (% BY Vol.) CALCD. / RETORT		8.4
LIQUID CONTENT (% BY Vol.) OIL/WATER	/	— / 91.6
SAND CONTENT (% BY Vol.)		Tr
METHYLENE BLUE CAPACITY lb/bbl equiv. / cm³/cm³ mud		20
PH STRIP / METER @ °C		9.0
ALKALINITY MUD (Pm)		—
ALKALINITY FILTRATE (P_f/M_f)	/	.1 / .5
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	/	+
CHLORIDE (mg/L)		1400
TOTAL HARDNESS AS CALCIUM (mg/L)		120
SULPHITE (mg/L)		—
K^+ (mg/L)		—
KCL (% BY Vol.)		—
Nitrate (mg/L)		300

MUD PROPERTY SPECIFICATIONS

WEIGHT: Min · VISCOSITY: Clean · FILTRATE: 7-8

PLASTIC VISCOSITY: Min · YIELD POINT: Hole · pH 9-9.5

BY AUTHORITY: ☑ OPERATOR'S WRITTEN ☑ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

Will lower Fluid Loss of Mud in Open hole prior to POH to Log.

OPERATIONS SUMMARY

POH.
Log. Run #3 OK.
Run #4 held up on ledge at 3184m
M.U. Bit & RIH.
Work hole 2958 - 3015 m.
Ream 3163 - 3185.

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT —
FLUID RECEIVED —
WATER ADDED —
FLUID DISPOSED Negligible from Desander - Desilter.
HOLE VOL. INCREASE —

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge		0	Desilter	10x4"	4	Shaker No. 1	BW	0
Degasser			Desander	4x6"	4	Shaker No. 2	BW	0

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
Magcogel	108		* 5	103	18.60	93.00

* Broken sacks used on 14/4 for Hi Vis Pill.

SOLIDS ANALYSIS	lb/bbl	%
Barite	—	—
Bentonite	13	1.4
Drill Solids	63	7.0
LGS	77	8.4
Salt	1	Tr
N =	.62	
K =	.27	

BIT/HYD. PRESS. DATA	
Jet Velocity	241
Impact Force	329
HHP	80
HSI	1.4
Bit Press Loss	500
CSG Seat Frac Press	1100 psi
ECD @ CSG Seat	12.6+
ECD @ Bottom	

DAILY COST: $93.00

CUMULATIVE COST: $35,990.71

I.D.F.S. ENGINEER: Andre Skujins · HOME ADDRESS: Adelaide · TELEPHONE: 08-795102

INDEPENDENT DRILLING FLUID SERVICES PTY. LTD.

I.D.F.S. **Drilling Mud Report**

REPORT No.	40	DATE	17TH APRIL '8
RIG No.	2	SPUD DATE	9/3
DEPTH	3595M	TO	

OPERATOR	MINORA RESOURCES	CONTRACTOR	ATCO APM		
REPORT FOR	JURIS OZOLINS	REPORT FOR	KEVIN MURPHY		
WELL NAME AND No.	WINDERMERE #2	FIELD OR BLOCK No.	PEP 111	LOCATION OTWAY BASIN	STATE VIC

DRILLING ASSEMBLY

BIT SIZE 8½"	TYPE HP43A	JET SIZE	
DRILL PIPE SIZE 4½"	TYPE 16.6	LENGTH 3322.24	
DRILL PIPE SIZE 4½"	TYPE HW	LENGTH 55.84	
DRILL COLLAR SIZE 6¾"		LENGTH 216.97	

CASING

13⅜ SURFACE SET @	313 M
9⅝ INTERMEDIATE SET @	1867 M
PRODUCTION OR LINER SET @	FT.
MUD TYPE	FW POLYMER

MUD VOLUME (BBL)

HOLE 910	PITS 370
TOTAL CIRCULATING VOL.	1280
IN STORAGE —	WEIGHT

CIRCULATION DATA

PUMP SIZE 6 X 8½ IN. / 5 15		CIRCULATION PRESSURE (PSI) 2000
PUMP MAKE, MODEL NAT. 8-P-80/K-500A	ASSUMED EFF 90/95 %	BOTTOMS UP (MIN) 12
BBL/STK .071/.0995	STK/MIN 94	TOTAL CIRC. TIME (MIN) 190
BBL/MIN 6.7	282 GAL/MIN	ANNULAR VEL (FT/MIN) D.C. 230 D.P. 133

MUD PROPERTIES

SAMPLE FROM	☐ F.L. ☑ PIT	☐ F.L. ☐ PIT
TIME SAMPLE TAKEN	07.45	
FLOWLINE TEMPERATURE °C	56	
DEPTH (M)	3595	
WEIGHT ☑ (ppg) ☐ (lb/cu.ft) ☐ Sp. G	9.4T	
FUNNEL VISCOSITY (sec./qt.) API @ °C	34	
PLASTIC VISCOSITY cP @ °C	8	
YIELD POINT (lb/100ft²)	7	
GEL STRENGTH (lb/100ft²) 10 sec./10 min.	3 / 11	/
FILTRATE API (cm³/30 min.)	7.6	
API HTHP FILTRATE (cm³/30 min.) @ °C	—	
CAKE THICKNESS (32nd in. API/HTHP)	1 / —	/
SOLIDS CONTENT (% BY Vol.) ☑ CALCD. ☐ RETORT	8.4	
LIQUID CONTENT (% BY Vol.) OIL/WATER	— / 91.6	/
SAND CONTENT (% BY Vol.)	Tr	
METHYLENE BLUE CAPACITY ☑ lb/bbl equiv. ☐ cm³/cm³ mud	20	
PH ☑ STRIP ☐ METER @ °C	9.0	
ALKALINITY MUD (Pm)	—	
ALKALINITY FILTRATE (P_f/M_f)	.2 / .6	/
ALTERNATE ALKALINITY FILTRATE (P_1/P_2)	—	/
CHLORIDE (mg/L)	1400	
TOTAL HARDNESS AS CALCIUM (mg/L)	120	
SULPHITE (mg/L)	—	
K⁺ (mg/L)	—	
KCL (% BY Vol.)	—	
Nitrate (mg/L)	300	

MUD PROPERTY SPECIFICATIONS

WEIGHT MIN	VISCOSITY CLEAN	FILTRATE 7-8
PLASTIC VISCOSITY MIN	YIELD POINT HOLE	pH 9-9.5

BY AUTHORITY: ☑ OPERATOR'S WRITTEN ☑ OPERATOR'S REPRESENTATIVE ☐ DRILLING CONTRACTOR ☐ OTHER

RECOMMENDATIONS

OPERATIONS SUMMARY

Ream 3185 - 3205 m.
POOH to 3163.
Ream back to 3205 m
RIH - 3546 m.
Ream to bottom.
Circ. B.U.
POH.
Log.

MUD ACCOUNTING (BBLS.) — SUMMARY

FLUID BUILT
FLUID RECEIVED
WATER ADDED
FLUID DISPOSED
HOLE VOL. INCREASE

SOLIDS CONTROL EQUIPMENT

	Type	Hr.		No. Cones	Hr.		Screen Sizes	Hr.
Centrifuge	Down		Desilter	10×4"	8	Shaker No. 1	2×80	8
Degasser			Desander	4×6"	8	Shaker No. 2	2×80	0

SOLIDS EQUIPMENT EFFICIENCY

	Overflow (ppg)	Underflow (ppg)	Output Gal/Min.
Desander			
Desilter			

Product	Starting Inventory	Received	Used Last 24 Hours	Closing Inventory	Unit Cost	Cost
POLYSAL	24		5		42.88	214.40
CAUSTIC SODA	32		2		28.88	57.76
BARYTES	378		18		9.60	172.80
						444.96

SOLIDS ANALYSIS

	lb/bbl	%
Barite	—	—
Bentonite	13	1.4
Drill Solids	63	7.0
LGS	77	8.4
Salt	1	Tr
N =	.62	
K =	.32	

BIT/HYD. PRESS. DATA

Jet Velocity	244
Impact Force	331
HHP	83
HSI	1.4
Bit Press Loss	500
CSG Seat Frac Press	
EMW @ CSG Seat	12.6+
ECD @ Bottom	

DAILY COST $444.96 | CUMULATIVE COST $36,435.67

I.D.F.S. ENGINEER: ANDREJ SKUJINS | HOME ADDRESS: ADELAIDE | TELEPHONE: 08-795102

APPENDIX C

APPENDIX C

LITHOLOGICAL DESCRIPTIONS

MINORA RESOURCES N.L. WINDERMERE #2 - LITHOLOGICAL DESCRIPTIONS.

350	100	MARL, light to medium greenish-grey, cream to light brown fossil fragments, soft to firm.
360	100	MARL, a.a. - very fossiliferous in part and grading to argillaceous limestone
370	40	SANDSTONE, dark brown, fine to coarse, mostly fine to medium, poor to moderate sorted, well rounded, polished/glazed surface, loose, poor porosity? Also white to light grey-green, very fine, silty, moderate sorted, sub-angular to sub-rounded, trace glauconitic, clay matrix (10%), lithic (30%), firm, poor porosity.
	10	SILCRETE/WEATHERED VOLCANICS? white to cream, very hard, grey and brown lithic grains.
	50	MARL, a.a.
	Tr	CLAYSTONE, yellow, silty, soft to firm.
380	20	SANDSTONE, a.a.
	40	CLAYSTONE, greyish blue-green, soft to firm, occasional silty.
	40	MARL, a.a. - fossiliferous and grading to argillaceous limestone in part.
390	10	SANDSTONE, a.a.
	10	CLAYSTONE, a.a.
	80	MARL, a.a. - white, cream, grey-green.
400	60	SANDSTONE, cream, brown, grey, very fine to fine, moderate sorted, sub-angular, silty clay matrix (15%), trace glauconite, lithic (30%), calcareous cement (5%), soft to firm, poor porosity.
	20	CLAYSTONE, a.a.
	20	MARL, a.a.
410	60	SANDSTONE, a.a. - also clear, loose, coarse to very coarse, moderate sorted, well rounded, good apparent porosity.
	20	CLAYSTONE, a.a.
	20	MARL, a.a. - trace to 5% glauconite.
	Tr	PYRITE, coarse nodules/aggregates of fine crystals.
420	80	SANDSTONE, clear, light to medium brown, medium to very coarse, moderate sorted, sub-rounded to rounded, loose, good porosity.
	10	CLAYSTONE, a.a.
	10	MARL, a.a.
	Tr	PYRITE, a.a.
430	100	SANDSTONE, clear, some light brown, medium to very coarse, mostly medium to coarse, moderate to well sorted, sub-angular to rounded, loose, good porosity.
	Tr	PYRITE, a.a.
440	100	SANDSTONE, a.a.
450	100	SANDSTONE, a.a.
460	50	SANDSTONE, a.a.
	50	CLAYSTONE, brown, soft, dispersive.
470	50	SANDSTONE, a.a.
	50	CLAYSTONE, brown, soft, dispersive, sand grains.
480	100	SANDSTONE, clear, medium to coarse, moderate to well sorted, sub-angular to rounded, loose quartz grains, good porosity.

490	100	SANDSTONE, a.a. - trace pyrite.
500	70	SANDSTONE, a.a.
	30	CLAYSTONE, dark brown, greyish-brown, soft, dispersive, sandy.
510	100	SANDSTONE, a.a.
	Tr	CLAYSTONE, a.a.
520	80	SANDSTONE, a.a. - trace mica.
	20	CLAYSTONE, a.a.
530	80	SANDSTONE, a.a.
	20	CLAYSTONE, a.a.
540	100	SANDSTONE, a.a.
	Tr	CLAYSTONE, a.a.
550	80	SANDSTONE, a.a.
	20	CLAYSTONE, a.a.
560	50	SANDSTONE, a.a.
	50	CLAYSTONE, a.a.
570	100	SANDSTONE, a.a.
	Tr	CLAYSTONE, a.a.
580	100	SANDSTONE, a.a.
	Tr	CLAYSTONE, a.a.
590	100	SANDSTONE, a.a.
	Tr	CLAYSTONE, a.a.
600	100	SANDSTONE, a.a.
	Tr	CLAYSTONE, a.a.
610	100	SANDSTONE, a.a. - sub-angular to sub-rounded.
	Tr	CLAYSTONE, a.a.
620	100	SANDSTONE, a.a.
	Tr	CLAYSTONE, a.a.
630	100	SANDSTONE, a.a.
	Tr	CLAYSTONE, a.a.
640	100	SANDSTONE, a.a.
	Tr	CLAYSTONE, a.a.
650	70	SANDSTONE, a.a.
	30	CLAYSTONE, a.a.
660	90	SANDSTONE, clear, medium to coarse, some very coarse, moderate sorted, sub-angular to sub-rounded, loose quartz grains, trace pyrite, good porosity.
	10	CLAYSTONE, dark brown, grey-brown, soft, dispersive, silty in part.
670	90	SANDSTONE, a.a. - trace pyrite (<5%)
	10	CLAYSTONE, a.a.

680	30	SANDSTONE, a.a.
	20	CLAYSTONE, blue-grey, soft, grading to marl, also brownish-black, carbonaceous, silty
	50	MARL, greenish-grey to pale blue-green, fossiliferous, soft.
690	30	SANDSTONE, a.a.
	30	CLAYSTONE, a.a.
	40	MARL, a.a.
700	20	SANDSTONE, a.a.
	40	SILTSTONE, brownish-black, argillaceous and carbonaceous, pyritic in part, soft to firm.
	40	MARL, a.a.
	Tr	PYRITE, crystalline nodules/aggregates.
710	10	SANDSTONE, a.a.
	50	SILTSTONE, a.a. - grades to silty claystone.
	40	MARL, a.a.
720	70	SANDSTONE, clear to dark yellowish-orange, (honey brown), some moderate brown to dusky brown, fine to very coarse, mostly medium to coarse, poor to moderate sorted, sub-angular to rounded, loose iron stained quartz grains, minor lithic grains (10%), rare pyrite, good porosity.
	10	SILTSTONE, a.a.
	20	MARL; a.a.
730	100	SANDSTONE, a.a. - coarse to very coarse, olive-brown lithic grains (10%).
	Tr	MARL, a.a.
740	100	SANDSTONE, a.a. - fine to very coarse, mostly coarse to very coarse.
750	100	SANDSTONE, a.a. - trace brown clay matrix.
760	100	SANDSTONE, a.a.
770	100	SANDSTONE, a.a. - trace pyrite.
780	100	SANDSTONE, a.a.
	Tr	SILTSTONE, olive-grey, firm to hard.
790	100	SANDSTONE, a.a.
	Tr	SILTSTONE, a.a.
800	100	SANDSTONE, a.a. - mostly coarse to very coarse, common pyrite (5%).
810	100	SANDSTONE, a.a. - pyrite (5%).
820	80	SANDSTONE, a.a.
	20	SILTSTONE, medium grey, carbonaceous and pyritic in part, firm.
830	50	SANDSTONE, a.a.
	50	SILTSTONE, a.a. - sandy in part with coarse quartz grains.
840	70	SANDSTONE, a.a. - pyrite (5%).
	30	SILTSTONE, a.a.
850	20	SANDSTONE, a.a.
	80	CLAYSTONE, dark grey, silty, carbonaceous in part, sticky.

860	20	SANDSTONE, a.a.
	80	CLAYSTONE, a.a.
	Tr	PYRITE, a.a.
870	10	SANDSTONE, a.a.
	90	CLAYSTONE, a.a.
880	20	SANDSTONE, a.a.
	80	CLAYSTONE, a.a.
890	20	SANDSTONE, clear, fine to coarse, poor to moderate sorted, sub-angular to rounded, loose quartz grains, good apparent porosity.
	80	CLAYSTONE, a.a. - with abundant fine to coarse quartz grains.
900	30	SANDSTONE, a.a.
	70	CLAYSTONE, a.a.
910	20	SANDSTONE, clear, fine to coarse, poorly sorted, sub-angular to rounded, loose quartz grains, minor brown-black lithic grains (5%), good apparent porosity.
	80	CLAYSTONE, olive grey, slightly calcareous, fossiliferous in part, soft, sandy in part.
	Tr	PYRITE, a.a.
920	20	SANDSTONE, a.a. - also pale yellow-orange (5%).
	80	CLAYSTONE, a.a.
930	30	SANDSTONE, a.a.
	70	CLAYSTONE, a.a.
940	20	SANDSTONE, a.a. - also minor white to light grey, very fine, moderate sorted, sub-rounded, trace glauconite, hard, dolomitic? poor porosity.
	80	CLAYSTONE, a.a.
950	20	SANDSTONE, a.a.
	80	CLAYSTONE, a.a.
960	20	SANDSTONE, a.a.
	80	CLAYSTONE, medium dark grey to brownish-grey, silty, trace glauconite, sandy in part.
970	Tr	SANDSTONE, a.a.
	100	CLAYSTONE, medium dark grey to brownish-grey, silty and sandy, trace glauconite, soft.
980	100	CLAYSTONE, a.a.
990	100	CLAYSTONE, a.a.
1000	100	CLAYSTONE, light olive-grey, silty and sandy with greenish-black glauconite pellets (5%).
1010	100	CLAYSTONE, a.a. - 5-10% glauconite.
1020	Tr	SANDSTONE, clear, medium to coarse, loose, quartz grains.
	100	CLAYSTONE, a.a. - 10% glauconite, trace pyrite (<1%).

1030	Tr	SANDSTONE, a.a.
	100	CLAYSTONE, yellowish-grey to medium dark grey, silty and sandy, greenish-black glauconite pellets (10%), trace pyrite and carbonaceous material.
1040	Tr	SANDSTONE, a.a.
	100	CLAYSTONE, a.a.
1050	40	SANDSTONE, clear, white, greenish-grey, very fine to medium, moderate sorted, sub-angular to sub-rounded, loose quartz grains, greenish-grey lithic / quartzite grains (20%), white feldspar (5%), glauconite (10%), soft, poor porosity.
	60	CLAYSTONE, a.a. - trace pyrite (<1%).
1060	30	SANDSTONE, a.a. - trace mica (<1%).
	70	CLAYSTONE, a.a.
1070	30	SANDSTONE, a.a. - trace glauconite (<5%).
	70	CLAYSTONE, a.a.
1080	50	SANDSTONE, a.a.
	50	CLAYSTONE, a.a.
1090	30	SANDSTONE, a.a.
	70	CLAYSTONE, a.a. - white to light grey.
1100	50	SANDSTONE, a.a.
	50	CLAYSTONE, a.a.
1110	40	SANDSTONE, a.a.
	60	CLAYSTONE, a.a.
1120	30	SANDSTONE, a.a.
	70	CLAYSTONE, a.a.
1130	30	SANDSTONE, a.a.
	70	CLAYSTONE, a.a.
1140	80	SANDSTONE, clear, white, pale green to grey-green, fine to medium, moderate sorted, sub-rounded quartz grains and lithic / quartzite grains (30%), poor to fair porosity.
	20	CLAYSTONE, white to light grey, sandy, soft, trace pyrite.
1150	50	SANDSTONE, a.a.
	50	CLAYSTONE, a.a. - light grey, pinkish-grey.
1160	50	SANDSTONE, a.a. - mostly loose, but some aggregates with abundant clay matrix, poor porosity.
	50	CLAYSTONE, a.a.
1170	20	SANDSTONE, a.a.
	80	CLAYSTONE, a.a.
1180	10	SANDSTONE, a.a.
	90	CLAYSTONE, white, light grey to light greenish-grey, silty and sandy, trace glauconite? soft.

1190	40	SANDSTONE, white to light grey, very fine to fine, poor to moderate sorted, sub-angular to sub-rounded, clay matrix (5%), strong calcareous cement (10%), grey-black and grey-green lithic / quartzite grains (20%), white feldspar (10%), hard, poor porosity.
	60	CLAYSTONE, a.a.
1200	100	CLAYSTONE, light to dark grey, glauconitic, sandy in part.
1210	100	CLAYSTONE, a.a.
1220	10	SILTSTONE, light to dark grey, trace glauconite, very argillaceous - grading to silty claystone, soft to firm.
	90	CLAYSTONE, a.a. - trace plant fragments.
1230	40	SANDSTONE, clear, fine to coarse, mostly fine to medium, poorly sorted, sub-angular to rounded, grey-black and grey-green lithic / quartzite grains (30%), loose, poor to fair porosity.
	20	SILTSTONE, a.a.
	40	CLAYSTONE, a.a. - trace pyrite.
1240	40	SANDSTONE, a.a.
	20	SILTSTONE, a.a.
	40	CLAYSTONE, a.a. - trace carbonaceous (plant) fragments.
1250	40	SANDSTONE, a.a.
	20	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
1260	30	SANDSTONE, a.a. - minor (20%), white to light grey, fine to coarse, angular to sub-rounded, poorly sorted, strong calcareous cement (20%), very poor porosity.
	30	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
	Tr	COAL, dull brown-black, lignitic.
1270	20	SANDSTONE, white to light grey, very fine to medium, mostly very fine to fine, angular to sub-rounded, moderate sorted, lithic / quartzite grains (15%), pink and white feldspar (10%), strong calcareous cement (15%), hard, very poor porosity.
	30	SILTSTONE, white to light grey, greenish-grey, carbonaceous material (10%), firm.
	50	CLAYSTONE, a.a.
1280	20	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	50	CLAYSTONE, a.a. - grades to siltstone.
1290	30	SANDSTONE, a.a. - minor pyrite (5%).
	20	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.
1300	30	SANDSTONE, a.a. - minor pyrite (5%).
	20	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.

1310	60	SANDSTONE, clear, white, pale blue-green, dark green to grey-green, fine to coarse, mostly medium, moderate sorted, sub-rounded, lithic / quartzite grains (20%), feldspar (5%), trace pyrite (<1%), calcareous cement in part (15%), mostly loose, poor porosity.
	20	SILTSTONE, white to light grey, trace carbonaceous material (<5%), grades to claystone.
	20	CLAYSTONE, a.a.
1320	30	SANDSTONE, a.a.
	30	SILTSTONE, a.a. - firm to hard.
	40	CLAYSTONE, a.a. - soft to firm.
1330	20	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
1340	10	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.
1350	10	SANDSTONE, white, pale blue-green, grey-black, very fine to medium, mostly fine to medium, poor to moderate sorted, sub-angular to sub-rounded, lithic grains (20%), moderate to strong calcareous cement (15%), hard, poor porosity.
	40	SILTSTONE, light to medium grey, grey-brown, carbonaceous (5%), firm to hard, grading to claystone.
	50	CLAYSTONE, light grey, silty, trace carbonaceous material and pyrite, soft to firm.
1360	10	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.
1370	10	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.
1380	20	SANDSTONE, white, very fine to medium, mostly fine, moderate sorted, sub-angular to sub-rounded, medium grey to grey-black lithic / quartzite grains (15%), trace mica, calcareous cement (10%), poor porosity.
	30	SILTSTONE, light to medium grey, lithic, micaceous, carbonaceous, feldspathic, calcareous in part, firm to hard.
	50	CLAYSTONE, light grey, greenish-grey, silty, soft to firm, trace pyrite.
1390	10	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.
1400	10	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
1410	10	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
1420	Tr	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	70	CLAYSTONE, a.a.

1430	10	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
1440	10	SANDSTONE, a.a. - trace pyrite.
	30	SILTSTONE, white, light grey, light greenish-grey, carbonaceous (<5%), micaceous (<5%), lithic (<5%), argillaceous and grading to claystone in part, calcareous in part, firm to hard.
	60	CLAYSTONE, light to medium grey, light olive grey, silty, soft to firm.
1450	10	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
1460	10	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.
1470	Tr	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	70	CLAYSTONE, a.a.
1480	Tr	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	70	CLAYSTONE, a.a.
1490	Tr	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	70	CLAYSTONE, a.a.
1500	10	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
1510	10	SANDSTONE, white, light grey, grey-green, very fine to occasional medium, poor to moderate sorted, sub-angular to sub-rounded, grey-green and grey-black lithic grains (20%), feldspar (<5%), hard, calcareous cement (15%), poor porosity.
	40	SILTSTONE, light to medium grey, grey-green, lithic, feldspathic, trace carbonaceous material, calcareous, grades to very fine sandstone, hard.
	50	CLAYSTONE, white, light to medium grey, grey-green, silty, soft to firm.
1520	10	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.
	Tr	COAL & PYRITE, a.a.
1530	Tr	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	70	CLAYSTONE, a.a.
1540	Tr	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	70	CLAYSTONE, a.a.
1550	Tr	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	70	CLAYSTONE, a.a.

1560	10	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
1570	Tr	SANDSTONE, a.a.
	30	SILTSTONE, white to light grey, light greenish-grey, lithic, feldspathic, calcareous in part, carbonaceous in part, trace pyrite, firm to hard.
	70	CLAYSTONE, white, light greenish-grey, light brownish-grey, silty, soft to firm.
1580	Tr	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	70	CLAYSTONE, a.a.
1590	Tr	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	70	CLAYSTONE, a.a.
1600	10	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.
1610	10	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.
1620	20	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.
1630	10	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
1640	20	SANDSTONE, white, light grey, very fine to medium, occasional coarse, moderate sorted, sub-angular to sub-rounded, lithic (25%), feldspar (5%), trace pyrite, calcareous cement (15%), hard, poor porosity.
	40	SILTSTONE, a.a. - grades to very fine sandstone.
	40	CLAYSTONE, a.a.
1650	20	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
1660	20	SANDSTONE, a.a. - but becoming more quartzose with fine to coarse, loose, sub-angular to sub-rounded, clear quartz grains (25%).
	40	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
1670	20	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
1680	30	SANDSTONE, clear, white, pale grey-green, loose and aggregates, very fine to coarse, mostly very fine to fine, moderate sorted, sub-rounded, pale green, grey-green and grey-black lithic grains (20%), minor feldspathic (5%), trace mica and pyrite, calcareous cement (15%), poor porosity.
	20	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.

1690	30	SANDSTONE, a.a.
	20	SILTSTONE, a.a.
	50	CLAYSTONE, a.a.
	Tr	COAL, a.a.
1700	70	SANDSTONE, clear, white, pale green, grey-green, grey-black, mostly loose, some aggregates, poor to moderate sorted, sub-rounded, lithic / quartzite grains (30%), feldspathic (5%), trace pyrite and biotite, calcite cement is 15% of aggregates, poor porosity.
	30	CLAYSTONE, a.a. - silty.
1710	30	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	30	CLAYSTONE, a.a.
1720	40	SANDSTONE, a.a. - grades to siltstone in part.
	20	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
1725	40	SANDSTONE, a.a.
	20	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
		<u>TRACE (<1%) DULL YELLOW SPOTTY FLUORESCENCE - NO CUT.</u>
1730	60	SANDSTONE, a.a.
	10	SILTSTONE, a.a.
	30	CLAYSTONE, a.a.
		<u>TRACE FLUORESCENCE - a.a.</u>
1735	60	SANDSTONE, a.a.
	10	SILTSTONE, a.a.
	30	CLAYSTONE, a.a.
1740	70	SANDSTONE, clear, white, greyish-green, grey-black, very fine to coarse, mostly fine to medium, sub-angular to sub-rounded, occasional rounded, mostly loose, some aggregates, grey-green lithic grains (30%), feldspar (5%), clay matrix (5%), calcareous cement (15%), trace pyrite, firm, poor porosity. Occasional dark yellow-brown, "glazed" ironstone grains and rare fossil fragments? - caving.
	10	SILTSTONE, a.a.
	20	CLAYSTONE, a.a.
		<u>TRACE (<1%) DULL YELLOW SPOTTY FLUORESCENCE - NO CUT.</u>
		CORE *1 : 1743.8 - 1749.3 m. Recovered 78%.
1755	60	SANDSTONE, a.a.
	40	CLAYSTONE, a.a. - high percentage of cavings - fossils, glauconite etc.
1760	10	SANDSTONE, a.a.
	30	SILTSTONE, white, medium grey, very argillaceous, grades to claystone, trace carbonaceous material.
	60	CLAYSTONE, a.a. - trace carbonaceous material.
1765	10	SANDSTONE, a.a.
	20	SILTSTONE, a.a.
	70	CLAYSTONE, a.a.

1770	50	SANDSTONE, a.a.
	10	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
		10-15% VERY DULL YELLOW-ORANGE MINERAL? FLUORESCENCE - NO CUT. RARE SPECKS OF DIM TO BRIGHT BLUE-WHITE FLUORESCENCE WITH AN INSTANT CRUSH CUT AND THIN TO MODERATE RING RESIDUE.
		CORE #1 : 1777.0 - 1793.9 m. Recovered 98%.
1800	40	SANDSTONE, white to very light grey, very fine to fine, moderate sorted sub-angular to sub-rounded, lithic (20%), abundant clay matrix, grades to sandy claystone.
	60	CLAYSTONE, light to medium grey, grey-brown, very dispersive, sandy.
		DST #1 : 1775.2 - 1802.3 m. RECOVERED 299 m. MUD, MUDDY WATER & SLIGHTLY GAS CUT WATER (Rw = 0.3 @ 20C).
1805	30	SANDSTONE, clear, white, very fine to medium, moderate sorted, sub-angular to sub-rounded, mostly loose, some aggregates, lithic (15%), clay matrix (10%), calcareous in part (10%), poor porosity.
	70	CLAYSTONE, white to light grey, soft, silty and sandy, grades to very argillaceous siltstone in part.
	Tr	COAL/LIGNITE, dull brown to black.
1810	30	SANDSTONE, white to greenish-grey, very fine to fine, moderate to well sorted, sub-rounded, lithic (15%), hard, strong calcareous cement (15%), poor porosity.
	70	CLAYSTONE, a.a.
	Tr	COAL/LIGNITE, a.a.
1815	40	SANDSTONE, a.a.
	30	SILTSTONE, light to medium grey, grey-green, brownish-grey, carbonaceous and lignitic in part, firm to hard.
	30	CLAYSTONE, a.a.
	Tr	COAL/LIGNITE, a.a.
1820	20	SANDSTONE, a.a. - some medium to coarse, loose, quartz grains.
	40	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
1825	20	SANDSTONE, a.a.
	10	SILTSTONE, a.a. - calcareous in part and grades to very fine sandstone.
	70	CLAYSTONE, dark greenish-grey to dark grey, minor (20%) light greenish-grey, silty in part, soft to mostly firm.
1830	20	SANDSTONE, a.a.
	20	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
1835	20	SANDSTONE, a.a.
	10	SILTSTONE, a.a.
	70	CLAYSTONE, a.a.
1840	30	SANDSTONE, a.a.
	10	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.

1845	30	SANDSTONE, a.a.
	10	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
1850	30	SANDSTONE, a.a.
	10	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
1855	20	SANDSTONE, white, light grey, very fine to fine, moderate sorted, sub-rounded, lithic (25%), feldspar (5%), trace mica, strong calcareous cement (15%), very poor porosity.
	20	SILTSTONE, light grey, lithic, micaceous, sandy and calcareous in part, hard.
	60	CLAYSTONE, light to dark grey, silty in part, trace carbonaceous fragments, firm.
1860	30	SANDSTONE, a.a.
	10	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
1865	30	SANDSTONE, a.a.
	10	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
1869	20	SANDSTONE, a.a.
	20	SILTSTONE, a.a.
	60	CLAYSTONE, a.a.
		<u>RUN GEARHART OPEN HOLE WIRELINE LOGS : DLL/MSFL/GR & BHCS/GR/MEL.</u>
		<u>RUN 9-5/8" CASING & CEMENT AT 1867 m.</u>
1875	30	SILTSTONE, light grey, light olive-grey, carbonaceous specks, very argillaceous and grades to silty claystone, firm.
	70	CLAYSTONE, very light to light grey, light olive-grey, greenish-grey, silty, firm.
	Tr	COAL, dull black, lignitic.
1880	30	SILTSTONE, a.a.
	70	CLAYSTONE, a.a.
	Tr	COAL, a.a.
1885	40	SANDSTONE, clear, white to very light grey, very fine, moderate sorted, sub-angular to sub-rounded, grey-brown to black lithic grains (30%), feldspar (10%), strong calcareous cement (15%), very poor porosity.
	20	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
1890	10	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
	20	COAL / LIGNITE, dark brown to black, very carbonaceous, sub-fissile.
1895	10	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	40	CLAYSTONE, a.a.
	10	COAL / LIGNITE, a.a.
1900	30	SANDSTONE, a.a. - grades to calcareous siltstone.
	40	SILTSTONE, a.a.
	30	CLAYSTONE, a.a.
	Tr	COAL / LIGNITE, a.a.

1950	40	SANDSTONE, a.a.
	40	SILTSTONE, a.a. - dark green to black glauconite nodules (1%).
	20	CLAYSTONE, a.a.
	Tr	SHALE/COAL, dark brown-black, lignitic.
1955	30	SANDSTONE, a.a. - grades to siltstone
	60	SILTSTONE, white to yellowish-grey, light brownish-grey, olive-brown, light grey, lithic/volcanic grains, trace carbonaceous material, rare dark green to black glauconite nodules
	10	SHALE, dark brown to black, lignitic.
	Tr	TUFF/VOLCANICS, a.a.
1960	30	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	TUFF, white to very pale orange, very fine-cryptocrystalline, trace brown mica.
1965	30	SANDSTONE, a.a.
	40	SILTSTONE, very light grey to light olive grey, greenish grey, lithic/volcanic grains, trace mica, calcareous.
	20	SHALE, brownish grey to brownish black, very carbonaceous.
	10	TUFF, a.a.
1970	20	SANDSTONE, a.a. - calcareous.
	80	SILTSTONE, a.a.
	Tr	GLAUCONITE, dark green nodules : 1-2%.
	Tr	TUFF, a.a. - (<1%).
1975	20	SANDSTONE, white to very light grey, silty to very fine, moderate sorted, calcareous cement (10%), lithic (10%), feldspathic (5%), micaceous (5%), hard, poor porosity.
	80	SILTSTONE, white to light olive-grey, lithic, micaceous, calcareous in part, grades to very fine sandstone.
	Tr	GLAUCONITE, dark green nodules : 1-2%.
	Tr	TUFF, a.a. - (<1%).
1980	10	SANDSTONE, a.a. - calcareous.
	90	SILTSTONE, a.a.
	Tr	COAL, a.a.
1985	20	SANDSTONE, a.a. - calcareous.
	80	SILTSTONE, a.a.
	Tr	COAL, a.a.
1990	20	SANDSTONE, a.a. - calcareous.
	80	SILTSTONE, a.a.
1995	20	SANDSTONE, a.a. - calcareous.
	80	SILTSTONE, a.a.
2000	20	SANDSTONE, a.a. - moderate to strong calcareous cement.
	80	SILTSTONE, a.a.

1905	20	SANDSTONE, a.a.
	40	SILTSTONE/VOLCANICS, medium light grey to olive grey, hard, black "pepper" lithic/volcanic grains, hard, minor (<1%) coarse quartz grains cemented in siltstone.
	40	CLAYSTONE, a.a.
	Tr	BASALT/DOLERITE? dark green to black, firm to hard
1910	20	SANDSTONE, a.a.
	50	SILTSTONE/VOLCANICS, a.a.
	30	CLAYSTONE, a.a.
	Tr	BASALT, a.a.
1915	80	SILTSTONE/VOLCANICS, a.a.
	20	CLAYSTONE, a.a.
1920	60	SILTSTONE, a.a. - volcanogenic, minor coarse quartz grains and medium to dark green to black basalt? fragments, hard.
	40	CLAYSTONE, white to yellowish grey, soft, weathered, silty in part. Possibly weathered volcanics or siltstone.
	Tr	COAL, a.a.
1925	30	SANDSTONE, mostly white, very fine, moderate sorted, sub-rounded, silty, calcareous cement (10%), lithic (10%), feldspathic (10%), trace brown mica, poor porosity.
	50	SILTSTONE, a.a. - also white, light grey, sandy, calcareous in part, tuffaceous? glauconitic.
	20	CLAYSTONE, a.a. - grades to siltstone.
1930	40	SANDSTONE, mostly white, very fine, moderate sorted, sub-rounded, silty, calcareous cement (10%), lithic (10%), feldspathic (10%), trace brown mica, poor porosity.
	40	SILTSTONE, a.a. - also white, light grey, sandy, calcareous in part, tuffaceous? glauconitic.
	20	CLAYSTONE, a.a. - grades to siltstone.
	Tr	SHALE/COAL, dark brown to black, carbonaceous.
	Tr	TUFF/VOLCANICS, white to brown, firm.
1935	30	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	20	CLAYSTONE, a.a.
	10	SHALE/COAL, a.a.
1940	40	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	20	CLAYSTONE, a.a.
	Tr	TUFF/VOLCANICS, a.a.
1945	30	SANDSTONE, white, cream, light grey, very fine, moderate sorted, calcareous in part, minor (5%) grey-black and orange lithic/volcanic grains, very poor porosity.
	40	SILTSTONE, white to yellowish-grey, hard, brown-black lithic/volcanic grains, calcareous in part, also 50% light to medium grey, light brown, greenish-grey, hard.
	30	CLAYSTONE, light brownish-grey, light to medium grey, silty, firm to hard.
	Tr	SHALE, carbonaceous, grading to coal.

2005	20	SANDSTONE, white to yellowish-grey, silty to very fine, moderate sorted, moderate to strong calcareous cement (10%), lithics (10%), feldspathic (10%), micaceous (5%), very poor porosity, grades to siltstone.
	80	SILTSTONE, white to light grey, lithic, feldspathic, micaceous, calcareous, tuffaceous, minor carbonaceous fragments, firm to hard.
	Tr	TUFF, white to yellow-grey, micaceous.
2010	20	SANDSTONE, a.a
	80	SILTSTONE, white, very light grey to medium grey, greenish-grey, micaceous, feldspathic, lithic, tuffaceous, minor carbonaceous fragments.
	Tr	SHALE, dark brownish-grey to black, very carbonaceous.
	Tr	TUFF, a.a.
2015	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a
	Tr	SHALE, a.a.
2020	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a.
	Tr	SHALE, a.a.
2025	10	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	10	SHALE/COAL, a.a.
	Tr	GLAUCONITE, dark green rounded nodules.
2030	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	Tr	SHALE/COAL, a.a.
	Tr	GLAUCONITE, a.a.
2035	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	Tr	GLAUCONITE, a.a. - (1%).
2040	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	Tr	SHALE/COAL, a.a.
2045	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	Tr	SHALE/COAL, a.a.
2050	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	20	CLAYSTONE, white, silty, soft.
	Tr	SHALE/COAL, a.a.
2055	20	SANDSTONE, white, light grey, light pinkish-grey, very fine, grades to siltstone, moderate sorted, calcareous cement (10%), lithic/volcanic grains (10%), feldspar (5%), trace mica, poor porosity.
	70	SILTSTONE, white, light grey, light olive-grey, greenish-grey, lithic/volcanic grains, feldspathic, minor mica, calcareous in part, firm to hard.
	10	SHALE, brownish-grey to brownish-black, lignitic, grading to coal.

2060	10	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	SHALE, a.a.
	Tr	TUFF, a.a.
2065	20	SANDSTONE, a.a. - very calcareous (15-20%), very poor porosity.
	80	SILTSTONE, a.a.
2070	Tr	SANDSTONE, a.a.
	100	SILTSTONE, light brownish-grey, light olive-grey, greenish-grey, light grey, lithic, feldspathic, micaceous, calcareous in part.
2075	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2080	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a.
2085	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a. - 25% light brown, very calcareous.
2090	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	20	SHALE, greenish-brown to black, very carbonaceous.
2095	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a.
	Tr	TUFF, white, soft, trace biotite.
2100	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a.
	Tr	TUFF, a.a.
2105	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	Tr	TUFF, a.a.
2110	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2115	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2120	100	SILTSTONE, pale olive to light grey, firm to hard, lithic, feldspathic, micaceous, trace carbonaceous material.
2125	10	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
2130	40	SANDSTONE, clear, white, very fine, grades to siltstone, moderate sorted, sub-angular, minor calcareous cement (5%), lithic (10%), feldspathic (5%), trace mica, poor porosity.
	60	SILTSTONE, a.a. - grades to very fine sandstone.

2135	50	SANDSTONE, clear, white, light grey, greenish-grey, silty to very fine, moderate sorted, sub-angular, calcareous cement (10%), lithic/volcanic grains (15%), feldspar (5%), trace mica, poor porosity.
	50	SILTSTONE, white, pinkish-grey, light grey, sandy, lithic, feldspathic, micaceous, calcareous in part, grades to very fine sandstone.
2140	30	SANDSTONE, a.a
	60	SILTSTONE, a.a.
	10	SHALE, brownish-grey to black, very carbonaceous, grading to coal
2145	100	SILTSTONE, white, very light grey, light olive-grey, lithic/volcanic grains, sandy in part, firm to hard.
	Tr	TUFF, a.a.
2150	Tr	SANDSTONE, a.a.
	100	SILTSTONE, a.a.
	Tr	TUFF, a.a.
2155	30	SANDSTONE, white, greenish-grey, very fine, moderate sorted, calcareous cement (10%), lithic/volcanic grains (15%), feldspar (5%), poor porosity.
	70	SILTSTONE, a.a.
2160	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, dark brown to black, very carbonaceous.
	Tr	TUFF, a.a.
2165	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE/COAL, dark grey, dark brown to black, very carbonaceous, lignitic.
2170	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a. - slightly calcareous.
	10	SHALE/COAL, a.a.
2175	30	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	20	SHALE, brownish-grey, carbonaceous, firm to hard.
2180	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	Tr	COAL, a.a.
2185	20	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
2190	Tr	SANDSTONE, a.a. - calcareous.
	100	SILTSTONE, light to dark grey, brownish-grey, lithic, carbonaceous, grades to very fine sandstone.
	Tr	SHALE, a.a.
	Tr	TUFF, white, soft, trace mica.
2195	90	SANDSTONE, a.a.
	10	SILTSTONE, a.a.

2200	10	SANDSTONE, a.a. - slightly calcareous.
	60	SILTSTONE, a.a.
	30	SHALE, dark brownish-grey, carbonaceous.
	Tr	TUFF, a.a.
2205	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a
	Tr	SHALE, a.a
2210	80	SANDSTONE, a.a.
	20	SILTSTONE, a.a.
	Tr	TUFF, a.a.
2215	80	SILTSTONE, a.a.
	20	SHALE, a.a. - grades to lignite.
2220	80	SILTSTONE, a.a.
	20	SHALE, a.a.
	Tr	TUFF, a.a.
2225	80	SILTSTONE, a.a.
	20	SHALE, a.a.
2230	10	SANDSTONE, a.a.
	90	SILTSTONE, brownish-grey, greenish-grey, micaceous, carbonaceous, sandy in part.
2235	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a.
	Tr	SHALE, a.a.
2240	10	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	10	SHALE, a.a.
2245	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a.
2250	40	SANDSTONE, white, very light grey, very fine, moderate sorted, sub-angular, moderate clay matrix (5%), calcareous cement (5-10%), grey and grey-green lithic/volcanic grains (10%), feldspar (10%), trace mica, poor porosity.
	60	SILTSTONE, a.a.
2255	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	Tr	SHALE, a.a.
	Tr	COAL, a.a.
2260	Tr	SANDSTONE, a.a.
	100	SILTSTONE, white to medium grey, light brownish-grey, lithic, micaceous, feldspathic, minor carbonaceous specks, calcareous in part, firm, grades to very fine sandstone.
2265	Tr	SANDSTONE, a.a.
	100	SILTSTONE, a.a.
2270	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a.

2275	10	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	10	SHALE, brownish-grey to brownish-black, very carbonaceous, brittle, grades to coal.
2280	20	SANDSTONE, a.a
	80	SILTSTONE, a.a.
	Tr	SHALE, a.a
2285	20	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
2290	30	SANDSTONE, clear to white, very fine, poor to moderate sorted, sub-angular, medium calcareous cement (5-10%), grey-green and black lithic/volcanic grains (5-10%), white feldspar - weathered in part (10%), poor porosity.
	70	SILTSTONE, white, light to medium grey, greenish-grey, lithic, feldspathic, micaceous, trace to moderate carbonaceous material, firm, grades to very fine sandstone.
	Tr	SHALE, brownish-grey, carbonaceous in part, firm to hard.
2295	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2300	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	Tr	SHALE, a.a.
2305	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2310	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2315	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2320	20	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	20	SHALE, dark brown to black, grading to coal.
	10	COAL, shaley.
2325	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	Tr	COAL, a.a.
2330	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	Tr	COAL, a.a.
2335	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2340	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.

2345	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2350	10	SANDSTONE, white to light grey, silty to very fine, poor to moderate sorted, sub-angular, calcareous cement in part (10%), lithic/volcanic grains (10%), feldspar (5%), poor porosity
	90	SILTSTONE, a.a.
2355	10	SANDSTONE, a.a.
	90	SILTSTONE, light to medium grey, lithic, feldspathic, micaceous, calcareous in part, grades to very fine sandstone.
2360	Tr	SANDSTONE, a.a.
	100	SILTSTONE, light to medium grey, lithic, micaceous, feldspathic, carbonaceous, sandy in part.
2365	Tr	SANDSTONE, a.a.
	100	SILTSTONE, light to medium grey, occasional dark grey, sub-fissile, lithic, micaceous, feldspathic, carbonaceous fragments, sandy in part.
2370	Tr	SANDSTONE, a.a.
	100	SILTSTONE, a.a.
2375	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2380	Tr	SANDSTONE, a.a.
	90	SILTSTONE, a.a.
	10	SHALE, a.a.
2385	20	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
2390	30	SANDSTONE, white, light grey, very fine, poor to moderate sorted, sub-angular, moderate to strong calcareous cement (5-10%), lithic/volcanic grains (10%), feldspar (10%), poor porosity.
	70	SILTSTONE, a.a. - grades to very fine sandstone.
2395	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2400	10	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2405	10	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2410	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a.

2415	10	SANDSTONE, white, light grey, very fine, poor to moderate sorted, sub-angular to sub-rounded, calcareous cement (15%), lithic/volcanic grains (10-15%), feldspar (10%), firm, poor porosity.
	90	SILTSTONE, white, light brownish-grey, light olive-grey to greenish-grey, lithic/volcanic grains, feldspathic, trace mica, sub-fissile to blocky, firm to hard
2420	20	SANDSTONE, a.a
	80	SILTSTONE, a.a.
	Tr	SHALE, a.a.
	Tr	COAL, a.a.
2425	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	Tr	SHALE, a.a.
2430	30	SANDSTONE, white, light greenish-grey, very fine, moderate sorted, sub-angular, moderate to strong calcareous cement (10%), green and grey-black lithic/volcanic grains (15%), feldspar (10%), trace mica, firm, poor porosity.
	70	SILTSTONE, light to medium brownish-grey, lithic/volcanic grains, feldspathic, micaceous, calcareous in part, firm, grades to very fine sandstone.
	Tr	SHALE, brownish-grey, firm.
	Tr	COAL, a.a.
2435	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a.
2440	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	COAL, a.a.
2445	20	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	COAL, a.a.
2450	20	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	COAL, a.a.
2455	30	SANDSTONE, white, light greenish-grey, very fine, moderate sorted, sub-angular, calcareous cement (10%), lithic/volcanic grains (15%), feldspar (10%), firm, poor porosity.
	70	SILTSTONE, a.a.
2460	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2465	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2470	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2475	10	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	10	SHALE, brownish-grey to brownish-black, very carbonaceous, brittle, grades to coal.

2480	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2485	30	SANDSTONE, white, pinkish-grey, yellowish-grey, very fine, grades to siltstone, poor to moderate sorted, sub-angular, calcareous cement (10%), greenish-white lithic/volcanic grains (10%), pink and white feldspar (10%), firm, poor porosity.
	70	SILTSTONE, white, light grey, light olive-grey, brownish-grey, sandy, lithic/volcanic grains, feldspathic, trace carbonaceous material.
	Tr	COAL, a.a.
2490	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2495	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a.
2500	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	Tr	TUFF, a.a.
2505	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2510	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2515	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	Tr	SHALE, a.a.
2520	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2525	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2530	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2535	100	SANDSTONE, clear, white, loose, very fine to medium, predominantly fine, moderate sorted, sub-angular to sub-rounded, trace calcite grains and calcareous cement, grey, pale green and orange-pink lithic/quartzite/volcanic grains (20%), white feldspar (5%), trace to minor (1-2%), brown mica, poor to fair porosity.
	Tr	SILTSTONE, a.a.
2540	100	SANDSTONE, a.a. - becoming more angular, with increasing calcite grains and calcareous cement and more feldspar and mica.
2545	100	SANDSTONE, clear, white, minor pale green and pale orange-pink, very fine to occasional medium, mostly fine, poor to moderate sorted, angular to sub-angular, calcite grains and calcareous cement (5%), pale green and orange-pink lithic/quartzite/volcanic grains (20%), white and pinkish feldspar - weathered in part (10-15%), brown mica (<5%), poor porosity.
	Tr	SILTSTONE, a.a.
	Tr	SHALE, a.a.

2550	80	SANDSTONE, a.a. - but becoming very fine and silty with very poor porosity
	20	SILTSTONE, brownish-grey, lithic, feldspathic, micaceous, trace carbonaceous material, shaley in part.
2555	60	SANDSTONE, clear, white, very light grey, very fine, poor to moderate sorted, sub-angular, calcareous cement (10%), lithic/volcanic grains (20%), feldspar (10%), mica (5%), poor porosity.
	40	SILTSTONE, a.a.
2560	50	SANDSTONE, a.a. - minor yellow-brown, very calcareous.
	50	SILTSTONE, a.a.
2565	40	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	Tr	SHALE, a.a.
2570	10	SANDSTONE, a.a.
	70	SILTSTONE, white, pinkish-grey to yellowish-grey, lithic/volcanic, feldspathic, minor carbonaceous material, trace mica, firm.
	20	SHALE, light to medium brownish-grey, silty in part, firm.
	Tr	COAL, dull to bright black, shaley in part.
2575	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	20	SHALE, a.a.
2580	20	SANDSTONE, a.a. - one grain pink-red garnet.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
2585	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2590	40	SANDSTONE, white, very light grey, very pale orange, very fine, poor to moderate sorted, angular to sub-rounded, calcareous cement (10-15%), lithic/volcanic grains (15%), feldspar (10%), trace mica, poor porosity.
	60	SILTSTONE, a.a.
	Tr	COAL, a.a.
2595	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2600	30	SANDSTONE, clear, silty to very fine, poor to moderate sorted, sub-angular, calcareous cement (15%), lithic/volcanic grains (20%), feldspar (15%), trace mica, poor porosity.
	70	SILTSTONE, white, pale yellow-brown, light brownish-grey, sandy, calcareous in part, lithic/volcanic, feldspathic, trace mica.
	Tr	COAL, a.a.
2605	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	Tr	COAL, a.a.
2610	40	SANDSTONE, a.a. - grades to siltstone.
	60	SILTSTONE, a.a.
2612	100	coal, brownish-black, shaley in part.

2615	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2620	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	Tr	COAL, a.a.
2625	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	Tr	COAL, a.a.
2630	40	SANDSTONE, white, silty to very fine, poor to moderate sorted, sub-angular to sub-rounded, calcareous cement (15%), lithic/volcanic grains (20%), feldspathic (15%), trace mica, poor porosity.
	60	SILTSTONE, a.a.
2635	30	SANDSTONE, white, pinkish-grey, silty to very fine, poor to moderate sorted, sub-angular, moderate to strong calcareous cement(10%), lithic/volcanic grains (25%), feldspar (15%), trace mica, poor porosity.
	70	SILTSTONE, a.a. - white, grading to grades to very fine sandstone (20%), also light greenish-grey to olive-grey, brownish-grey, lithic/volcanic, feldspathic, carbonaceous in part, calcareous in part, firm.
2640	20	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, light to dark brownish-grey, carbonaceous, silty.
2645	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2650	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2655	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	Tr	COAL, a.a.
2660	60	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	Tr	COAL, a.a.
2665	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	Tr	COAL, a.a.
2670	30	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	SHALE, light to medium brown, olive-grey, silty in part, firm.
	10	COAL, dark brown to black, shaley in part.
2675	20	SANDSTONE, a.a.
	60	SILTSTONE, light brownish-grey, greenish-grey, lithic/volcanic, feldspathic, micaceous, carbonaceous in part, calcareous in part, firm.
	10	SHALE, a.a.
	10	COAL, a.a.

2680	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2685	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a
	20	SHALE, a.a.
	Tr	COAL, a.a.
2690	20	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	SHALE, a.a.
	20	COAL, a.a.
2695	10	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	20	SHALE, a.a.
	10	COAL, a.a.
2700	Tr	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	20	SHALE, a.a.
	10	COAL, a.a.
2705	Tr	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	20	SHALE, a.a.
	Tr	COAL, a.a.
NOTE :		SHALE SHAKER SCREENS TOO COARSE AND SOME SAND FALLING THROUGH.
2710	TR	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2715	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2720	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2725	Tr	SANDSTONE, a.a.
	60	SILTSTONE, light brownish-grey, lithic/volcanic, feldspathic, trace carbonaceous material, firm.
	10	SHALE, brownish-grey, silty, carbonaceous and grading to coal in part.
	10	COAL, brownish-black to black, dull to shiney lustre, brittle.
2730	10	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	30	SHALE, a.a.
	20	COAL, a.a.

2735	10	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	30	SHALE, a.a.
	20	COAL, a.a.
2740	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	20	SHALE, a.a.
	Tr	COAL, a.a.
2745	10	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	20	SHALE, a.a.
	10	COAL, a.a.
2750	20	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	20	SHALE, a.a.
	10	COAL, a.a.
2755	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2760	10	SANDSTONE, clear, white, very fine, moderate sorted, angular to sub-angular, calcareous cement (10%), lithic/volcanic grains (20%), feldspar (15%), trace mica, poor porosity.
	70	SILTSTONE, light to medium brownish-grey, light olive-grey, lithic, feldspathic, micro-micaceous, carbonaceous in part, firm, grades to shale.
	10	SHALE, brownish-grey, olive-grey, silty, carbonaceous in part, firm.
	10	COAL, a.a.
2765	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2770	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2775	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2780	10	SANDSTONE, white, silty to very fine, moderate sorted, sub-angular, calcite grains and cement (10%), lithic/volcanic grains (20%), feldspar (15%), trace mica and carbonaceous material, poor porosity.
	80	SILTSTONE, white, light grey, light brownish-grey, greenish-grey, lithic, feldspathic, micro-micaceous, carbonaceous in part,firm
	10	SHALE, dark brown to black, coally.
2785	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	20	SHALE, a.a.

2790	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	20	SHALE, a.a.
	Tr	COAL, a.a.
2795	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	20	SHALE, a.a.
	Tr	COAL, a.a.
2800	20	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	SHALE, a.a.
	20	COAL, a.a.
2805	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2810	10	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	20	SHALE, a.a.
	10	COAL, a.a.
2815	20	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
	Tr	COAL, a.a.
2820	30	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	20	SHALE, a.a.
	10	COAL, a.a.
2825	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	Tr	SHALE, a.a.
2830	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
NOTE :		FINER SHAKER SCREENS INSTALLED.
2835	30	SANDSTONE, a.a. - grades to siltstone.
	70	SILTSTONE, a.a.
2840	40	SANDSTONE, a.a. clear, white pale grey-green, very fine, moderate sorted, sub-angular, calcareous cement (10%), lithic/volcanic grains (15%), feldspar (10%), poor porosity.
	60	SILTSTONE, a.a.

2845	20	SANDSTONE, clear, white, light greenish-grey, silty to very fine, moderate sorted, sub-angular, calcareous cement (10%), lithic/volcanic grains (20%), feldspar (10%), very poor porosity.
	80	SILTSTONE, white, light greenish-grey, light brownish-grey, lithic/volcanic, feldspathic, minor carbonaceous specks, calcareous in part, sub-fissile to blocky, firm.
2850	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a
2855	40	SANDSTONE, a.a
	60	SILTSTONE, a.a.
2860	40	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
2865	40	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	Tr	COAL, a.a.
2870	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2875	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
2880	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2885	20	SANDSTONE, white, yellowish-grey, silty to very fine, moderate sorted, angular to sub-angular, strong calcite cement (15%), lithic/volcanic grains (15%), feldspar (15%), trace mica, poor porosity.
	80	SILTSTONE, white, yellowish-grey, light greenish-grey, light grey, light brownish-grey, lithic, feldspathic, micro-micaceous, carbonaceous specks, calcareous in part, firm, grades to very fine sandstone.
2890	40	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
2895	40	SANDSTONE, a.a. - mostly white to light grey, also pale orange to light brown, hard, very fine, moderate sorted, sub-angular, very calcareous, lithic, feldspathic, very poor porosity.
	60	SILTSTONE, a.a.
2900	40	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
2905	30	SANDSTONE, clear, white, light greenish-grey, very fine, moderate sorted, sub-angular, moderate calcareous cement (5-10%), lithic/volcanic grains (20%), feldspar (15%), grades to siltstone, poor porosity.
	70	SILTSTONE, a.a.
2910	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2915	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.

2920	30	SANDSTONE, white, yellowish-grey, very fine, poor to moderate sorted, angular to sub-angular, calcareous cement (10%), lithic/volcanic grains (20%), feldspar (15%), silty in part, poor porosity.
	70	SILTSTONE, white, light grey, light brownish-grey, light greenish-grey, lithic, feldspathic, micro-micaceous, trace carbonaceous material, hard, sub-fissile to blocky, sandy in part.
2925	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a. - becoming grey-brown, carbonaceous.
	10	COAL, dark brown to black, shaley.
2930	30	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	SHALE, predominantly brownish-grey, some brownish-black and light greenish-grey, silty, carbonaceous in part and grading to coal in part.
	10	COAL, a.a.
2935	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	Tr	COAL, a.a.
2940	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
2945	40	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
2950	30	SANDSTONE, a.a. - grades to siltstone.
	70	SILTSTONE, a.a. - mostly white to light greenish-grey.
2955	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
2960	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2965	20	SANDSTONE, white, yellowish-grey, light grey-green, silty to very fine, poorly sorted, sub-angular, calcareous cement in part (10%), lithic/volcanic grains (25%), feldspar (15%), trace mica, hard, very poor porosity.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
2970	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	COAL, a.a.
2975	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	20	SHALE, light to medium brownish-grey, light olive-grey, brownish-grey to black, carbonaceous, firm.
	Tr	COAL, a.a.

2980	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a.
	Tr	COAL, a.a.
2985	20	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	COAL, a.a.
2990	20	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	COAL, a.a.
2995	10	SANDSTONE, white, light greenish-grey, moderate sorted, sub-angular, calcareous cement in part (5-10%), lithic/volcanic grains (20%), feldspar (15%), hard, very poor porosity.
	60	SILTSTONE, light brown, light brownish-grey, micro-micaceous, lithic, feldspathic, firm, sub-fissile.
	10	SHALE, moderate brown, brownish-grey, silty, carbonaceous in part.
	10	COAL, a.a.
3000	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
3005	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
3010	10	SANDSTONE, a.a.
	60	SILTSTONE, light to moderate brown, light brownish-grey, sandy in part, lithic, feldspathic, carbonaceous, calcareous in part, firm.
	20	SHALE, light to medium brownish-grey, very carbonaceous in part, firm.
	10	COAL, a.a.
3015	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	Tr	SHALE, a.a.
	Tr	COAL, a.a.
3020	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	20	SHALE, a.a.
	Tr	COAL, a.a.
3025	30	SANDSTONE, clear, white, pinkish-grey, silty to very fine, moderate sorted, sub-angular, moderate to strong calcareous cement (10%), lithic/volcanic grains (20%), feldspar (15%), poor porosity.
	70	SILTSTONE, a.a.
	Tr	SHALE, a.a.
	Tr	COAL, a.a.
3030	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
	Tr	COAL, a.a.

3035	30	SANDSTONE, clear, white, yellowish-grey, very fine, moderate sorted, subangular, calcareous cement (5-10%), lithic/volcanic grains (20%), feldspar (15%), grades to siltstone in part, very poor porosity
	60	SILTSTONE, light to medium brownish-grey, pinkish-grey, lithic, feldspathic, micromicaceous, carbonaceous in part, slightly calcareous, grades to very fine sandstone
	10	COAL, dull to shiney black, brittle
3040	30	SANDSTONE, a.a. - also minor (20%) pale to light blue-green, very fine, lithic (15%), feldspathic (10%), very poor porosity
	70	SILTSTONE, a.a. - minor (10%) pale blue-green to greenish-grey, lithic, micromicaceous.
	Tr	SHALE, a.a.
	Tr	COAL, a.a. - trace pyrite (marcasite?)
3045	20	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	COAL, a.a.
3050	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	20	COAL, a.a.
3055	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	COAL, a.a.
3060	20	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	COAL, a.a.
3065	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	20	COAL, a.a.
3070	20	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	20	SHALE, a.a.
	20	COAL, a.a.
3075	20	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	SHALE, a.a.
	20	COAL, a.a.
3080	20	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	SHALE, a.a.
	20	COAL, a.a.
3085	20	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	SHALE, a.a.
	20	COAL, a.a.

3090	10	SANDSTONE, a.a.
	70	SILTSTONE, light to medium grey, light to medium brownish-grey, occasional light greenish-grey, lithic, feldspathic, micro-micaceous, carbonaceous, calcareous in part, firm.
	10	SHALE, a.a
	10	COAL, a.a.
3095	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
3100	10	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
3105	20	SANDSTONE, white, yellowish-grey, very fine, poor to moderate sorted, angular to sub-angular, moderate calcareous cement (10%), lithic/volcanic grains (20%), feldspar (10%), very poor porosity.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
3110	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	Tr	COAL, a.a.
3115	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	COAL, a.a.
3120	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	COAL, a.a.
3125	20	SANDSTONE, white to very light grey, pinkish-grey. silty to very fine, moderate sorted, angular to sub-angular, medium calcareous cement (10%), lithic (20%), feldspar (15%), trace mica, grades to siltstone, very poor porosity.
	60	SILTSTONE, a.a. - slight to moderate calcareous.
	10	SHALE, a.a.
	10	COAL, a.a.
3130	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
3135	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
3140	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.

3145	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
3150	20	SANDSTONE, a.a.
	70	SILTSTONE, a.a
	10	SHALE, a.a.
3155	30	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	SHALE, a.a.
3160	20	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
	10	COAL, a.a.
3165	40	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	COAL, a.a.
3170	40	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	COAL, a.a.
3175	40	SANDSTONE, clear, white, silty to very fine, poor to moderate sorted, sub-angular, moderate calcareous cement (5-10%), lithic/volcanic grains (15%), feldspar (15%), micaceous in part, poor porosity.
	40	SILTSTONE, a.a.
	20	SHALE, light to medium grey-brown, silty.
3180	40	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
3185	30	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.
3190	70	SANDSTONE, predominantly clear and white, minor light greenish-grey, loose, very fine to medium, mostly fine, moderate sorted, angular to sub-angular, trace calcareous cement, pale greenish-grey lithic grains (10%), white feldspar (5-10%), minor brown mica (<5%), trace pink to red garnet, poor to fair porosity.
	20	SILTSTONE, a.a.
	10	COAL, a.a.
3195	100	SANDSTONE, a.a. - occasional coarse, mostly fine.
	Tr	SILTSTONE, a.a.
	Tr	COAL, a.a.
3200	30	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
	10	SHALE, a.a.
	10	COAL, a.a.

3205	80	SANDSTONE, clear, white, minor pale greenish-grey, loose, very fine to occasional medium, moderate sorted, sub-angular to sub-rounded, calcareous cement (10%), minor clay matrix (<5%), greenish-grey lithic grains (20%), feldspar (15%), trace mica, grades to siltstone, poor porosity.
	20	SILTSTONE, a.a.
3210	80	SANDSTONE, clear, white, minor pale greenish-grey, mostly loose, very fine to occasional medium, poor to moderate sorted, angular to sub-angular, calcareous cement (10%), white clay matrix (5%), grey-green lithic grains (20%), white feldspar (10%), trace mica (<1%), rare garnet, poor porosity.
	20	SILTSTONE, a.a.
3215	20	SANDSTONE, a.a. - rare orange-pink garnet.
	80	SILTSTONE, a.a.
3220	30	SANDSTONE, a.a. - becoming silty and finer and more lithic/feldspathic, very poor porosity.
	70	SILTSTONE, white, light to medium brownish-grey, light grey, lithic, feldspathic, micro-micaceous, carbonaceous, firm, grading to shale in part.
	Tr	COAL, a.a.
3225	20	SANDSTONE, white, very fine, moderate sorted, angular to sub-angular, calcareous cement (10%), white clay matrix (5%), lithic (20%), feldspathic (15%), trace mica, poor porosity.
	80	SILTSTONE, medium to dark grey, brownish-grey, lithic, feldspathic, carbonaceous, micro-micaceous, sub-fissile, firm to hard.
3230	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
3235	10	SANDSTONE, clear, white, loose and aggregates, very fine to occasional medium, moderate sorted, angular to sub-angular, moderate calcareous cement (5%), lithic (20%), feldspar (10%), rare garnet, poor porosity.
	90	SILTSTONE, white to light grey, light to medium brownish-grey, micro-micaceous, carbonaceous in part, firm to hard.
		TRACE DULL YELLOW-WHITE PIN-POINT FLUORESCENCE (<1%), WEAK CUT AND FAINT FILM RESIDUE.
3240	20	SANDSTONE, a.a. - rare garnet.
	80	SILTSTONE, a.a.
		TRACE FLUORESCENCE a.a.
3245	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a. - grades to very fine sandstone.
		TRACE FLUORESCENCE a.a.
3250	20	SANDSTONE, a.a. - rare pink garnet.
	80	SILTSTONE, pinkish-grey, light to medium brownish-grey, light grey, lithic, feldspathic, micaceous and carbonaceous in part, sub-fissile to blocky, firm to hard.
		TRACE FLUORESCENCE a.a.
3255	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
		TRACE FLUORESCENCE a.a.

3260	40	SANDSTONE, clear, white to light grey, very fine to occasional medium, mostly very fine, poor to moderate sorted, angular to sub-angular, moderate to strong calcareous cement (15%), greenish-grey lithic grains (15%), white feldspar (15%), brown mica (1%), rare garnet, very poor porosity.
	60	SILTSTONE, a.a.
		TRACE FLUORESCENCE a.a.
3265	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
3270	40	SANDSTONE, white to light greenish-grey, very fine to fine, moderate sorted, angular to sub-angular, silica cement, lithic (20%), feldspar (15%), trace brown mica , poor porosity.
	60	SILTSTONE, light to medium grey, light brownish-grey, light olive-grey, lithic, feldspathic, micaceous, trace carbonaceous material, firm to hard, sub-fissile to blocky.
3275	30	SANDSTONE, a.a. - moderate hard, calcareous in part.
	70	SILTSTONE, a.a.
3280	60	SANDSTONE, clear, white, very fine to medium, mostly very fine to fine, poor to moderate sorted, angular to sub-angular, silica cement, calcareous in part, green, grey, black and reddish-brown lithic grains (10%), feldspar (10%) - weathered in part, minor brownish mica (<1%), rare pink garnet, friable, poor porosity.
	40	SILTSTONE, light to medium grey, light to medium brownish-grey, lithic, feldspathic, micaceous, minor carbonaceous specks and laminae, sub-fissile, firm.
3285	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
3290	10	SANDSTONE, a.a.
	90	SILTSTONE, a.a.
3295	40	SANDSTONE, a.a. - also light greenish-grey.
	60	SILTSTONE, a.a.
3300	30	SANDSTONE, white to light greenish-grey, very fine to medium, mostly very fine to fine, poor to moderate sorted, angular to sub-angular, weak silica cement, calcareous in part, minor clay matrix (5%), pale green lithic grains (10%), pink and white feldspar (15%), trace mica, rare pink garnet, friable, poor porosity.
	70	SILTSTONE, a.a.
3305	40	SANDSTONE, a.a.
	60	SILTSTONE, a.a. - also brownish-grey to brownish-black, carbonaceous, shaley.
3310	70	SANDSTONE, white, light greenish-grey, pinkish-grey, very fine to medium, mostly fine, poorly sorted, angular to sub-angular, weak silica cement, trace calcite, white clay matrix (5%), pale green and grey lithic grains (10%), feldspar (15%), trace brown mica, firm, very poor porosity.
	30	SILTSTONE, a.a. - micaceous and carbonaceous in part.
3315	70	SANDSTONE, clear, white, light greenish-grey, very fine to occasional medium, poor to moderate sorted, sub-angular to sub-rounded, weak silica cement (<5%), calcareous in part (<5%), minor clay matrix (5%), lithic grains (10%), feldspar (10%), trace mica (<1%), firm, poor porosity.
	30	SILTSTONE, a.a.

3320	60	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
3325	80	SANDSTONE, a.a.
	20	SILTSTONE, a.a.
3330	60	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
3335	50	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
3340	40	SANDSTONE, clear, white, very fine to occasional coarse, mostly fine, poorly sorted, angular, silica cement, clay matrix (5%), pale green lithic grains (10%), white feldspar - weathered (15%), trace mica (1%), rare pink garnet and green chlorite? firm to hard, very poor porosity.
	60	SILTSTONE, a.a.
3345	40	SANDSTONE, a.a. - clay matrix (10%).
	60	SILTSTONE, a.a.
3350	70	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
3355	80	SANDSTONE, a.a.
	20	SILTSTONE, a.a.
3360	20	SANDSTONE, a.a.
	80	SILTSTONE, light grey, light brownish-grey, feldspathic, micro-micaceous, carbonaceous in part, sub-fissile, firm to hard.
3365	70	SANDSTONE, a.a. - rare well developed crystal faces on some quartz grains.
	30	SILTSTONE, a.a.
3370	70	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
3375	70	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
3380	80	SANDSTONE, white pale greenish-grey, very light grey, very fine to coarse, mostly very fine to fine, poor to moderate sorted, angular to sub-angular, weak silica cement, calcareous in part, clay matrix (5%), green, grey and black lithic grains (10%), pinkish and white feldspar (15-20%), minor brown mica (5%), rare pink garnet, firm, poor porosity.
	20	SILTSTONE, a.a.
3385	70	SANDSTONE, a.a.
	20	SILTSTONE, a.a.
	10	SHALE, brownish-grey, greenish-grey, silty.
3390	90	SANDSTONE, a.a.
	10	SILTSTONE, a.a.
3395	90	SANDSTONE, a.a.
	10	SILTSTONE, a.a.

3400	80	SANDSTONE, a.a. - moderately calcareous.
	20	SILTSTONE, a.a.
3405	80	SANDSTONE, white, pinkish-grey to yellowish-grey, light greenish-grey, very fine to medium, poor to moderate sorted, angular to sub-angular, calcareous cement (10%), white clay matrix (5%), green and grey-black lithic grains (10%), white feldspar (15%), trace mica, firm to hard, poor porosity.
	20	SILTSTONE, a.a.
3410	30	SANDSTONE, a.a. - rare garnet.
	70	SILTSTONE, light greenish-grey, light grey, light to medium brownish-grey, lithic, feldspathic, micaceous, carbonaceous in part, sub-fissile, firm to hard.
3415	50	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
3420	40	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
3425	40	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
3430	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
3435	30	SANDSTONE, white, yellowish-grey, light greenish-grey, very fine to medium, poorly sorted, angular to sub-angular, moderate calcareous cement (5%), white clay matrix (5-10%), greenish-grey to black lithic grains (10%), white feldspar - weathered in part (15%), trace brown mica (1%), rare pinkish and red garnet, poor porosity.
	70	SILTSTONE, light brownish-grey, light grey, lithic, feldspathic, micaceous, carbonaceous in part.
3440	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
3445	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
3450	50	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
3455	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
3460	50	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
3465	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
3470	20	SANDSTONE, a.a.
	80	SILTSTONE, pinkish-grey to light brownish-grey, minor light greenish-grey and light olive-grey, lithic, micaceous, feldspathic, carbonaceous specks and laminae, firm, sub-fissile.
3475	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.

3480	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a. - grades to shale in part.
3485	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
3490	20	SANDSTONE, a.a. - moderate to strong calcareous cement (10%).
	80	SILTSTONE, a.a.
3495	20	SANDSTONE, a.a.
	80	SILTSTONE, a.a.
3500	20	SANDSTONE, a.a. - moderate to strong calcareous cement (10%).
	80	SILTSTONE, a.a.
3505	20	SANDSTONE, white, light greenish-grey, very fine to fine, occasional medium, poor to moderate sorted, angular to sub-rounded, silica and calcareous cement, clay matrix (5%), lithic grains (15%), feldspar (10%), occasional brown mica flakes, rare pink garnet, firm, poor porosity.
	80	SILTSTONE, a.a.
3510	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
3515	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
3520	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.
3525	50	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
3529	100	SANDSTONE, clear, white, occasional light greenish-grey, very fine to coarse, poorly sorted, angular to sub-rounded, calcareous cement (5%), grey-green and black lithic grains (10%), white feldspar (5-10%), trace mica (1%), rare garnet, friable to firm, very poor to poor porosity - mostly destroyed by clay and cement.
3530	80	SANDSTONE, a.a. - becoming more lithic and feldspathic.
	20	SILTSTONE, a.a.
3535	80	SANDSTONE, clear, white, occasional pale green, very fine to medium, occasional coarse, poorly sorted, angular to sub-rounded, silica and calcareous cement (10%), clay matrix (5%), green and grey-black lithic grains (10%), white feldspar (5-10%), trace mica, rare garnet, trace to poor porosity.
	20	SILTSTONE, a.a.
3540	90	SANDSTONE, a.a. - becoming fine to coarse, very poor porosity.
	10	SILTSTONE, a.a.
3545	80	SANDSTONE, a.a. - rare garnet, very poor porosity.
	20	SILTSTONE, a.a.
3550	70	SANDSTONE, a.a.
	30	SILTSTONE, a.a.

3555	80	SANDSTONE, white, yellowish-grey, light greenish-grey, very fine to medium, occasional coarse, calcareous cement (10-15%), clay matrix (5%), lithic (15%), feldspar (15%), trace mica, rare garnet, firm, very poor porosity.
	20	SILTSTONE, a.a.
3560	70	SANDSTONE, a.a.
	30	SILTSTONE, a.a.
3565	60	SANDSTONE, a.a.
	40	SILTSTONE, a.a.
3570	40	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
3575	50	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
3580	40	SANDSTONE, a.a.
	60	SILTSTONE, a.a.
3585	50	SANDSTONE, a.a.
	50	SILTSTONE, a.a.
3590	30	SANDSTONE, white, minor pale greenish-grey, very fine to occasional medium, poor to moderate sorted, angular to sub-angular, silica and calcite cement , clay matrix (5%), lithic grains (10%), feldspar (10%), trace biotite, rare rose pink garnet, very poor porosity.
	70	SILTSTONE, grey, light to medium brownish-grey, lithic, feldspathic, micro-micaceous, carbonaceous in part, firm, sub-fissile, grading in part to shale.
3595	30	SANDSTONE, a.a.
	70	SILTSTONE, a.a.

APPENDIX D

APPENDIX D

CONVENTIONAL CORE DESCRIPTIONS

MINORA RESOURCES N.L.

MINORA RESOURCES NL

CORE DESCRIPTION FORM

Basin: OTWAY
Well: WINDERMERE #2
Location: 38°14'11" S 142°01'18" E

Core No.: ONE
Date: 18/3/1989
Depth: 1743.8 - 1749.3 m

m Cut: 5.5
m Recovery: 4.3
m %: 78%

Bit Type/Size: RC476 (8½")
Formation: HEATHFIELD
Described by: D. SHORT

METRES	CORING RATE (mins/metre: 40 80 120 160)	DOMINANT GRAIN SIZE (R, VC, C, M, F, VF, SLT, CLY)	SAMPLES	SKETCH LITHOLOGY SEDIMENTARY STRUCTURES	FACIES	CONTACTS	ROCK TYPE	COLOUR	GRAIN SIZE	SORTING	CEMENTS	AMOUNT Ø	TYPE	SHOWS	COMMENTS
0															
1744 1							LITHIC SANDSTONE	DARK GREENISH GREY	FINE / MEDIUM	MODERATE	ABUNDANT CLAY MATRIX	VERY POOR POROSITY	INTERGRANULAR	NIL	1743.80 - 1746.50 m LITHIC SANDSTONE, dark greenish grey, fine to medium, moderate sorted, sub-angular to sub rounded, crystal faces on some quartz grains, greenish-grey to black lithic grains (30%) feldspar, weathered in part (15%), trace mica, sericite and chlorite (<5%) clay matrix (10%), minor calcareous cemented streaks, very poor porosity.
1745 2															
1746 3								DARK GREY							1746.50 - 1747.45 m CLAYSTONE, dark grey, hard, massive, trace very fine dispersed pyrite? grains, trace carbonaceous material, increasing with depth.
1747 4							CLAYSTONE								1747.45 - 1747.60 m CARBONACEOUS CLAYSTONE, brownish black, hard, sub fissile common carbonaceous material and plant fragments, minor thin very carbonaceous bands.

MINORA RESOURCES N.L.

MINORA RESOURCES NL

CORE DESCRIPTION FORM

Basin OTWAY Well WINDERMERE #2 Location 38°14'11"S 142°01'18"E

Core No. ONE Date 18/3/1989 Depth 1743-8 - 1749.3 m

m Cut 5.5 m Recovery 4.3 m % 78%

Bit Type/Size RC476 (8½") Formation HEATHFIELD Described by D. SHORT

METRES	CORING RATE (mins/metre 40 80 120 160)	DOMINANT GRAIN SIZE (R VC C M F VF SLT CLY)	SAMPLES	SKETCH LITHOLOGY : SEDIMENTARY STRUCTURES	FACIES	CONTACTS	ROCK TYPE	COLOUR	GRAIN SIZE	SORTING	CEMENTS	AMOUNT Ø	TYPE	SHOWS	COMMENTS
1748 0															1747.60 - 1748.10 m CLAYSTONE, as for 1746.50 - 1747.45. 1748.10 - 1749.3m NO RECOVERY.
1749 1															
2															
3															
4															

MINORA RESOURCES N.L.

CORE DESCRIPTION FORM

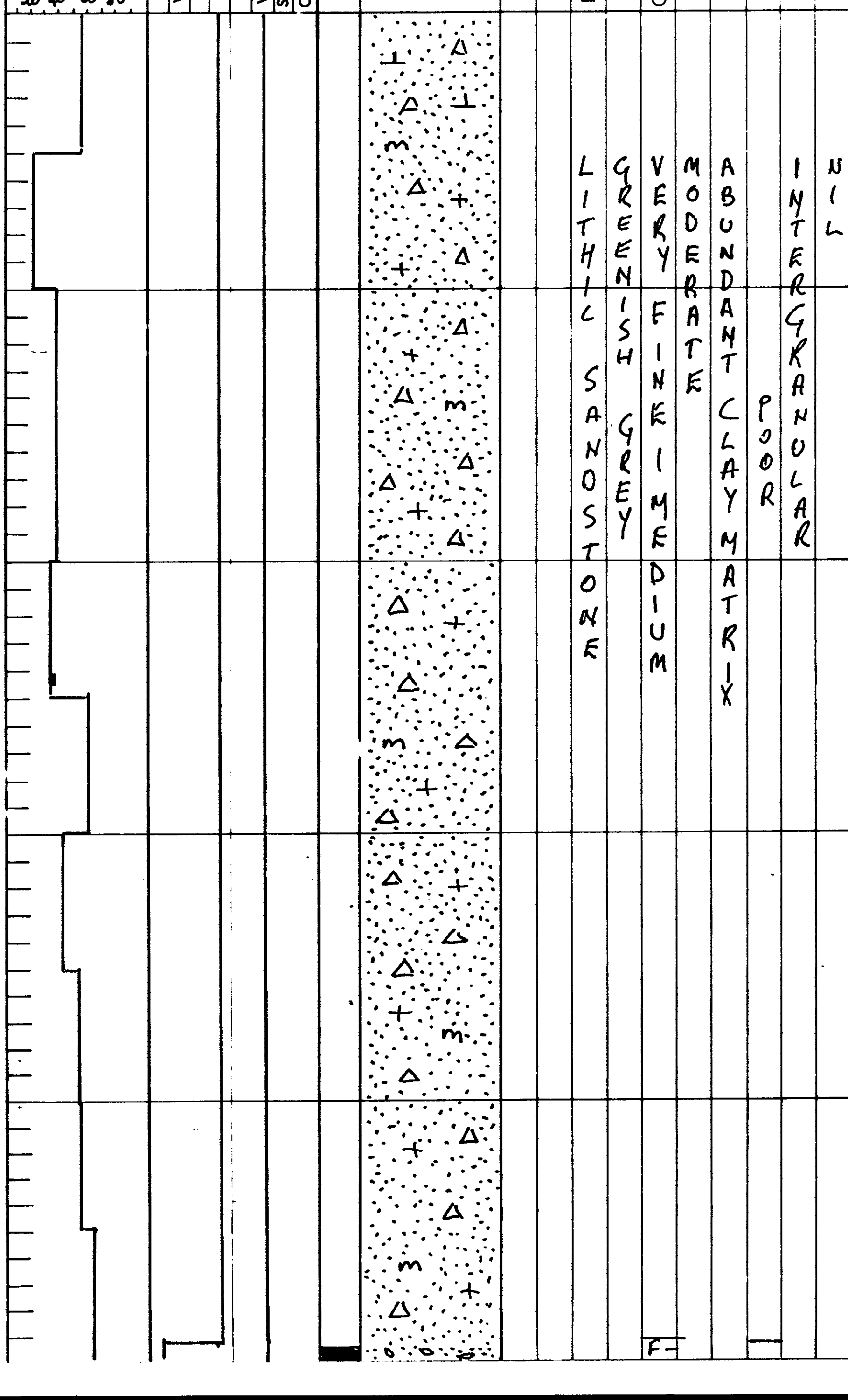
Basin: OTWAY | Well: WINDERMERE #2 | Location: 38°14'11" S 142°01'18" E

Core No.: TWO | Date: 19/3/1989 | Depth: 1777.0 - 1793.9 m

m Cut: 16.9 | m Recovery: 16.8 | m %: 99%

Bit Type/Size: RC476 (8½") | Formation: HEATHFIELD | Described by: D. SHORT

METRES	CORING RATE (MINS/M. 20 40 60 80)	DOMINANT GRAIN SIZE (R VC C M F VF SLT CLY)	SAMPLES	SKETCH LITHOLOGY SEDIMENTARY STRUCTURES	FACIES	CONTACTS	ROCK TYPE	COLOUR	GRAIN SIZE	SORTING	CEMENTS	AMOUNT Ø	TYPE	SHOWS	COMMENTS
1777 0 – 1781 4							LITHIC SANDSTONE	GREENISH GREY	VERY FINE - MEDIUM	MODERATE	ABUNDANT CLAY MATRIX	POOR	INTERGRANULAR	NIL	1777.0 - 1781.9 m SANDSTONE, greenish grey, very fine to medium, moderate sorted, sub rounded, abundant light to dark green and grey green to black lithic grains (30%) feldspar - weathered in part (5-10%) biotite (<5%) clay matrix (10%) hard poor porosity. 1781.9 - 1782.1 m SANDSTONE as for 1777.0 - 1781.9 m but with coarse to very coarse quartz grains and granules, claystone clasts to 0.5 cm, poor to fair porosity. Patchy yellow - white mineral (calcite) fluoresce. 1782.1 - 1782.2 m Tight SANDSTONE with shale/claystone clasts to 2 cm.



MINORA RESOURCES N.L.

MINORA RESOURCES NL

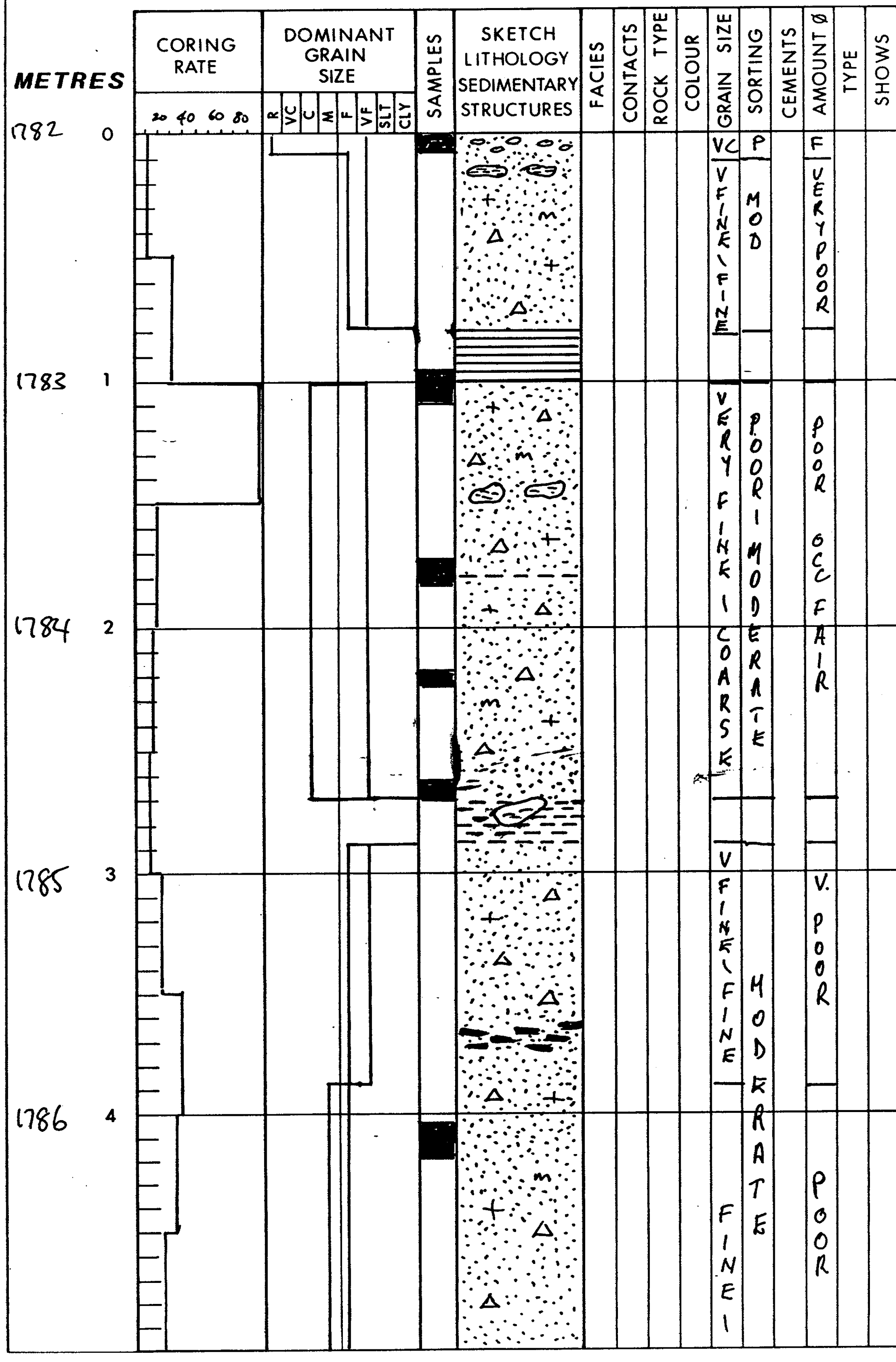
CORE DESCRIPTION FORM

Basin: OTWAY
Well: WINDERMERE #2
Location: 38°14'11" S 142°01'18" E

Core No.: TWO
Date: 19/3/1989
Depth: 1770.0 – 1793.9

m Cut: 16.9
m Recovery: 16.8
m %: 99

Bit Type/Size: RC476 (8½")
Formation: HEATHFIELD
Described by: D. SHORT



COMMENTS

1782.2 – 1782.8 m
SANDSTONE as for 1777.0 – 1781.9 m. Mostly very fine to fine, abundant clay matrix very poor porosity.

1782.8 – 1783.0 m
SHALE, brownish-black, hard, silty, sandy, very carbonaceous, plant fragments, micaceous in part.

1783.0 – 1784.7 m
SANDSTONE as for 1782.2 – 1782.8 m but very fine to coarse, mostly medium, poor to moderate sorted, sub angular, poor porosity.

1784.7 – 1784.9 m
CLAYSTONE, medium to dark grey, hard, trace carbonaceous material, also claystone clasts to 10 cm.

1784.9 – 1785.9 m
SANDSTONE as for 1782.2 – 1782.8 m, carbonaceous laminae from 1785.6 – 1785.7 m.

MINORA RESOURCES N.L.

CORE DESCRIPTION FORM

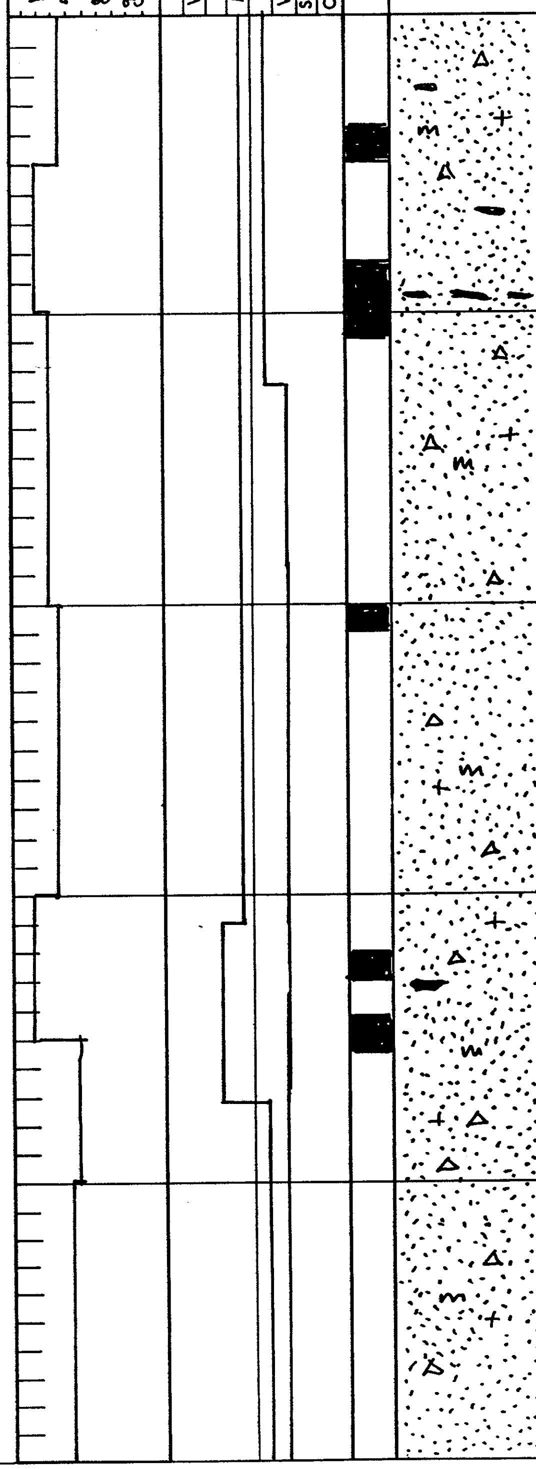
Basin: OTWAY | Well: WINDEMERE #2 | Location: 38°14'11" S 142°01'15"E

Core No.: TWO | Date: 19/3/1989 | Depth: 1770.0 - 1793.9

m Cut: 16.9 | m Recovery: 16.8 | m %: 99%

Bit Type/Size: RC476 (8½") | Formation: HEATHFIELD | Described by: D. SHORT

METRES	CORING RATE (MINS/M. 20 40 60 80)	DOMINANT GRAIN SIZE (R VC C M F VF SLT CLY)	SAMPLES	SKETCH LITHOLOGY SEDIMENTARY STRUCTURES	FACIES	CONTACTS	ROCK TYPE	COLOUR	GRAIN SIZE	SORTING	CEMENTS	AMOUNT Ø	TYPE	SHOWS	COMMENTS
1787 0									MEDIUM	MODERATE		POOR/FAIR			1785.9 - 1788.3 m SANDSTONE, as for 1777.0 - 1781.9 m, fine to medium, minor carbonaceous laminae poor to fair porosity.
1788 1									VERY FINE TO MEDIUM	POOR TO MODERATE		VERY POOR			1788.3 - 1790.1 m. SANDSTONE as for 1777.0 - 1781.9 m, very fine to medium, very poor porosity.
1789 2												POOR			
1790 3									VF - C			POOR/FAIR			1790.1 - 1790.7m SANDSTONE as for 1777.0 - 1781.9m but medium to coarse grained in part with carbonaceous fragments, poor - to fair porosity.
1791 4									VERY FINE	MODERATE		VERY POOR			



MINORA RESOURCES N.L.

MINORA RESOURCES NL

CORE DESCRIPTION FORM

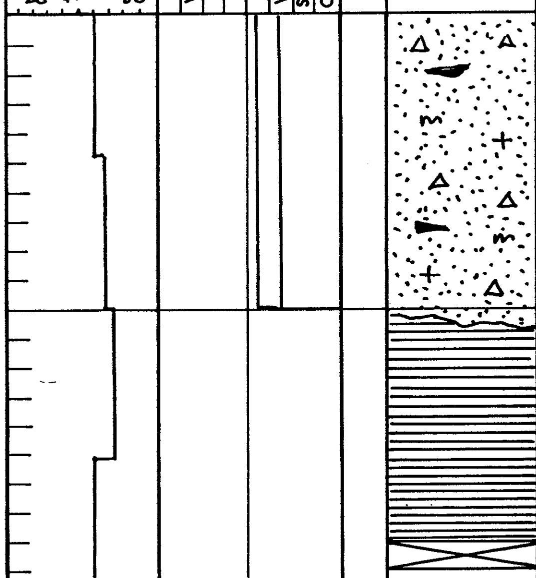
Basin OTWAY **Well** WINDERMERE #2 **Location** 38°14'11" S 142°01'18" E

Core No. TWO **Date** 19/3/1989 **Depth** 1770.0 - 1793.9

m Cut 16.9 m **m Recovery** 16.8 m **m %** 99.4

Bit Type/Size RC476 (8½") **Formation** HEATHFIELD **Described by** D. SHORT

METRES	CORING RATE (MINS/M. 20 40 60 80)	DOMINANT GRAIN SIZE (ẞ VC C M F VF SLT CLY)	SAMPLES	SKETCH LITHOLOGY SEDIMENTARY STRUCTURES	FACIES	CONTACTS	ROCK TYPE	COLOUR	GRAIN SIZE	SORTING	CEMENTS	AMOUNT Ø	TYPE	SHOWS	COMMENTS
1792 0									FINE			POOR			1790.7 - 1793.0 m. SANDSTONE as for 1777.0 - 1781.9 m, very fine to fine, minor carbonaceous specks and laminae, poor porosity.
1793 1															1793.0 - 1793.8 m SHALE dark grey-brown, hard; minor carbonaceous fragments and plant fossils.
1794 2															1793.8 - 1793.9 m NO RECOVERY
3															
4															



APPENDIX E

APPENDIX E

SIDEWALL CORE DESCRIPTIONS

MINORA RESOURCES NL

SIDE WALL CORE DESCRIPTION

WELL: WINDERMERE #2

RUN N°: ONE ATTEMPT: 24 REC: 22 DEPTH FROM: 3200 - 1876 m LOG DATE: 18/4/89 GEOLOGIST: D.A. SHORT SHEET 1 OF 3

SWC N°	DEPTH	REC. (cm)	ROCK TYPE	%	COLOUR	MAJOR GRAIN SIZE	MAJOR GRAIN SHAPE	MAJOR GRAIN TYPE	MAJOR GRAIN SRTG	MINOR GRAIN TYPE	MINOR GRAIN %	MINOR GRAIN TYPE	MINOR GRAIN %	INDURATION	TEXTURE	MATRIX COL.	MATRIX TYPE	CAL	DOL	CEMENT	Ø	K	STAIN	FLUORESCENCE %	FLUORESCENCE COL.	FLUORESCENCE TYPE	CUT COL.	CUT TYPE	CUT RESD	REMARKS
1	3200	2	clyst	100	ol-gy										sft - frm															
2	3194	1	sst/cly	100	Wh Yell-gy Gy - Or	VF-F	A-SA	Qtz	M	Lith	10				sft/loose (broken up)	Wh	Cly			Calc	VP			-						Very Calc (15%) Clay & Clay Mtx is 30-40% (Core is "Mushy")
3	3192	0																												No recovery
4	3191	2	sst	100	Wh	VF-F	A-SA	Qtz	M	Lith	10	Mica	1		frm - friable	Wh	Cly			Calc	Pr	very low		-						Abt cly mtx 10% & weathered felds &
										Feld	10	Gar-net	Tr																	mica destroys reservoir potential
5	3190	2½	sst	100	Wh yell -gy	VF-F	A-SA	Qtz	M	Lith	10	Mica	1		frm - friable	Wh	Cly			Trace Calc	Pr	very low		-						As for SWC #4 but less calc cement
										Feld	10	Gar-net	Tr																	
6	3167	2	clst	100	med. gy										sft - frm															
7	3100	1½	slst	100	Brn - gy					Carb		Mica			frm															Slst, carb, mica, Qtz & sandy i.p.
8	3055	1½	clst	100	Dk gy										sft - frm															Clyst,silty & carb in part.
9	3015	2	slst	100	Brn - gy										frm															Slst, sandy & carb in part.
10	2945	2	lst	100	Lt brn Pale Yell - brn										silty & arg															Lst firm to hard, arg and silty.

MINORA RESOURCES NL

SIDE WALL CORE DESCRIPTION

WELL: WINDERMERE #2

RUN N°: ONE ATTEMPT: 24 REC: 22 DEPTH FROM: 3200 - 1876m LOG DATE: GEOLOGIST: D.A. SHORT SHEET 2 OF 3

SWC N°	DEPTH	REC. (cm)	ROCK TYPE	%	COLOUR	MAJOR GRAIN SIZE	MAJOR GRAIN SHAPE	MAJOR GRAIN TYPE	MAJOR GRAIN SRTG	MINOR GRAIN TYPE	MINOR GRAIN %	MINOR GRAIN TYPE	MINOR GRAIN %	INDUR-ATION	TEXTURE	MATRIX COL.	MATRIX TYPE	CAL	DOL	CEMENT	Ø	K	STAIN	FLUORESCENCE %	FLUORESCENCE COL.	FLUORESCENCE TYPE	CUT COL.	CUT TYPE	CUT RESD	REMARKS
11	2873	1½	sst	100	Wh -lt gy	Silt -vf	SA	Qtz	P -M	Lith	10	Felds	10		frm	Wh	Cly (10%)			Calc (10%)	very pr.	very low		-						Sst, vf, silty, clay "choked" v. pr porosity.
12	2806	3	Shale	100	Dusky Yell-brn										frm sub fiss.															
13	2697	2	slst	100	Med gy			Qtz		Mica		Carb			frm															Slst with minor thin v.f. sst band
14	2615	2	clst	100	Med-dk gy										sft - frm															
15	2534	2	sst/ clst	100	Wh	Clay - VF	SA	Qtz	M	Lith Felds	10 10	Mica	Tr		sft - loose	Wh	Cly			Calc (5)	very pr	very low		-						Sst with 20-30% clyst/cly mtx.
16	2531	1½	sst	100	Wh Lt gy	VF	A- SR	Qtz	M	Lith Felds	15 10				sft - friable	Wh	Cly (10%)			Calc (5)	very pr	very low		-						Sst - clay "choked" v.p por.
17	2526	2	clst	100	Dk gy										sft - frm															
18	2443	2	clst	100	Med - Dk gy										sft - frm															Clyst - silty in part.
19	2352	3	slst	100	brownish blk			Qtz		Mica Carb					frm															Slst, dk brn - blk, carb, sandy in part
20	2240	3	slst	100	brn gy			Qtz		Mica Carb					frm															Slst as for SWC 19 - sandy lenses
21	2143	1	slst	100	ol gy										frm - hard															Slst very calc - grading to silty Lst.

MINORA RESOURCES NL

SIDE WALL CORE DESCRIPTION

WELL: WINDERMERE #2

RUN Nº: ONE ATTEMPT: 24 REC: 22 DEPTH FROM: 3200 - 1876 LOG DATE: 18/4/89 GEOLOGIST: D.M. SHORT SHEET 3 OF 3

SWC Nº	DEPTH	REC. (cm)	ROCK TYPE	%	COLOUR	MAJOR GRAIN				MINOR GRAIN				INDUR-ATION	TEXTURE	MATRIX		CAL	DOL	CEMENT	Ø	K	STAIN	FLUORESCENCE			CUT			REMARKS
						SIZE	SHAPE	TYPE	SRTG	TYPE	%	TYPE	%			COL.	TYPE							%	COL.	TYPE	COL.	TYPE	RESD	
22	2007	3	clst	100	Med gy										sft-frm															Clystn, silty in part.
23	1913	3	clst	100	Med drk gy										sft - frm															
24	1876	3	slst	100	Wh - lt gy			Qtz							frm															Slst, sandy & v. arg.

APPENDIX F

APPENDIX F

CORE ANALYSIS

GEARHART CORE DATA PTY. LTD.

MINORA RESOURCES N.L.

CORE ANALYSIS REPORT For

WINDERMERE No. 2

Unit 17/19 Musgrave Avenue, Welland, S.A. 5007 Telephone (08) 46 4759 Telex AA87137

GEARHART CORE DATA

GEARHART CORE DATA PTY. LTD.
UNIT 2, 17-19 MUSGRAVE AVENUE
WELLAND, S.A.
TELEPHONE: (08) 46 4759. FAX: (08) 46 0995

CORE ANALYSIS RESULTS

Company	MINORA RESOURCES N.L.	Formation	HEATHFIELD	File	CD-SA-310
Well	WINDERMERE No. 2			Date Report	03.04.1989
Field	APPRAISAL			Analysts	DS, PA
State	VICTORIA	Location	OTWAY BASIN		

Lithological Abbreviations

SAND — SD, SHALE — SH, LIME — LM, DOLOMITE — DOL, CHERT — CH, GYPSUM — GYP, ANNHYDRAITE — ANHY, CONGLOMERATE — CONG, FOSSILIFEROUS — FOSS, SANDY — SDY, SHALY — SHY, LIMY — LMY, FINE — FN, MEDIUM — MED, COARSE — CSE, CRYSTALLINE — XLN, GRAIN — GRN, GRANULAR — GRNL, BROWN — BRN, GRAY — GY, VUGGY — VGY, FRACTURED — FRAC, LAMINATION — LAM, STYLOLITIC — STY, SLIGHTLY — SLI, VERY — VI, WITH — WI

SAMPLE No.	DEPTH Metres	PERMEABILITY MILLIDARCYS K.A.	POROSITY % He inj	RESIDUAL SATURATION % PORE OIL	RESIDUAL SATURATION % PORE WATER	GRAIN DENSITY	VERT PERM	SAMPLE DESCRIPTIONS AND REMARKS
1	1743.83	0.087	13.4			2.63		SST: grnish gy, f-med grn, mod hd, mod srt, 10% wht cly, mod hd sil cmt, sbang-mnr sbrnd, abnt lt-dk gy lith grns, occ altered felds, tr biotite & chlorite, pr visual por.
2	1744.43	0.112	13.6			2.65		SST: grnish gy, f-occ med grn, mod hd, mod srt, 10% wht cly mtx, mod hd sil cmt, sbang-mnr sbrnd, 20-30% lt gy-occ blk frm lith grns, pred trans quartz, occ pink & green grns, pr visual porosity.
3	1745.03	0.058	13.7			2.65		SST: greenish gy, f-med grn, mod hd, mod-pr srt, v arg mtx, mod hd sil cmt, sbang-sbrnd, a/a.
4	1745.64	0.097	13.7			2.63		SST: a/a.
5	1746.24	0.213	15.3			2.67		SST: greenish gy, f-med grn, mod hd, mod srt, abnt wht arg mtx, a/a.
6	1777.02	0.059	11.5			2.63		SST: a/a, occ f carb grns.
7	1777.60	0.007	3.2			2.65		SST: greenish gy, med-f grn, mod hd-hd, mod srt, comm arg mtx, hd sil cmt, sbang-sbrnd, a/a, v pr visual porosity.
8	1778.21	0.157	16.2			2.63		SST: greenish gy, med-f grn, mod hd, mod srt, abnt wht arg mtx, mod hd sil cmt, sbang-sbrnd, abnt lt-dk gy lith grns, occ lt green lith grns, pr visual porosity.
9	1778.79	0.141	15.2			2.64		SST: a/a.
10	1779.43	0.064	13.6			2.60		SST: a/a, occ biotite flakes.
11	1780.00	0.071	14.9			2.61		SST: greenish gy, f-occ med gy, mod hd, mod srt, abnt wht arg mtx, mod hd sil cmt, sbang-sbrnd, a/a.
12	1780.66	0.076	13.7			2.60		SST: a/a, comm biotite flakes.

GEARHART CORE DATA

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UNIT 2, 17-19 MUSGRAVE AVENUE
WELLAND, S.A.
TELEPHONE: (08) 46 4759. FAX: (08) 46 0995

CORE ANALYSIS RESULTS

Company MINORA RESOURCES N.L. Formation HEATHFIELD File CD-SA-310
Well WINDERMERE No. 2 Date Report 03.04.1989
Field APPRAISAL Analysts DS, PA
State VICTORIA Location OTWAY BASIN

Lithological Abbreviations

SAND — SD	DOLOMITE — DOL	ANNHYDRAITE — ANHY	SANDY — SDY	FINE — FN	CRYSTALLINE — XLN	BROWN — BRN	FRACTURED — FRAC	SLIGHTLY — SLI
SHALE — SH	CHERT — CH	CONGLOMERATE — CONG	SHALY — SHY	MEDIUM — MED	GRAIN — GRN	GRAY — GY	LAMINATION — LAM	VERY — VI
LIME — LM	GYPSUM — GYP	FOSSILIFEROUS — FOSS	LIMY — LMY	COARSE — CSE	GRANULAR — GRNL	VUGGY — VGY	STYLOLITIC — STY	WITH — WI

SAMPLE No.	DEPTH Metres	PERMEABILITY MILLIDARCYS K.A.	POROSITY % He inj	RESIDUAL SATURATION % PORE OIL	WATER	GRAIN DENSITY	VERT PERM	SAMPLE DESCRIPTIONS AND REMARKS
13	1781.20	0.117	14.9			2.61		SST: greenish gy, f-rr med grn, mod hd, v arg mtx, mod sil cmt, sbang-occ ang, abnt lt-dk gy lithic grns, occ tan & wht altered felds, pr visual porosity.
14	1781.88	0.122	11.9			2.62		SST: greenish gy, f-rr crse grn, hd, pr srt, v arg mtx, mod sil cmt, sbrnd-occ cong-ang.
34	1782.06	3.1	7.9	0.0	72.3	2.63		SST: greenish gy & wht-clr, f-v crse cong lenses, hd, pr srt, argill & calc in cong, mod sil cmt, sbrnd-ang, comm sft greenish gy clyst incl, lithics, comm felds, rr mica.
15	1782.45	0.067	14.6			2.64		SST: greenish gy & wht-clr, f grn, mod hd, mod srt, v arg mtx, mod sil cmt, sbang-sbrnd, a/a, w- occ v crse to pebbly clyst clasts.
35	1783.07	0.374	17.5	0.0	70.8	2.69		SST: greenish gy, f-med grn, occ crse lensed, mod srt, argill mtx, mod silc mtd, sbang-sbrnd, occ clyst incl, abnt gy lith, rr carb mica, comm weathered felds.
16	1783.18	0.260	15.4			2.65		SST: greenish gy, med-f grn, mod hd, mod-pr srt, mod arg mtx, mod sil cmt, sbang-sbrnd, abnt gy lithic grns, occ carb grns, pr visual porosity.
17	1783.70	0.657	14.5	0.0	66.2	2.64		SST: greenish gy, med, occ crse grn, mod hd, pr srt, v arg mtx, mod sil cmt, sbang-sbrnd, a/a w/ cong text w/ comm v crse qtz grns & pebbly clyst clasts.
18	1784.29	0.579	15.3	0.0	62.0	2.65		SST: greenish gy, med-f grn, mod hd, mod srt, v arg mtx, mod sil cmt, sbang-sbrnd, a/a.
36	1784.67	2.0	17.0	0.4	78.2	2.68		SST: greenish gy, dom med, occ crse grn mod hd, mod-well srt, v arg mtx, tr sil cmt, sbang-sbrnd, abnt lt-dk gy liths, occ carb, felds, mica

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CORE ANALYSIS RESULTS

Company MINORA RESOURCES N.L. Formation HEATHFIELD File CD-SA-310
Well WINDERMERE No. 2 Date Report 03.04.1989
Field APPRAISAL Analysts DS, PA
State VICTORIA Location OTWAY BASIN

Lithological Abbreviations

SAND — SD, SHALE — SH, LIME — LM, DOLOMITE — DOL, CHERT — CH, GYPSUM — GYP, ANNHYDRAITE — ANHY, CONGLOMERATE — CONG, FOSSILIFEROUS — FOSS, SANDY — SDY, SHALY — SHY, LIMY — LMY, FINE — FN, MEDIUM — MED, COARSE — CSE, CRYSTALLINE — XLN, GRAIN — GRN, GRANULAR — GRNL, BROWN — BRN, GRAY — GY, VUGGY — VGY, FRACTURED — FRAC, LAMINATION — LAM, STYLOLITIC — STY, SLIGHTLY — SLI, VERY — VI, WITH — WI

SAMPLE No.	DEPTH Metres	PERMEABILITY MILLIDARCYS K.A.	POROSITY % He inj	RESIDUAL SATURATION % PORE OIL	RESIDUAL SATURATION % PORE WATER	GRAIN DENSITY	VERT PERM	SAMPLE DESCRIPTIONS AND REMARKS
19	1785.00	0.081	13.5			2.61		SST: greenish gy, f-occ med grn, mod hd, mod srt, v arg mtx, mod sil cmt, sbang-sbrnd, abnt lt-dk gy lith grns, occ carb grns, occ biotite flakes.
20	1785.60	0.179	12.5			2.60		SST: a/a.
21	1786.24	0.432	16.4	0.0	65.5	2.63		SST: a/a.
22	1786.83	0.088	15.0			2.64		SST: a/a.
23	1787.40	0.288	13.9			2.63		SST: a/a, f-med grn, w/ occ thin carb laminae and grns.
37	1787.47	0.510	15.5	0.0	70.3	2.66		SST: greenish gy, f-dom med grn, mod hd, mod-pr srt, v arg mtx, mod sil cmt, sbang-sbrnd, abnt lt-dk gy lithic grns, occ altered felds, occ carb grns, rr vf sst lenses.
24	1788.06	0.595	14.7	0.0	63.5	2.64		SST: greenish gy, f-med grn, mod hd, mod-pr srt, v arg mtx, mod sil cmt, sbang-mnr sbrnd, abnt lt-dk gy lithic grns, occ altered felds, occ carb grns, pr visual porosity.
25	1788.70	0.108	14.0			2.62		SST: a/a.
38	1789.05	0.278	16.2	0.0	69.2	2.67		SST: a/a.
26	1789.30	0.137	14.8			2.62		SST: greenish gy, f-med grn, mod hd, mod srt, v arg mtx, mod sil cmt, sbang-mnr sbrnd, abnt lt-dk gy arg lith grns, comm carb grns, v pr visual porosity.
27	1789.91	0.122	15.2			2.64		SST: a/a, f grn, sbang-sbrnd.
39	1790.26	4.3	16.9	0.2	68.1	2.66		SST: greenish gy, med-dom crse, occ v crse grn, frm-mod hd, mod srt, v arg mtx, lightly sil cmtd, sbang-sbrnd, a/a.

GEARHART CORE DATA

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TELEPHONE: (08) 46 4759. FAX: (08) 46 0995

CORE ANALYSIS RESULTS

Company MINORA RESOURCES N.L. | Formation HEATHFIELD | File CD-SA-310
Well WINDERMERE No. 2 | Date Report 03.04.1989
Field APPRAISAL | Analysts DS, PA
State VICTORIA | Location OTWAY BASIN

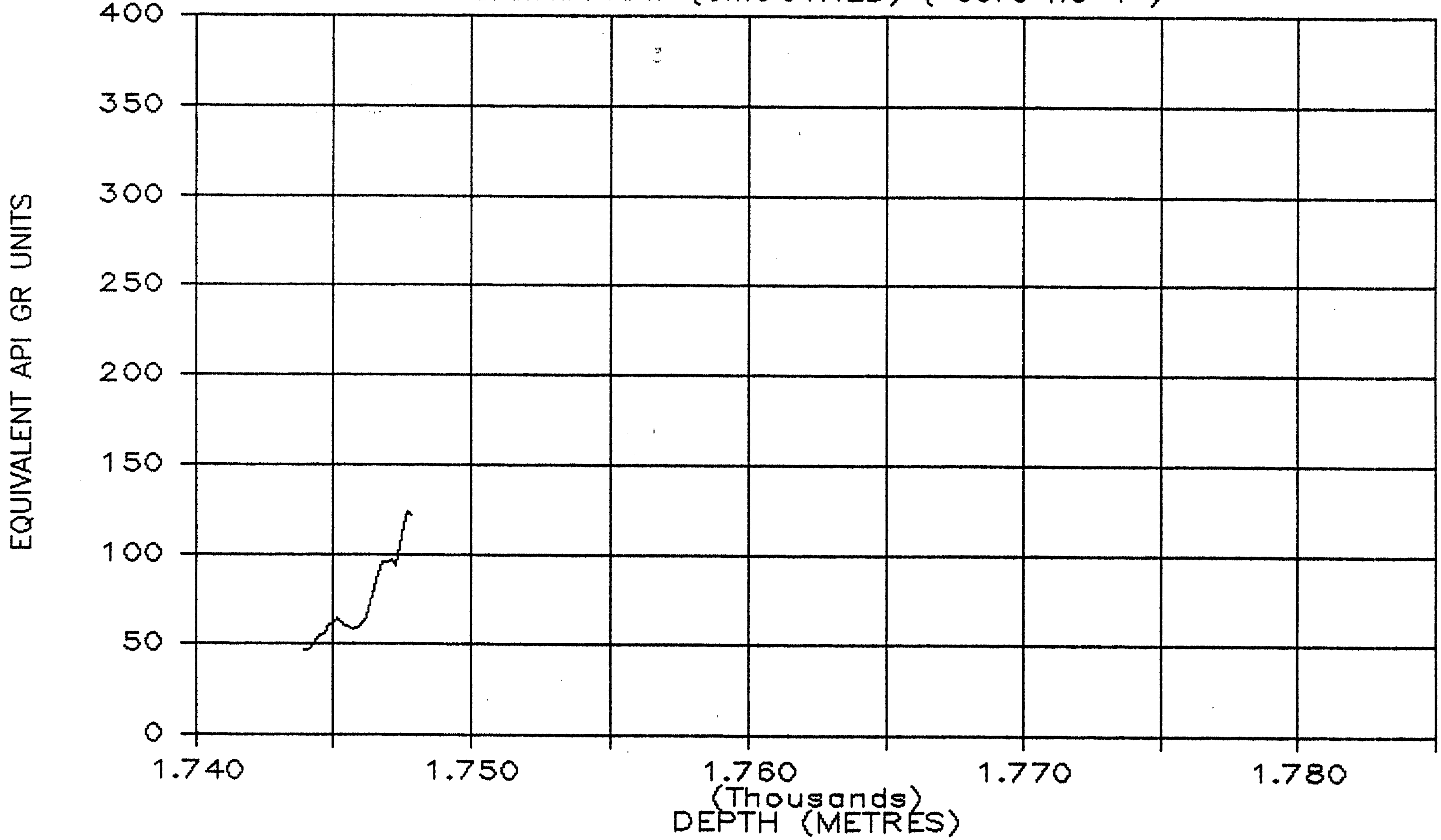
Lithological Abbreviations

AND — SD	DOLOMITE — DOL	ANNHYDRAITE — ANHY	SANDY — SDY	FINE — FN	CRYSTALLINE — XLN	BROWN — BRN	FRACTURED — FRAC	SLIGHTLY — SLI
HALE — SH	CHERT — CH	CONGLOMERATE — CONG	SHALY — SHY	MEDIUM — MED	GRAIN — GRN	GRAY — GY	LAMINATION — LAM	VERY — VI
IME — LM	GYPSUM — GYP	FOSSILIFEROUS — FOSS	LIMY — LMY	COARSE — CSE	GRANULAR — GRNL	VUGGY — VGY	STYLOLITIC — STY	WITH — WI

MPLE No.	DEPTH Metres	PERMEABILITY MILLIDARCYS K.A.	POROSITY % He inj	RESIDUAL SATURATION % PORE OIL	WATER	GRAIN DENSITY	VERT PERM	SAMPLE DESCRIPTIONS AND REMARKS
28	1790.51	2.5	17.1	0.0	58.8	2.66		SST: greenish gy, med-occ v crse grn, mod hd, pr-mod srt, v arg mtx, mod sil cmt, sbang-sbrnd, abnt lt-dk gy arg lith grns, comm carb grns, conglomeratic i/p.
29	1791.11	0.057	14.0			2.61		SST: greenish gy, med-f grn, mod hd, mod srt, v arg mtx, mod sil cmt, sbang-sbrnd, abnt lt-dk gy lith grns, pr visual porosity.
30	1791.72	0.047	15.2			2.62		SST: a/a.
31	1792.34	0.025	13.8			2.61		SST: greenish gy, f-occ med grn, mod hd, mod srt, v arg mtx, mod sil cmt, sbang-sbrnd, a/a, w/ occ vf carb /micac/laminae.
32	1792.94	0.045	13.7			2.62		SST: a/a, f-rr med grn.
33	1793.34	0.004	6.5			2.58		SST: greenish gy, f-v crse grn, mod hd, pr srt, v arg mtx, mod sil cmt, sbang-sbrnd, cong texture w/ pebbly clyst clasts.

WINDERMERE NO 2

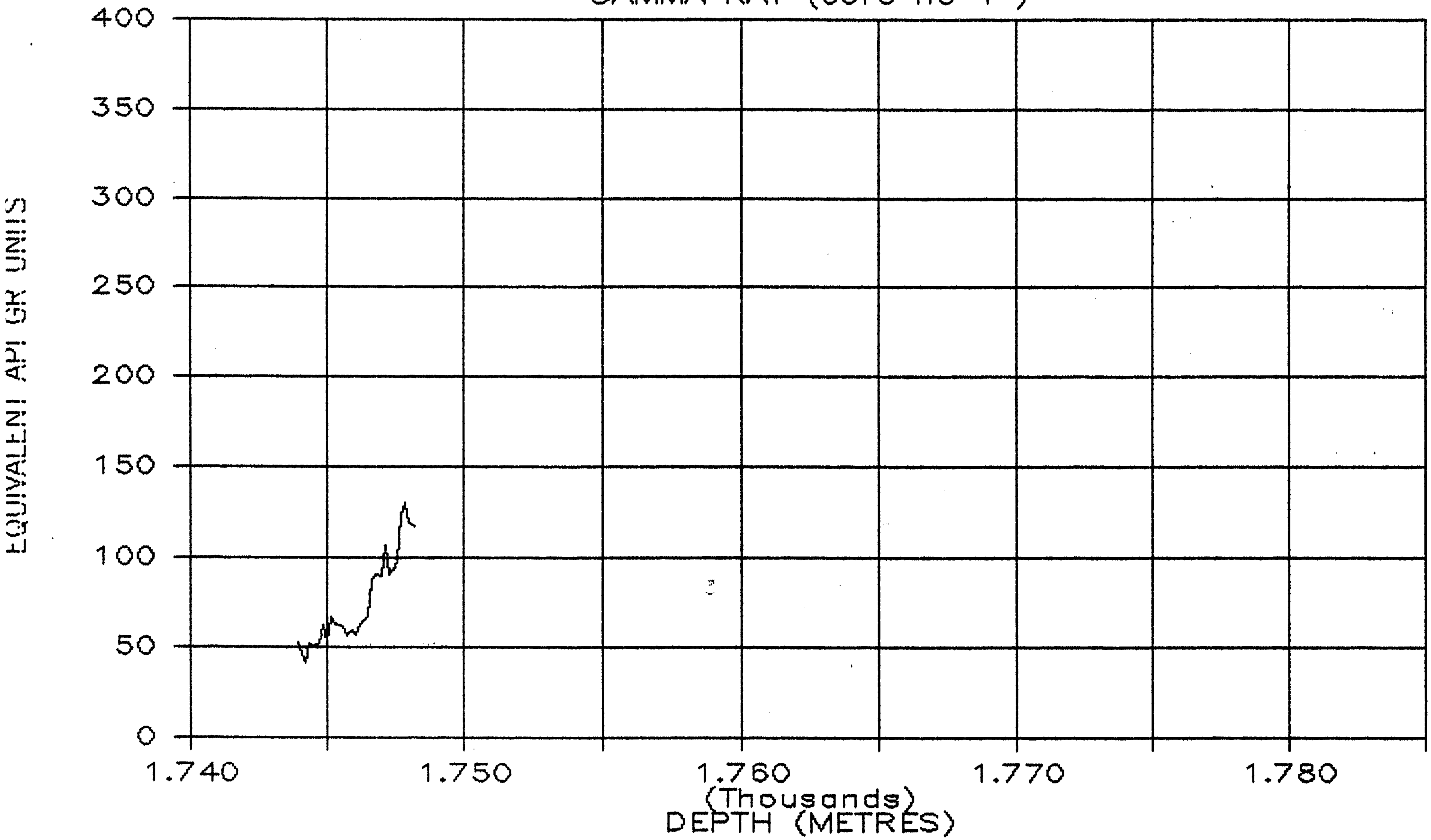
GAMMA RAY (SMOOTHED) (core no 1)



GEARHART AUSTRALIA

WINDERMERE NO 2

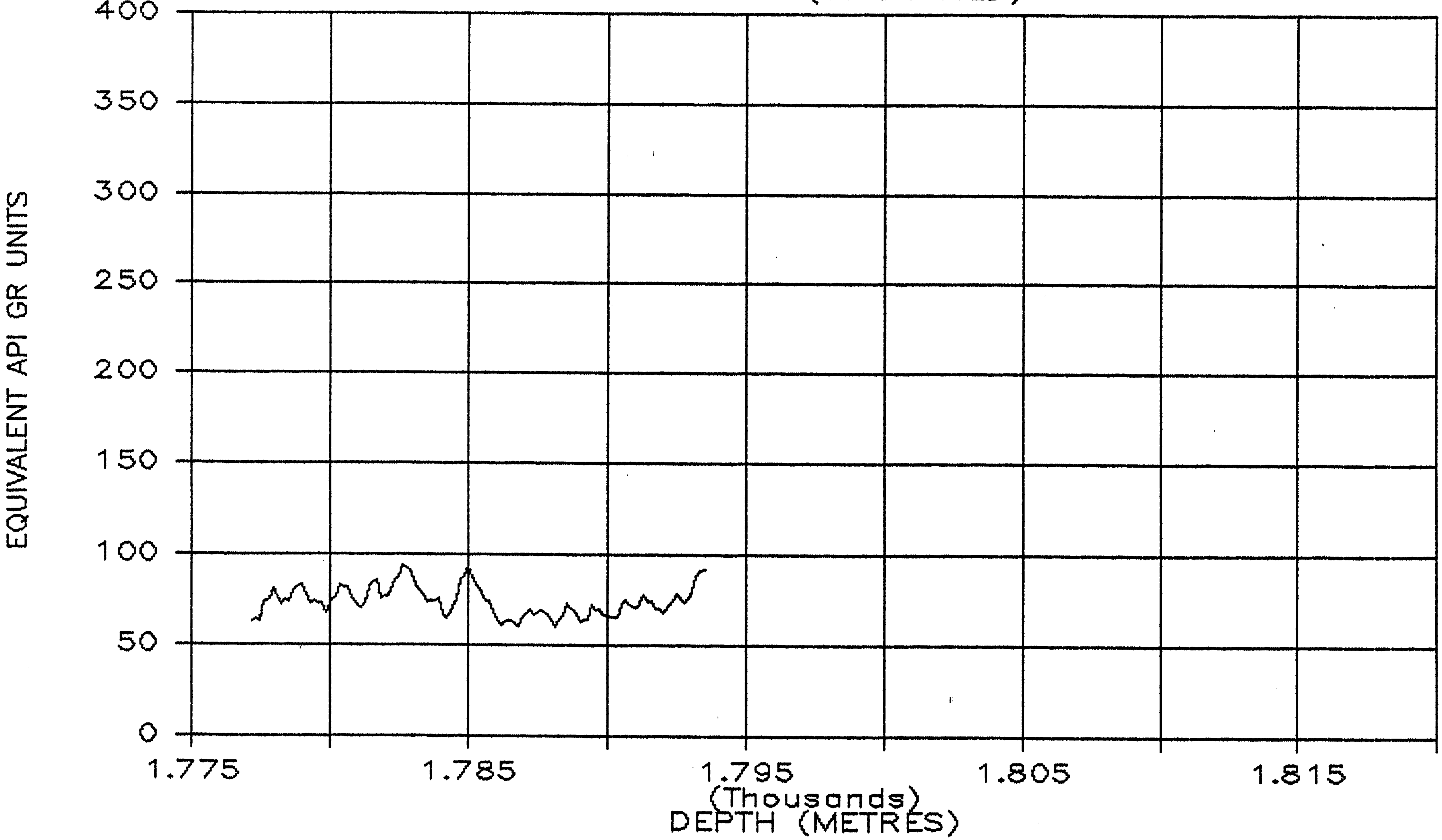
GAMMA RAY (core no 1)



GEARHART AUSTRALIA

WINDERMERE NO 2

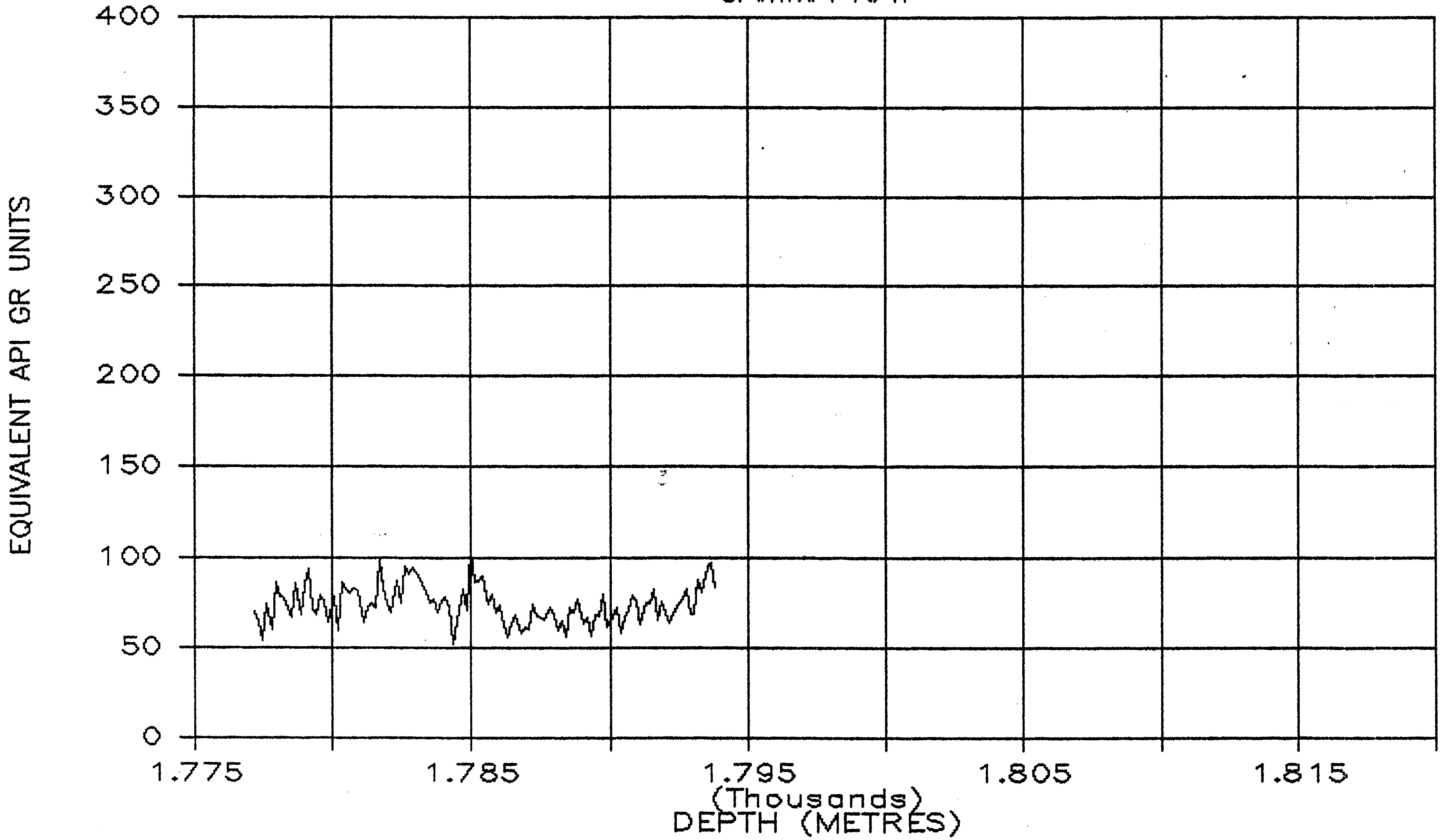
GAMMA RAY (SMOOTHED)



GEARHART AUSTRALIA

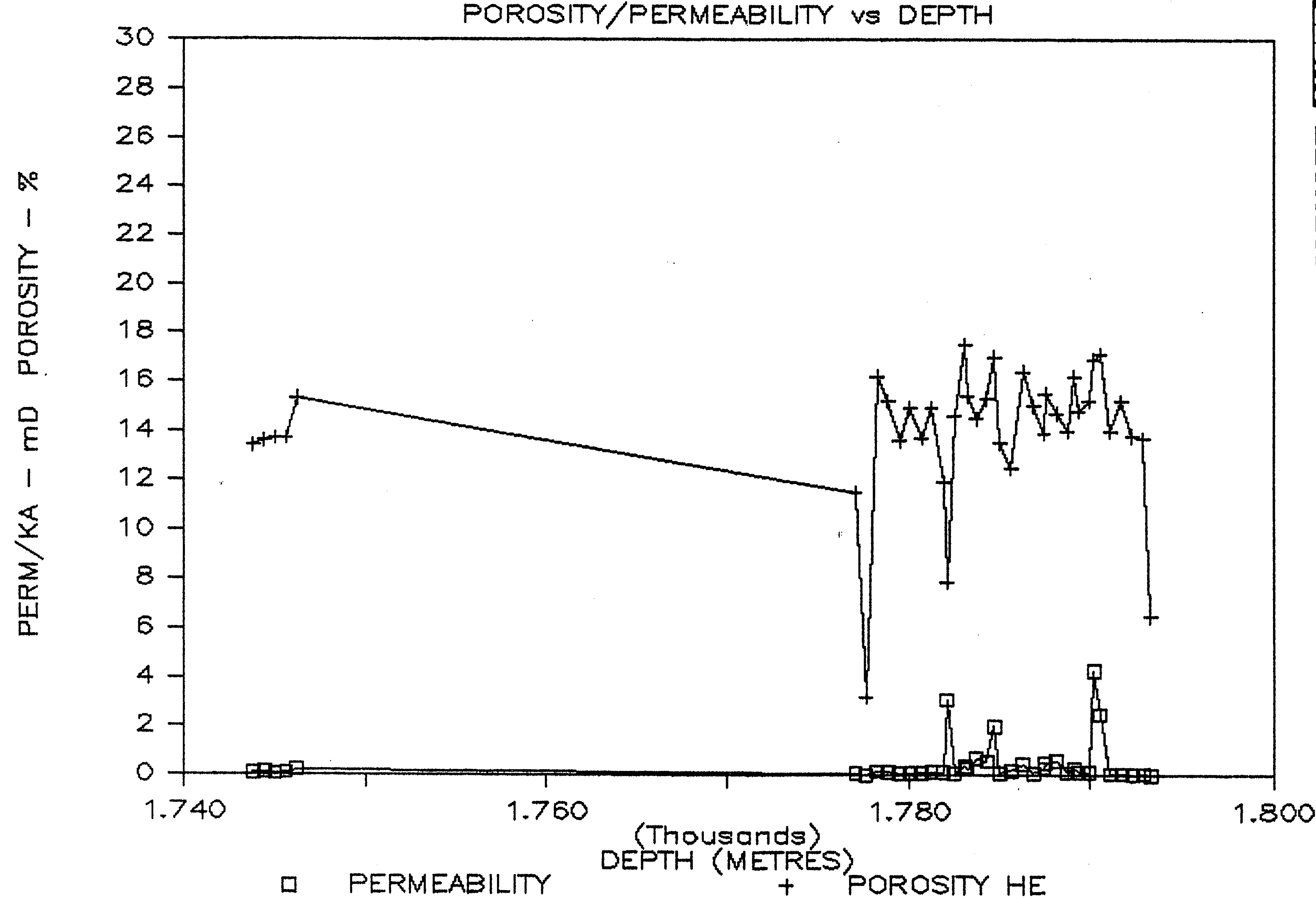
WINDERMERE NO 2

GAMMA RAY

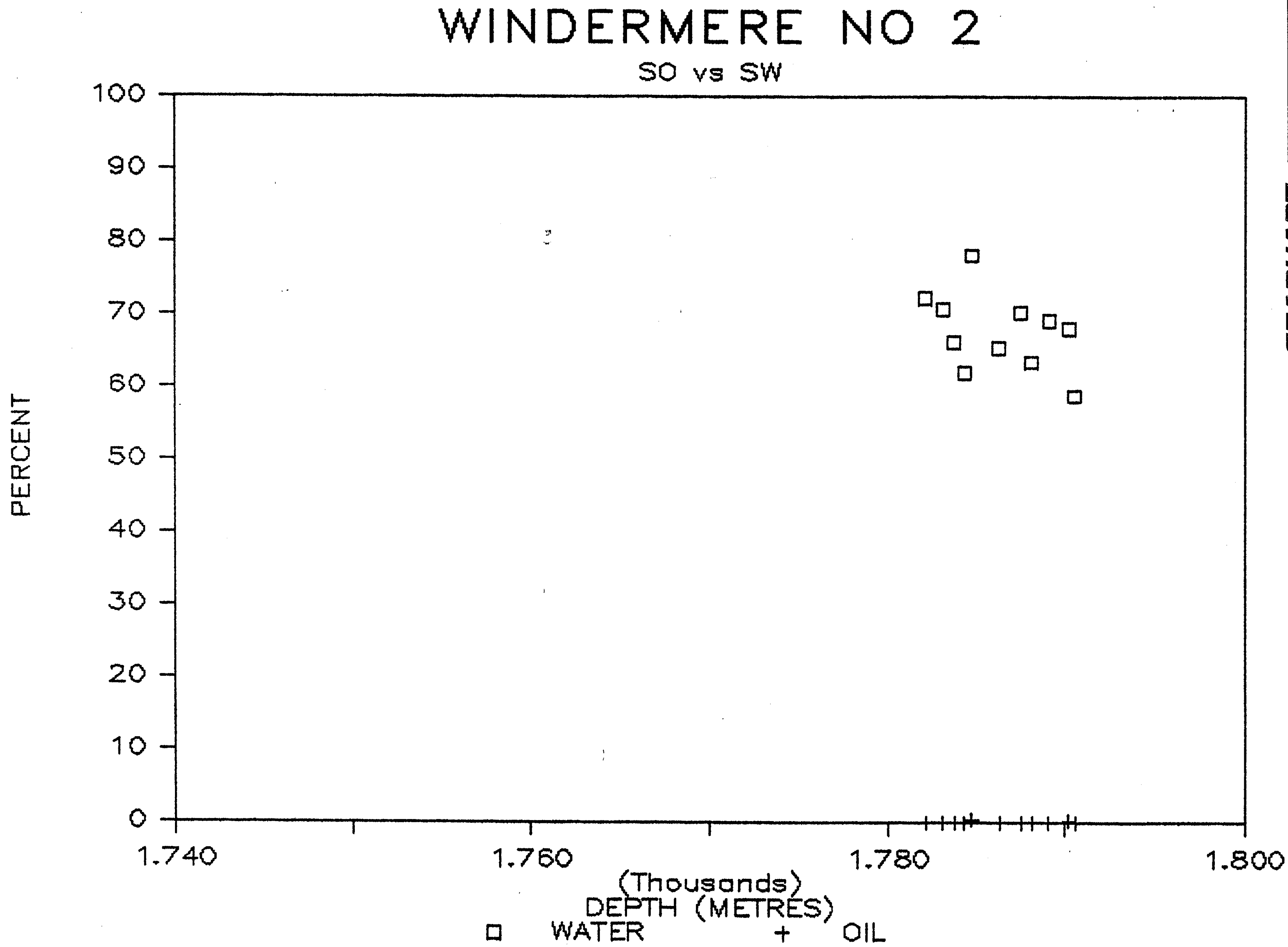


GEARHART AUSTRALIA

WINNDERMERE NO 2



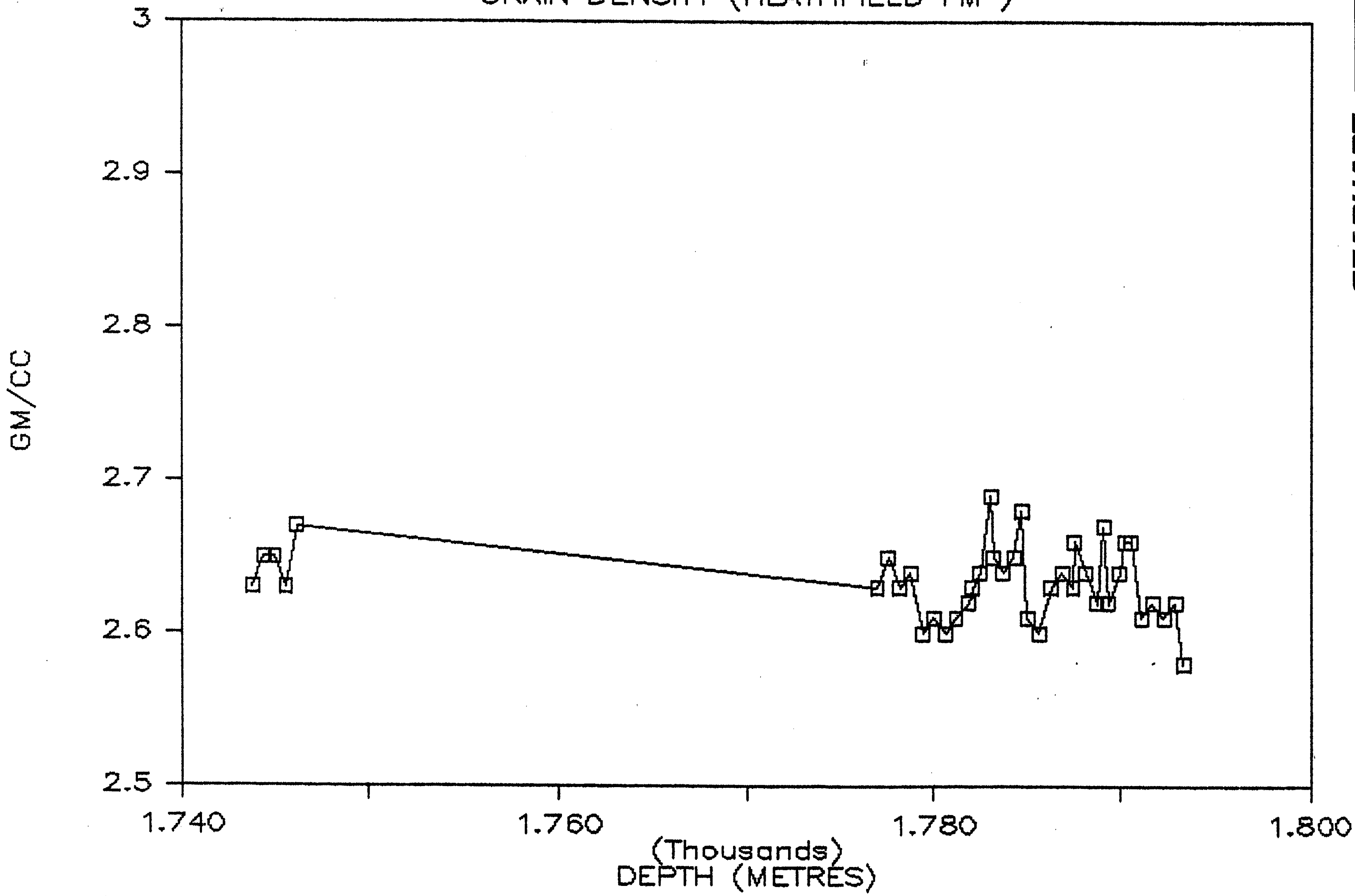
GEARHART AUSTRALIA



GEARHART AUSTRALIA

WINDERMERE NO 2

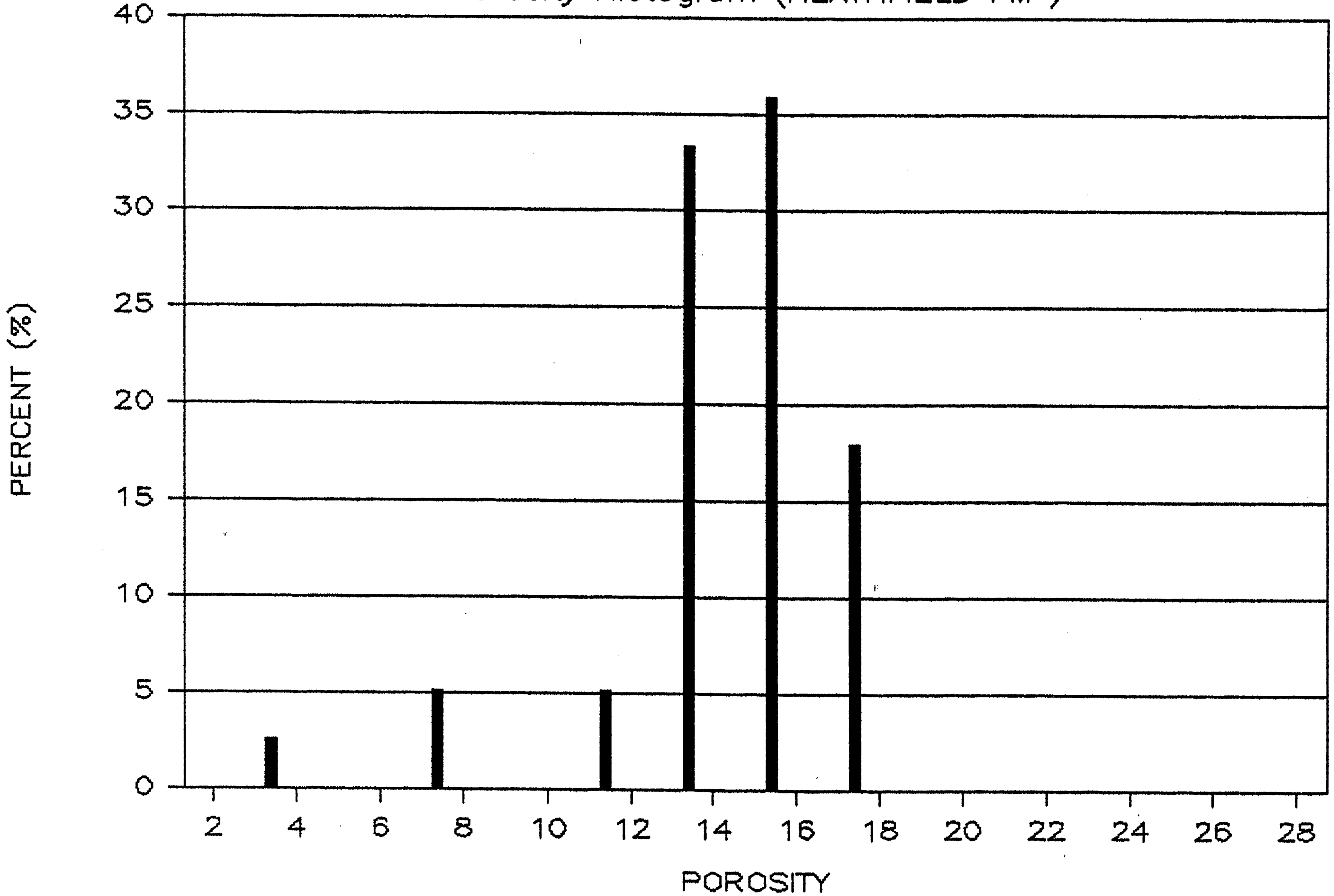
GRAIN DENSITY (HEATHFIELD FM)



GEARHART AUSTRALIA

WINDERMERE NO 2

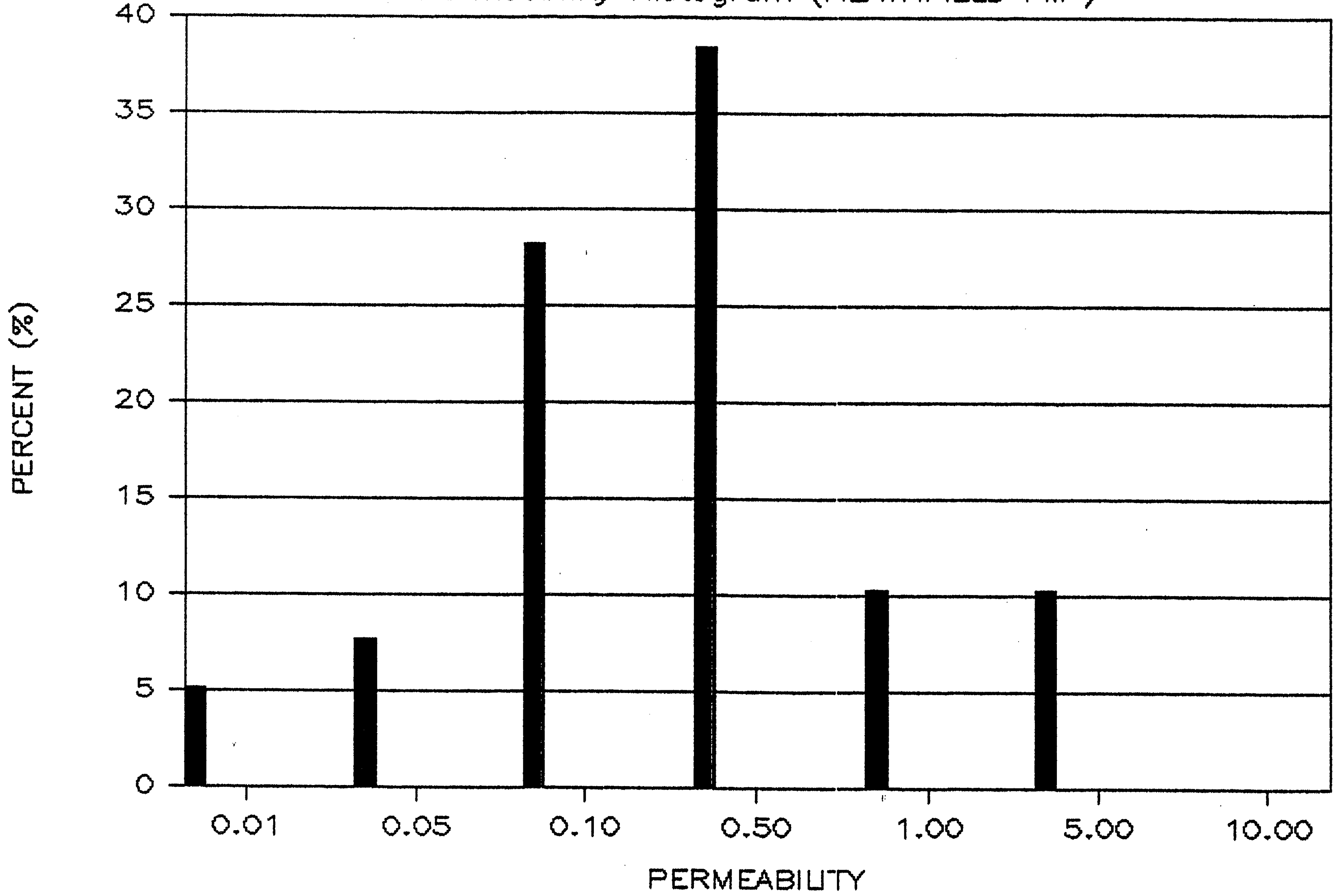
Porosity Histogram (HEATHFIELD FM)



GEARHART AUSTRALIA

WINDERMERE NO 2

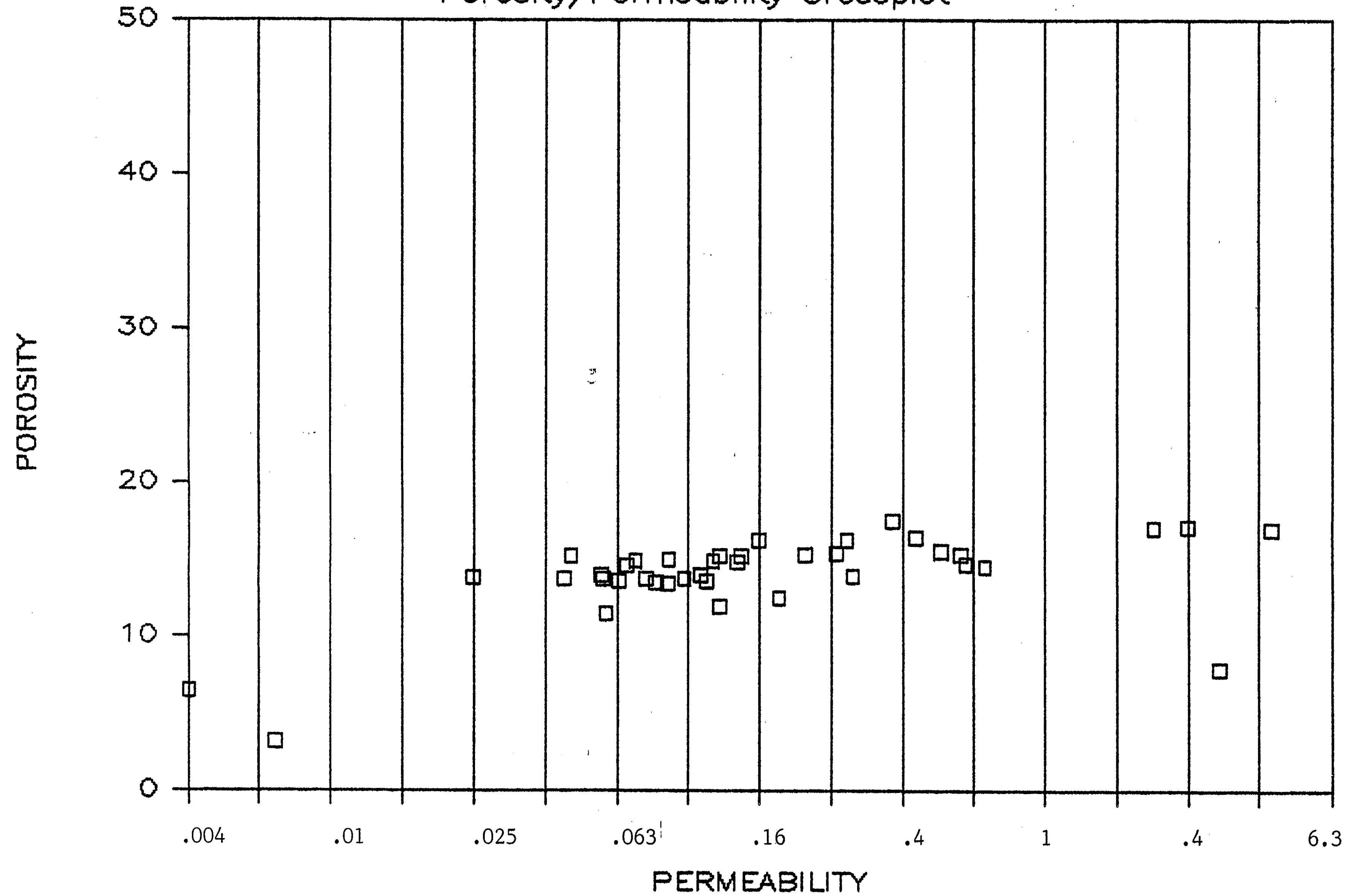
Permeability Histogram (HEATHFIELD FM)



GEARHART AUSTRALIA

WINDERMERE NO 2

Porosity/Permeability Crossplot



GEARHART AUSTRALIA

PE907879

This is an enclosure indicator page.
The enclosure PE907879 is enclosed within the container PE902151 at this location in this document.

The enclosure PE907879 has the following characteristics:

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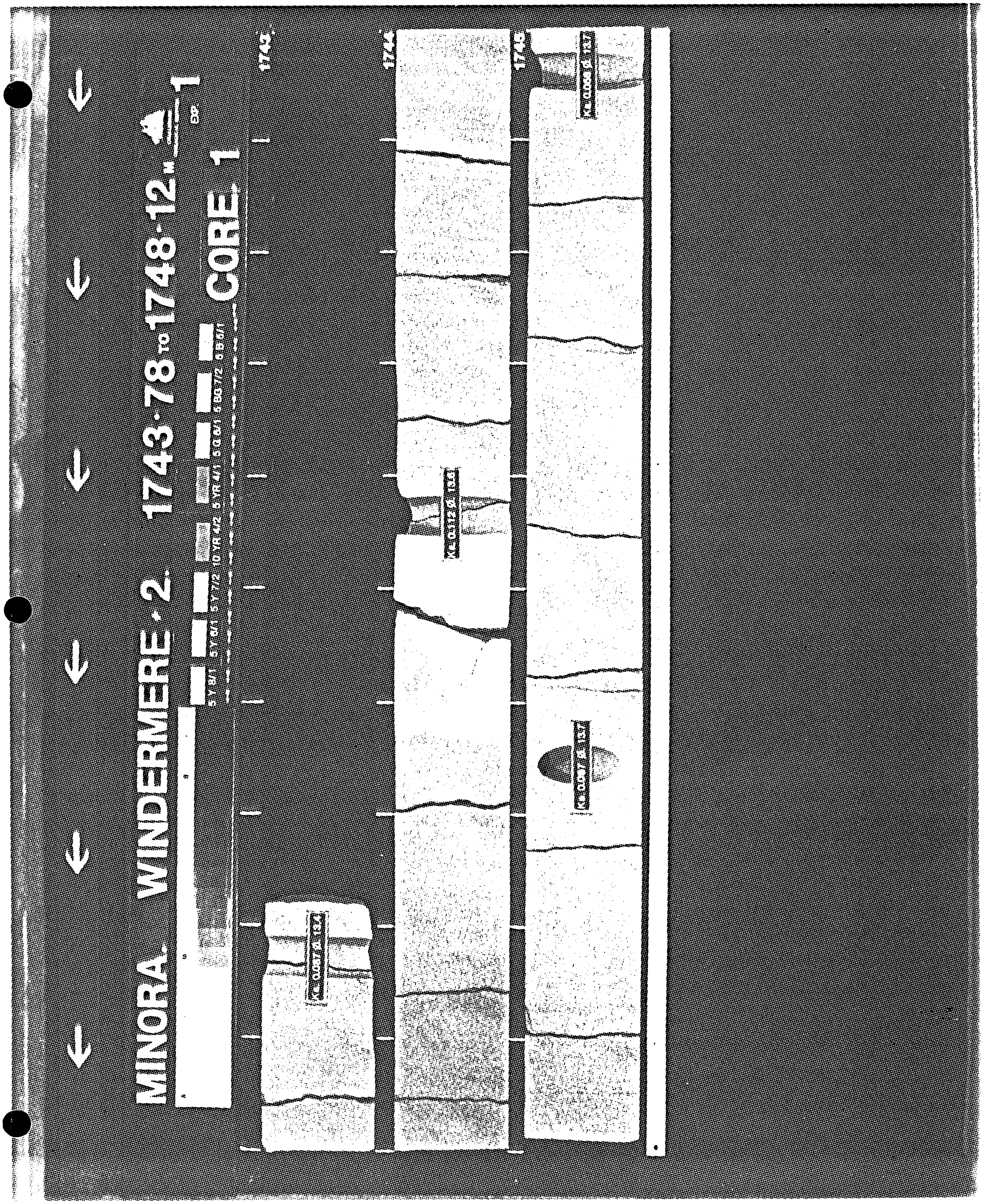
CONTAINER_BARCODE = PE902151
NAME = Core Photograph
BASIN = OTWAY
PERMIT = PEP 111
TYPE = WELL
SUBTYPE = CORE_PHOTO
DESCRIPTION = Core Photograph EXP 1 (Enclosure from Appendix F--Core Analysis--of Well Completion Report vol.2) for Windermere-2
REMARKS =
DATE_CREATED =
DATE_RECEIVED = 9/11/89
W_NO = W992
WELL_NAME = Windermere-2
CONTRACTOR =
CLIENT_OP_CO = Minora Resources NL

(Inserted by DNRE - Vic Govt Mines Dept)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CORE 1
5 Y 8/1 5 Y 6/1 5 Y 7/2 10 YR 4/2 5 YR 4/1 5 G 6/1 5 BG 7/2 5 B 6/1
1743
1744
1745

PE907880

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CONTAINER_BARCODE =	PE902151
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PERMIT =	PEP 111
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SUBTYPE =	CORE_PHOTO
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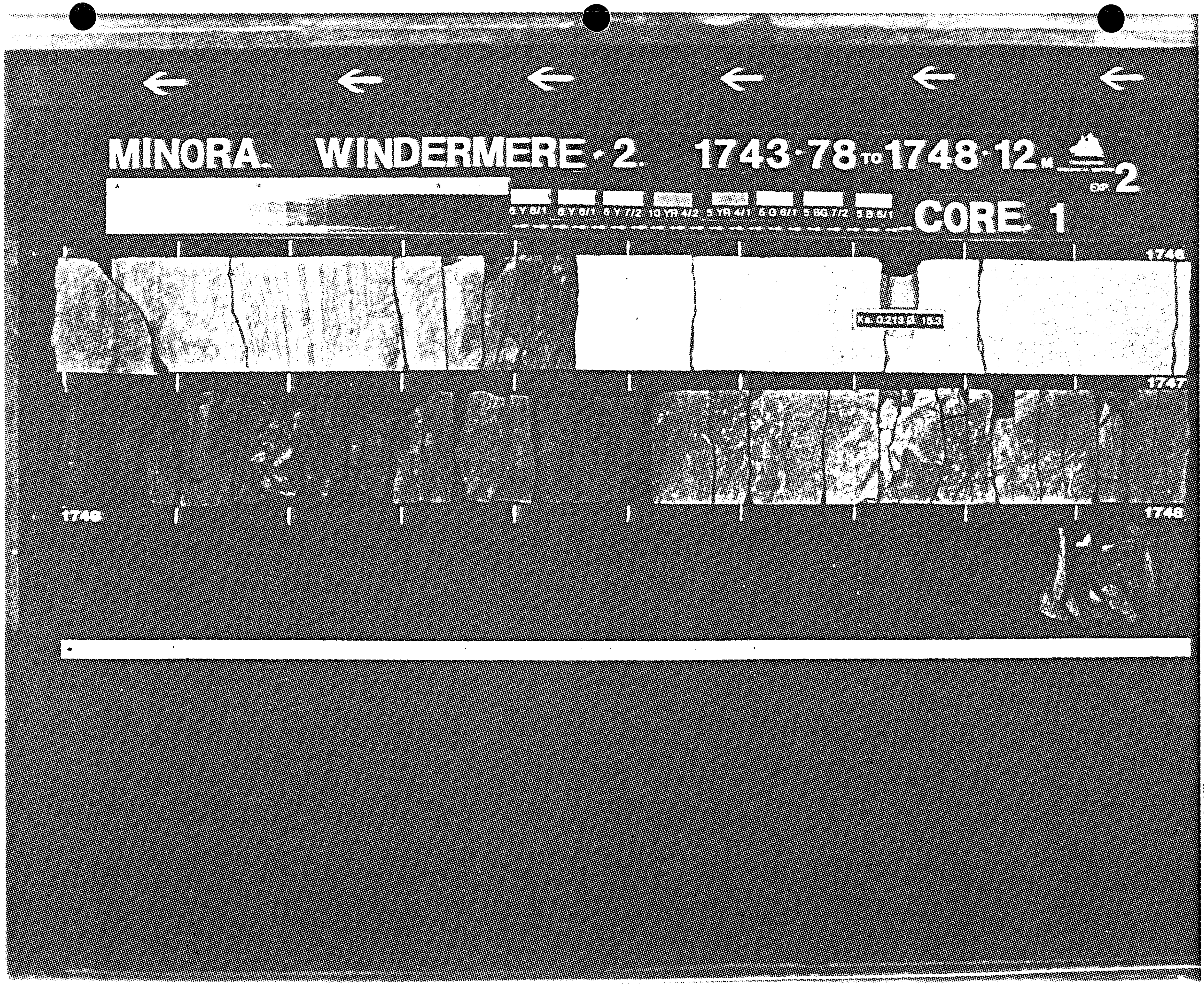
DATE_CREATED =	
DATE_RECEIVED =	9/11/89
W_NO =	W992
WELL_NAME =	Windermere-2
CONTRACTOR =	
CLIENT_OP_CO =	Minora Resources NL

(Inserted by DNRE - Vic Govt Mines Dept)


MINORA WINDERMERE - 2 1743·78 TO 1748·12 M
EXP. 2
CORE 1
5 Y 8/1 5 Y 6/1 5 Y 7/2 10 YR 4/2 5 YR 4/1 5 G 6/1 5 BG 7/2 5 B 6/1
Ka 0.213 Ø 15.3
1746
1747
1748

PE907881

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PERMIT = PEP 111
TYPE = WELL
SUBTYPE = CORE_PHOTO
DESCRIPTION = Core Photograph EXP 3 (Enclosure from Appendix F--Core Analysis--of Well Completion Report vol.2) for Windermere-2
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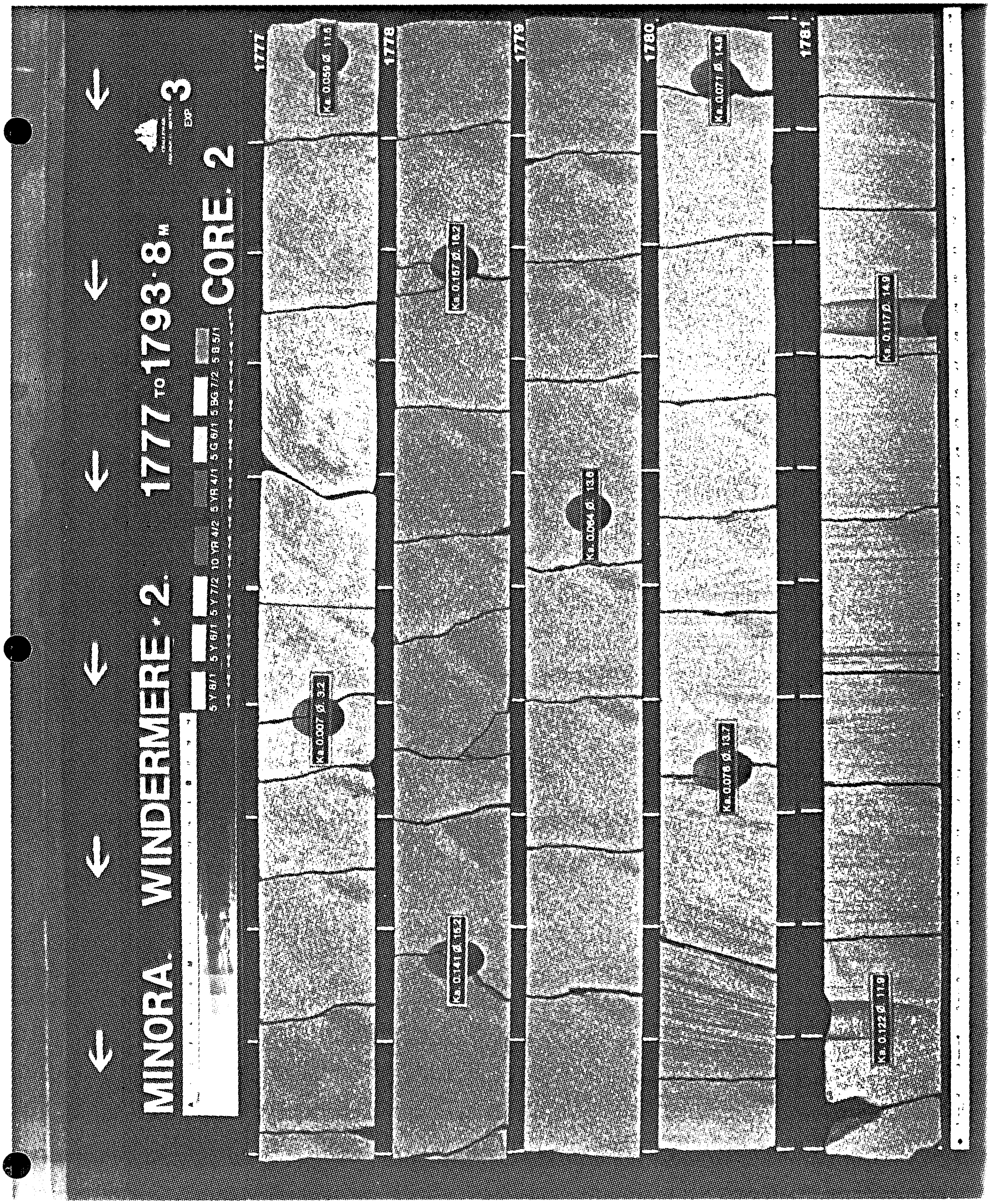
DATE_CREATED =
DATE_RECEIVED = 9/11/89
W_NO = W992
WELL_NAME = Windermere-2
CONTRACTOR =
CLIENT_OP_CO = Minora Resources NL

(Inserted by DNRE - Vic Govt Mines Dept)


MINORA. WINDERMERE # 2.
1777 TO 1793·8 M
CORE. 2
EXP 3
5 Y 8/1
5 Y 6/1
5 Y 7/2
10 YR 4/2
5 YR 4/1
5 G 6/1
5 BG 7/2
5 B 5/1
1777
1778
1779
1780
1781
Ka 0.050 Ø 11.5
Ka 0.007 Ø 3.2
Ka 0.107 Ø 16.2
Ka 0.141 Ø 16.2
Ka 0.064 Ø 13.6
Ka 0.071 Ø 14.9
Ka 0.076 Ø 13.7
Ka 0.117 Ø 14.9
Ka 0.122 Ø 11.9

PE907882

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CONTAINER_BARCODE = PE902151
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PERMIT = PEP 111
TYPE = WELL
SUBTYPE = CORE_PHOTO
DESCRIPTION = Core Photograph EXP 4 (Enclosure from Appendix F--Core Analysis--of Well Completion Report vol.2) for Windermere-2
REMARKS =
DATE_CREATED =
DATE_RECEIVED = 9/11/89
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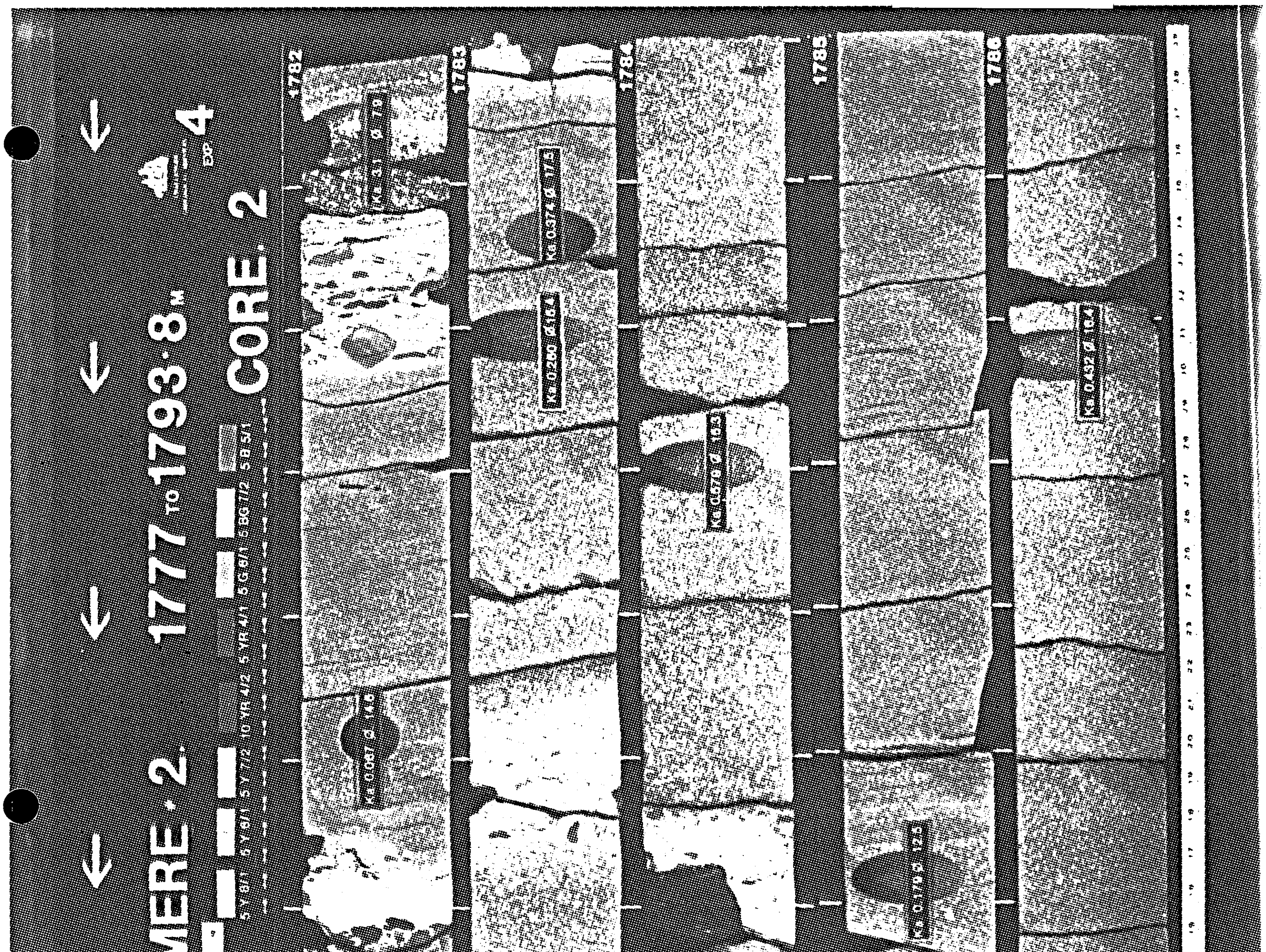
WELL_NAME = Windermere-2
CONTRACTOR =
CLIENT_OP_CO = Minora Resources NL

(Inserted by DNRE - Vic Govt Mines Dept)


MINORA. WINDERMERE - 2 1777 TO 1793·8 M
CORE 2
EXP 4
5 Y 8/1 5 Y 6/1 5 Y 7/2 10 YR 4/2 5 YR 4/1 5 G 6/1 5 BG 7/2 5 B 5/1
1782
1783
1784
1785
1786

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                    Appendix F--Core Analysis--of Well
                    Completion Report vol.2) for
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       CONTRACTOR =
     CLIENT_OP_CO = Minora Resources NL
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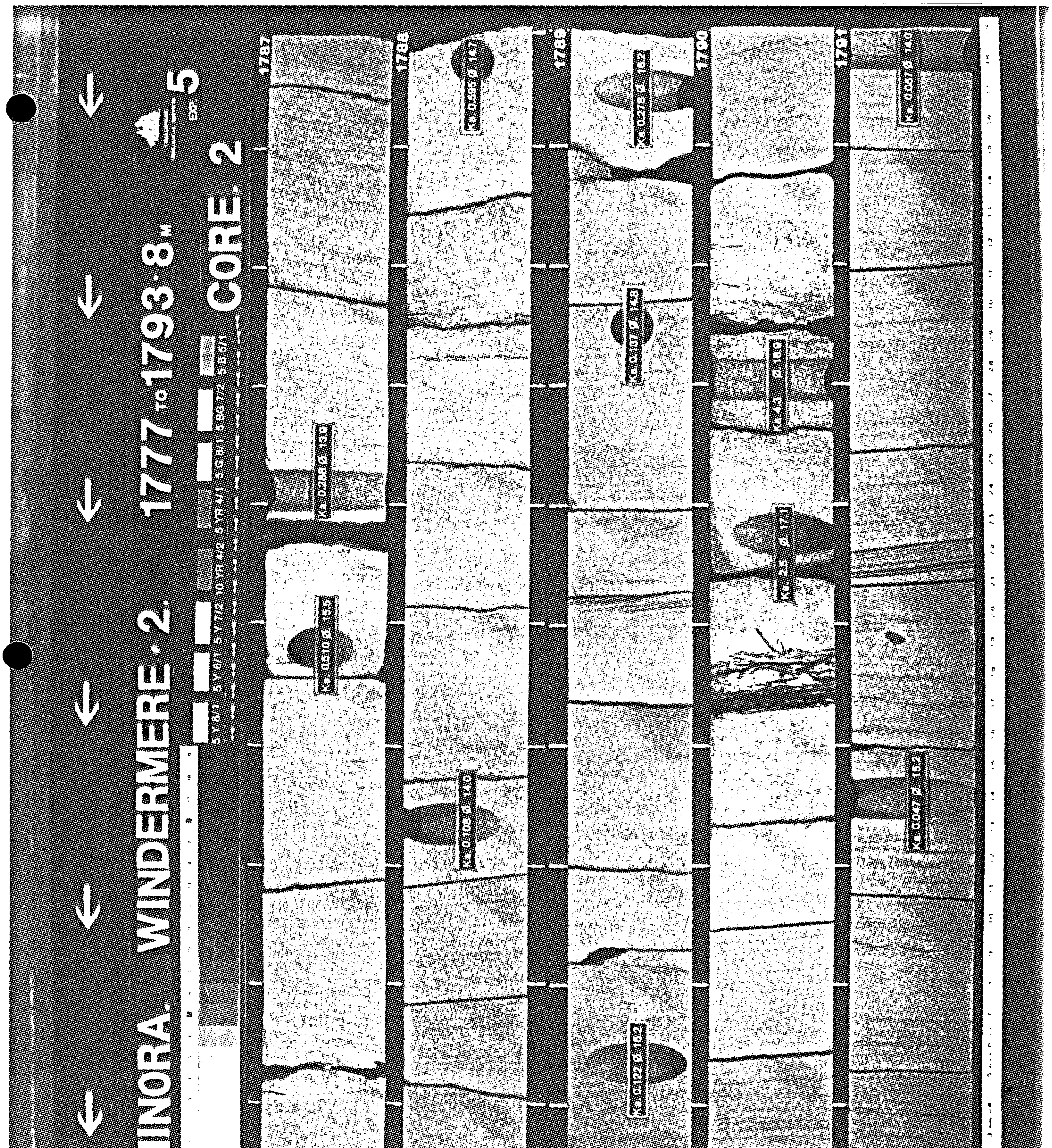
(Inserted by DNRE - Vic Govt Mines Dept)


MINORA. WINDERMERE # 2.
1777 TO 1793·8 M
CORE 2
EXP 5
5 Y 8/1 5 Y 6/1 5 Y 7/2 10 YR 4/2 5 YR 4/1 5 G 6/1 5 BG 7/2 5 B 5/1
1787
1788
1789
1790
1791

PE907884

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SUBTYPE = CORE_PHOTO
DESCRIPTION = Core Photograph EXP 6 (Enclosure from Appendix F--Core Analysis--of Well Completion Report vol.2) for Windermere-2
REMARKS =
DATE_CREATED =
DATE_RECEIVED = 9/11/89
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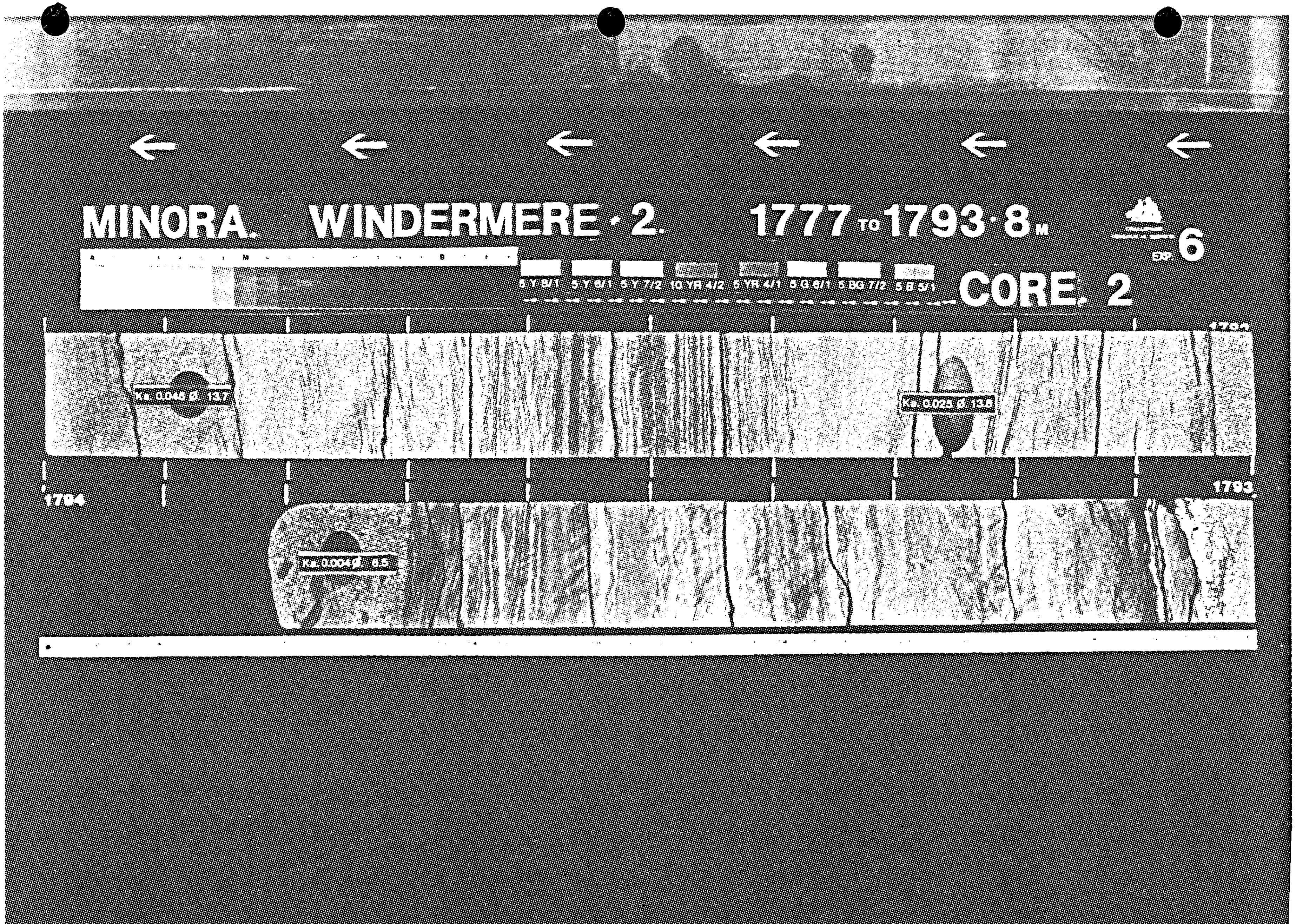
CONTRACTOR =
CLIENT_OP_CO = Minora Resources NL

(Inserted by DNRE - Vic Govt Mines Dept)


MINORA. WINDERMERE - 2. 1777 TO 1793·8 M
EXP. 6
CORE 2
5 Y 8/1
5 Y 6/1
5 Y 7/2
10 YR 4/2
5 YR 4/1
5 G 6/1
5 BG 7/2
5 B 5/1
Ka 0.046 Ø 13.7
Ka 0.025 Ø 13.6
Ka 0.004 Ø 6.5
1794
1793

APPENDIX G

APPENDIX G
PETROLOGICAL REPORT

Minora Resources N.L., 27-5-89

GPO BOX D164

Perth

WA 6001

1000 0 07 805

C/n

Preparation of seven thin sections ~~of~~

3 SWC,s and 4 coreplugs, Windermere No 2

R Townend

SUMMARY

Six of the seven intervals are similar, being very impure sands, containing high proportions of feldspar and lithic fragments. Many of these lithic fragments are feldspar-rich volcanics. They are classified as impure arenites rather than wackes although having more than 15% matrix, because this matrix is seen as authigenic. They are probably VOLCANOCLASTICS, based on the high volcanic lithic material, but also on the presence of apparent zeolites as an authigenic cement. They are ~~are~~ not classified as tuffs because volcanic debris in the matrix notably glass is lacking. Note that the zeolites may be derived from this source, and also the possibly magnesian clays/chlorite cement.

The extent of the authigenic activity, as the earlier deposited phyllosilicates, and the subsequent zeolite in some of the sands has resulted in very low porosities and permiabilities. There is another interval where carbonate cementation has produced the same result.

Sample Windermere 2 1746.24m

Lithology	LITHIC ARKOSIC ARENITE
Sorting	well sorted ,
Grainsize	medium sand, 0.25-0.4mm
Grainshape	subangular to subrounded, subhedral(feldspar)

Modal Constituents

FRAMEWORK	63.3%	
Quartz	10.4%	Monocrystalline,subangular, equant. grains rimmed by stained clay?
Feldspar	31.1%	Plagioclase=K feldspar,subhedral, fresh, rimmed by stained clay without penetration.Rare clinozoisite ex plag.
Lithic Fragments (ig)	32.1%	Feldspar porphyries with groundmass biotite common, stain for K feldspar. Fresh, subrounded. Less common type lacks mica.Uncommon plutonic textured feldspar fragments.
Lithic Fragments(mt)	24.9%	Mainly micaceous schists, and fine quartzites.
Chlorite	1.5%	Large single flakes, also rare Biotite.
Accessories	tr.	rare tourmaline, fine zircon.
MATRIX/CEMENT	36.7%	
Clay	91.1%	Brown stained ?smectite forming a ubiquitous coating to clasts, and expanding frequently to fill pores.The birefringent clay has a radial nature typical of authigenic formation.
Zeolite?	8.9%	Local poikilotopic cement totally fills pores between clay rims.

Diagenesis

There are two principal and quite separate cements formed authigenically.The main type is the brown coloured fibroradial ?smectitic clay that coats all clastic grains as a narrow rim even where clasts are almost touching, and often is more extensive filling a pore completely.The second and later authigenic cement is a minor phase but totally infilling pores between the clay rims,with a poikilotopic nature.Optically identified as a probable zeolite.

Porosity

Macroporosity was measured at 6.1%, as isolated but coarse pores.The clay rims to closely touching well packed subangular clasts, and the poikilotopic mineral have significantly reduced porosity.

PE907885

This is an enclosure indicator page.
The enclosure PE907885 is enclosed within the container PE902151 at this location in this document.

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                    (Enclosure from Appendix
                    G--Petrological Report--of Well
                    Completion Report vol.2) for
                    Windermere-2
          REMARKS =
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    DATE_RECEIVED = 9/11/89
             W_NO = W992
        WELL_NAME = Windermere-2
       CONTRACTOR =
     CLIENT_OP_CO = Minora Resources NL
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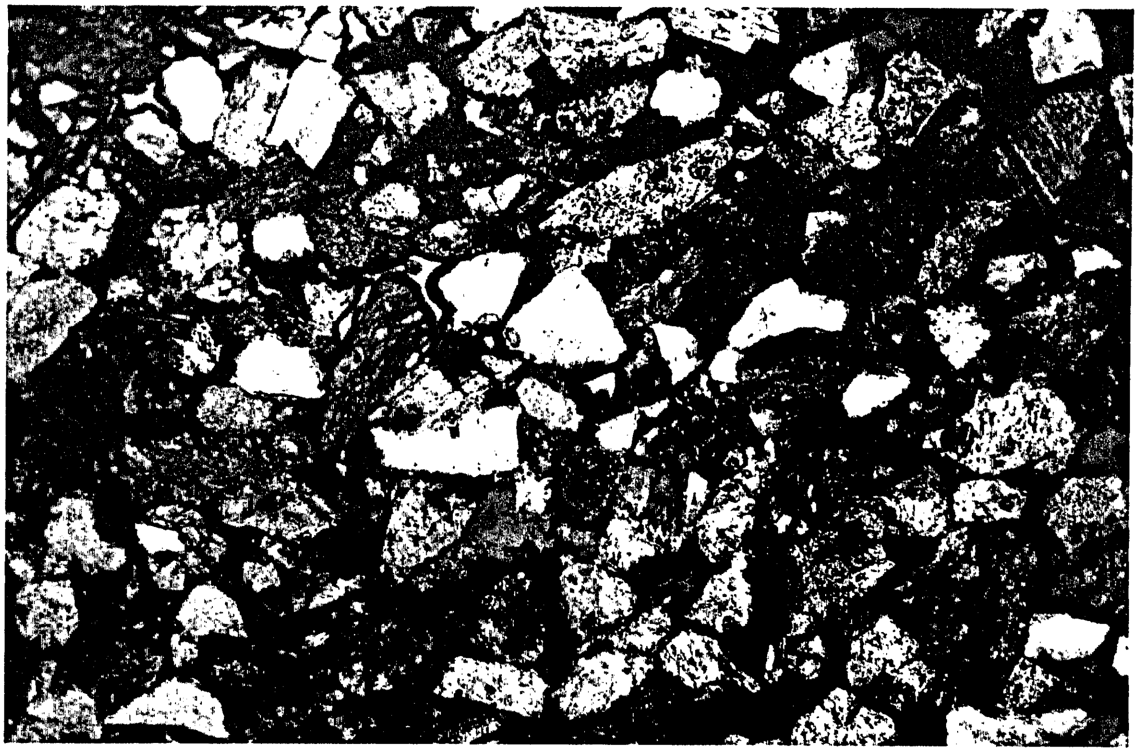
(Inserted by DNRE - Vic Govt Mines Dept)

PHOTO 1 WIND.2 1746M WELL SORTED QUARTZ DEFICIENT ARKOSIC LITHIC ARENITE,WITH OCCASIONAL MACROPORES.NIC UNC.FIELD WIDTH 1.8MM



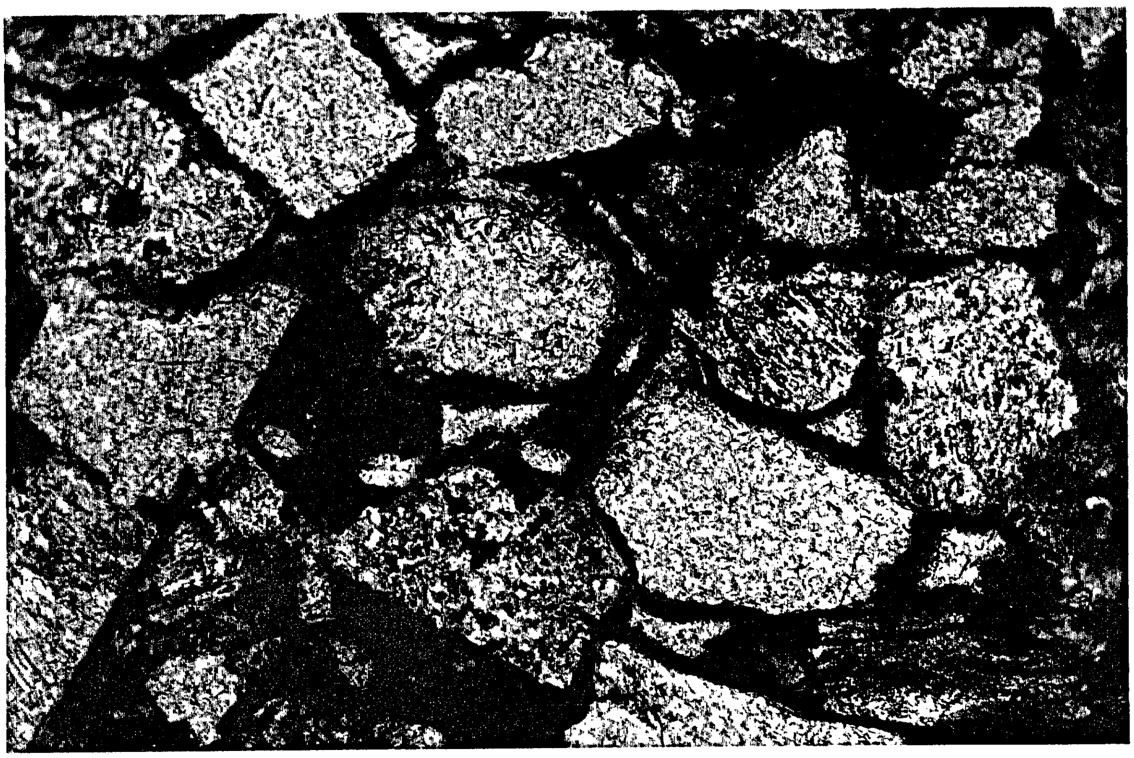


PHOTO 2 WIND. 2 1746M QUARTZ/FELDSPAR/LITHIC CLASTS RIMMED BY STAINED CLAY MATRIX,PLUS CLEAR ?ZEOLITE CEMENT.
NIC UNC. FIELD WIDTH 0.7MM

Sample Windermere No 2 1783.07m

Lithology	LITHIC ARKOSIC ARENITE	
Sorting	well sorted.	
Grainsize	medium sand,0.2-0.4mm	
Grainshape	subangular to subrounded,subhedral(feldspar)	

Modal Constituents

FRAMEWORK	76.3%	
Quartz	24.2%	Monocrystalline,subangular,equant. to elongate,rimmed byclay,no overgrowths
Feldspar	22.0%	Plagioclase=K feldspar,fresh crystals, medium sand, subrhombic to subrounded rimmed by radial clay.
Lithic Fragments(ig)	25.4%	Biotitic flow banded plagioclase volcanics, most aphyric, subrounded medium sand.Non biotite felsic lavas less common.
Lithic Fragments(mt)	27.9%	Mica schists,quartzite,chalcedony, chlorite quartzite,shales.subrounded.
Biotite	0.1%	Long fresh flakes against clast in place of clay rim.
Accessories	0.4%	Tourmaline , leucoxene.
MATRIX/CEMENT	23.7%	
Clay	83.4%	Clay forms ubiquitous rim of radial growths against clast contacts, also fills pores.Classified as possible smectite
Zeolite?	16.6%	Locally infills pores completely between clay rims,can be poikilotopic. Some evidence of replacement of clasts with former shapes preserved by clay haloes, now infilled.

Diagenesis

Identical to the 1746m interval,, with zeolite? more active, replacing clasts.

Porosity

Macroporosity measured at 11% but some of this probably induced.Authigenic clay and zeolite significantly reduce porosity.

PE907886

This is an enclosure indicator page.
The enclosure PE907886 is enclosed within the container PE902151 at this location in this document.

The enclosure PE907886 has the following characteristics:

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                    (Enclosure from Appendix
                    G--Petrological Report--of Well
                    Completion Report vol.2) for
                    Windermere-2
          REMARKS =
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    DATE_RECEIVED = 9/11/89
             W_NO = W992
        WELL_NAME = Windermere-2
       CONTRACTOR =
     CLIENT_OP_CO = Minora Resources NL
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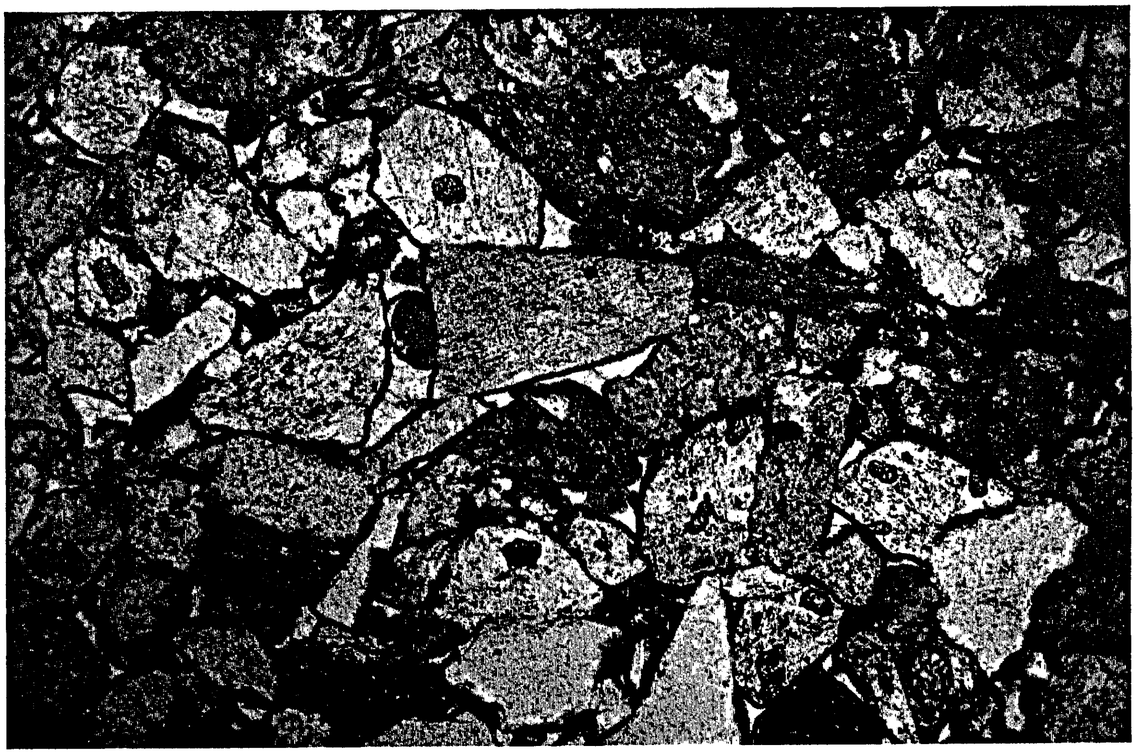
(Inserted by DNRE - Vic Govt Mines Dept)

PHOTO 3 WIND. 2 1783M WELL SORTED LITHIC ARKOSIC ARENITE SHOWING STAINED CLAY RIMS AND CLEAR ?ZEOLITE CEMENT. NIC UNC. FIELD WIDTH 1.8MM



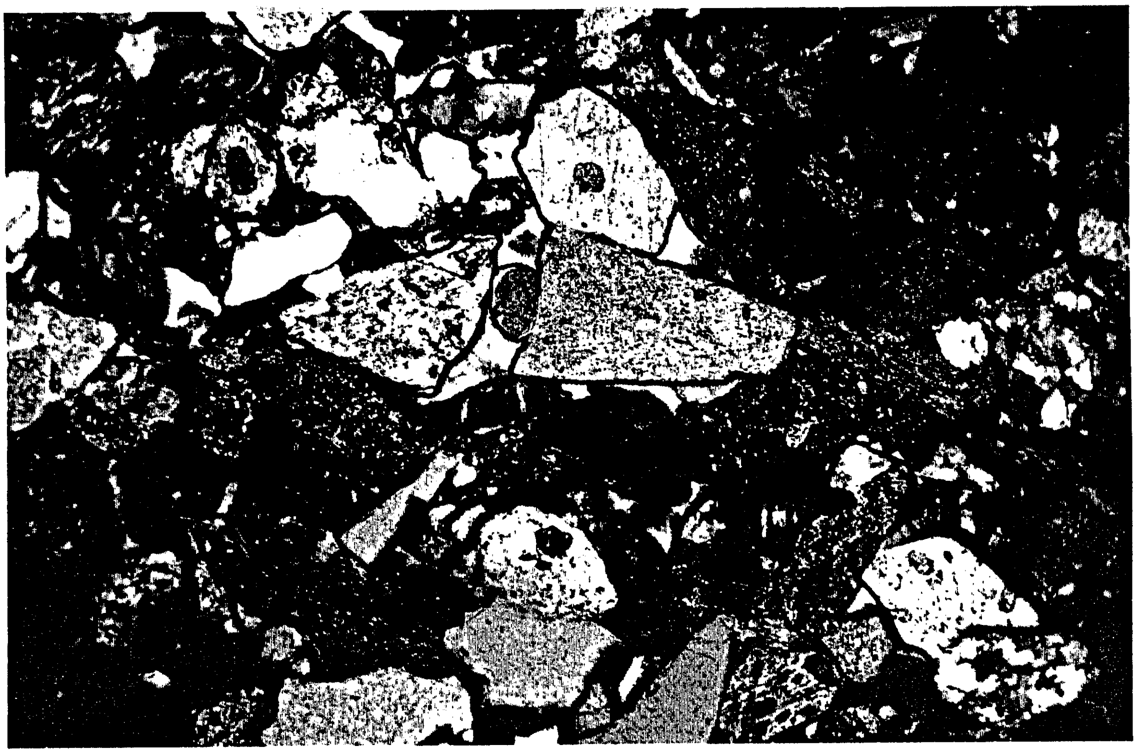


PHOTO 4 WIND. 2 1783M AS FOR PHOTO 3, SHOWING HETEROGENEOUS NATURE OF CLASTS. NIC CROS.FIELD WIDTH 1.8MM

Sample Windermere No 2 1790.26m

Lithology	LITHIC ARKOSIC ARENITE
Sorting	moderately sorted
Grainsize	medium to coarse sand.
Grainshape	angular to subrounded, subhedral (feldspar)

Modal Constituents

FRAMEWORK 71.5%

Quartz	31.6%	monocrystalline, equant to elongate,angular to subangular,coated by clay,overgrowths not visible.
Feldspar	30.8%	K feldspar>>plagioclase.K feldspar forms perthites to 1mm of subangular habit. Plagioclase subagular ,sub 0.5mm sericitic and replaced by clinozoisite.
Lithic Fragments(ig)	17.0%	Plutonic textured quartz two feldspar granite fragments>>volcanic of aphyric feldspar microlite dominance.Grains sub rounded.
Lithic Fragments(mt)	19.7%	Quartzite semi chert,equant=mica schists, elongate.Fine silt textured chips may be sediments, or tuffaceous seds, with rare example of possible welded silicified tuff.
Accessories	0.9%	Ores of isometric oxide type to 0.3mm

MATRIX/CEMENT 28.5%

"Clay"	70.1%	A fine radial fibrous textured rim to most clasts,classified as stained clay ,?smectite with a chlorite component,green tinged.Present between otherwise touching clasts.May be "isolated" by replacive zeolite of clast. Rarely coalesces to fill pores.
Zeolite?	29.1%	Zeolite forms poikilotopic crystals to 1mm across,penetrates behind clay rims.

Diagenesis

Quite similar to the previous interval, commonly showing penetration of zeolite within clay rims against clasts.

Porosity

Macroporosity measured at 5%, some is visible as pores following margins between adjacent clasts.Porosity considerably reduced by zeolite deposition.

PE907887

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PERMIT =	PEP 111
TYPE =	WELL
SUBTYPE =	CORE_PHOTO
DESCRIPTION =	Core Thinsection Photographs 5 & 6 (Enclosure from Appendix G--Petrological Report--of Well Completion Report vol.2) for Windermere-2
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	9/11/89
W_NO =	W992
WELL_NAME =	Windermere-2
CONTRACTOR =	
CLIENT_OP_CO =	Minora Resources NL

(Inserted by DNRE - Vic Govt Mines Dept)

PHOTO 5 WIND. 2 1790M MODERATELY SORTED LITHIC ARKOSIC ARENITE.
NIC UNC. FIELD WIDTH 1.8MM

PHOTO 6 WIND. 2 1790M POIKILOTOPIC ?ZEOLITE CEMENT TO MIXED CLASTS. NIC CROS. FIELD WIDTH 0.7MM

Sample Windermere No 2 1793.35m

Lithology	GREYWACKE	
Sorting	poor ,	
Grainsize	fine to very coarse sand.	
Grainshape	angular to subangular,>>subrounded.	

Modal constituents

FRAMEWORK	56.0%	
Quartz	20.2%	Monocrystalline>polycrystalline.Grains 0.1-1mm, angular common, subrounded rare elongate=equant.Orientation of slivers moderate.Overgrowths not visible.
Feldspar	13.7%	K feldspar>plagioclase,fine to medium sand, subhedral to angular.K feldspar fresh, some porosity,coarser than less fresh saussuritic plag.
Lithic Fragments(ig)	28.0	Aphyric altered felsic volcanics sub-angular,0.2-0.5mm,trachytic,rarely porphyritic, second group very biotitic. rare plutonic quartz feldspar composites
Lithic Fragments(mt)	35.7%	Foliated mica semi-schists common. Major lithology is a large argillaceous poorly foliated granule size masses. uncommon cherty quartz.
Micas	0.6%	Biotite narrow or wide flakes, slight alteration. some porosity in cleavages. Muscovite similar habit,less common.
Chlorite	1.2%	Aggregates.
Accessories	0.6%	Tourmaline, equant, some opaques prob carbonaceous.
MATRIX/CEMENT	44.0%	
		Fine silt (quartz phyllosilicate etc) uniformly dispersed,probably grades into clasts.Poorly bedded.

Diagenesis

Argillaceous matrix likely to be clastic in origin with authigenic activity limited by lack of primary porosity.

Porosity

Sporadic primary /secondary porosity visible, much likely to be induced,sediment essentially impervious.

PE907888

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                    (Enclosure from Appendix
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                    Windermere-2
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       CONTRACTOR =
     CLIENT_OP_CO = Minora Resources NL
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(Inserted by DNRE - Vic Govt Mines Dept)

PHOTO 7 WIND. 2 1793M POORLY SORTED LITHIC ARKOSIC SANDSTONE/ GREYWACKE. NIC UNC. FIELD WIDTH 1.8MM

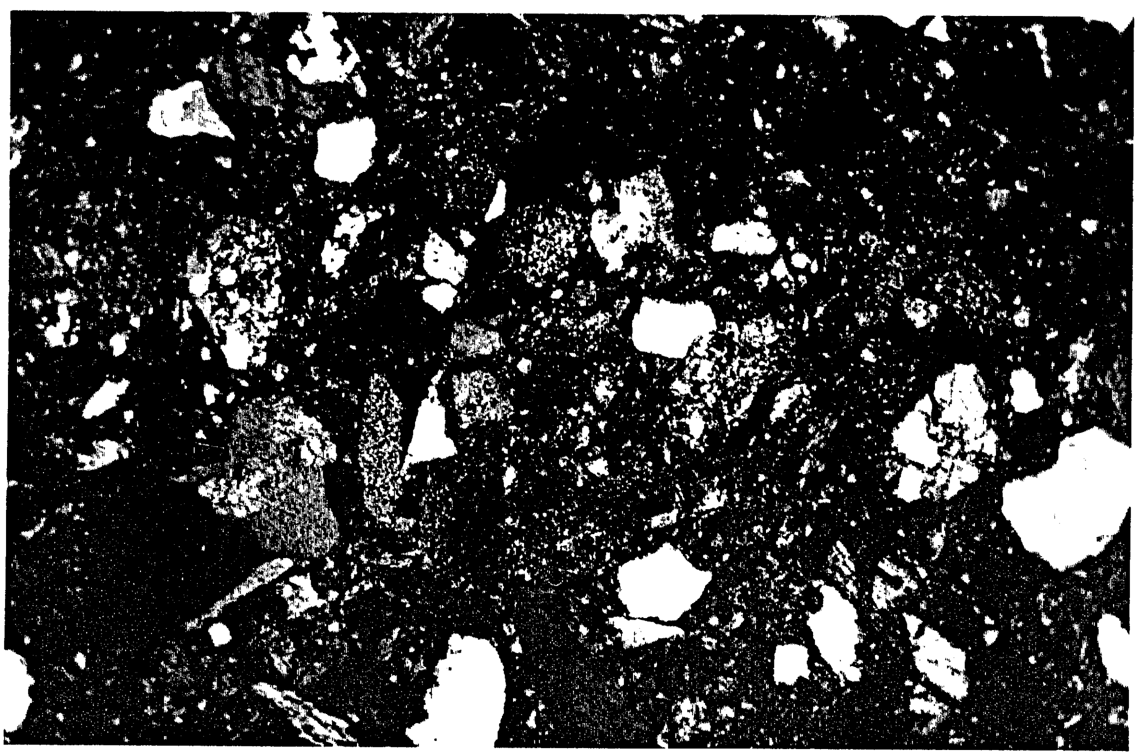

PHOTO 8 WIND. 2 1793M HETEROGENEOUS CLASTS IN GREYWACKE? NIC CROS. FIELD WIDTH 1.8MM

Sample Windermere No 2 2531m SWC.

Lithology	CARBONATE CEMENTED LITHIC ARKOSIC ARENITE	
Sorting	well sorted	
Grainsize	fine to medium sand	
Grainshape	angular to subrounded,rare subhedral.	

Modal Constituents

FRAMEWORK	68.7%	
Quartz	34.9%	Monocrystalline,0.2-0.4mm,commonly angular due to corrosion by carbonate.
Feldspar	29.1%	K feldspar=plagioclase, dimensions as quartz.Habits subhedral to subrounded, part replacement by carbonate common.
Lithic Fragments(IG)	17.1%	Feldspar-rich aphyric volcanics common, some chloritic with leucoxene.habit subrounded.
Lithic Fragments(mt)	17.7%	Micaceous quartzite,phyllites,cherts? dimensions as quartz.
Biotite	0.6%	coarse twisted fresh flakes to 0.4mm.
Accessories	0.6%	Leucoxene aggregates.
MATRIX/CEMENT	31.3%	
Carbonate	51.4%	Locally dominant semi poikilotopic totally infilling pores, and part replacing feldspar>quartz, penetrates cleavages of former.
Chlorite	38.6%	Locally extensive replete with sec.TiO_2 breakdown of mica.
Mica/Clay	10%	Sericitic patches without foliation, infilling primary pores.

Diagenesis

Authigenic carbonate commonly totally infilled pores and partly replaced silicate clasts.Breakdown of biotite produced porefilling chlorites.Sericitic/?illitic clay deposited evenly separately from carbonate, ex ?solution, little corrosion of clasts.

Porosity

Least fractured parts of small chip with dominant carbonate cement show negligible macroporosity.

PE907889

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CONTRACTOR =
CLIENT_OP_CO = Minora Resources NL

(Inserted by DNRE - Vic Govt Mines Dept)

PHOTO 9 WIND. 2 2531M CARBONATE CEMENTED ARENITE. NIC CROS.
FIELD WIDTH 1.8MM

PHOTO 9 WIND. 2 2531M CARBONATE PARTLY REPLACING FELDSPAR IN
IN LITHIC ARKOSIC ARENITE. NIC CROS. FIELD WIDTH 0.7MM

Sample Windermere No 2 3190m SWC

Lithology	LITHIC ARKOSIC ARENITE
Sorting	moderately well sorted
Grainsize	very fine to medium sand
Grainshape	angular to subhedral, and subrounded.

Modal constituents

FRAMEWORK 56.9%

Quartz	40.0%	Monocrystalline,0.15-0.4mm,angular -sub. rounded,some corrosion by cement,Overgrowths not visible.
Feldspar	20.2%	Plagioclase> K feldspar(microcline).Subhedral most fresh well twinned plag.K feldspar sub hedral to angular,fresh.Some corrosion by clay matrix.
Lithic Fragments(IG)	19.6%	Aphyric to porphyritic feldspar dominant volcanics,(Plagioclase> K feldspar). Plag. sometimes sericitic.
Lithic Fragments(mt)	19.6%	Quartzite, deformed,Mica schist, chert or felsic volc. groundmass?
Micas	0.6%	Biotite>Muscovite.
Accessories	tr.	Opaques,?carbonaceous

MATRIX/CEMENT 43.1%

Clay	88.5%	Stained Clay ubiquitous as rim to clasts, and occasionally infilling pores.May be a deposited from solution , although the biotite has an identical polarising colour. Little apparent corrosion of clasts.
Opaques	11.5%	Locally prevalent as pore filling irregular ?carbonaceous material.

Diagenesis

The principal diagenetic activity was the formation of the brown tinted phyllosilicate deposited as a rim to all clasts. Its ubiquity,pervasiveness and very fine texture without foliation,supports deposition from solution.Reaction with feldspar bearing clasts insignificant.

Porosity

There is some macroporosity within the clay filled pores, but permiability appears to be very low owing to the extent of the extent of the cement.

PE907890

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CONTRACTOR =
CLIENT_OP_CO = Minora Resources NL

(Inserted by DNRE - Vic Govt Mines Dept)

PHOTO 11 WIND. 2 3190M CLAY RIMMING AND CEMENTING WELL SORTED LITHIC ARKOSIC ARENITE. NIC UNC. FIELD WIDTH 0.7MM

Sample Windermere No 2 3191m SWC

Lithology	LITHIC ARKOSIC ARENITE	
Sorting	well sorted	
Grainsize	fine to medium sand.	
Grainshape	angular to subrounded,subhedral(feldspar)	

Modal Constituents

FRAMEWORK 66.5%

Quartz	32.8%	Monocrystalline,>Polycrystalline 0.15-0.4mm angular to subrounded.Some corrosion by cement.No evidence of overgrowths.
Feldspar	29.9%	Plagioclase>K feldspar,subhedral rhombic xls dominant, others show corrosion by matrix. dimensions mainly 0.2-0.4mm.Interiors fresh apart from rare carbonate part replacement.
Lithic fragments(IG)	18.9%	Feldspar porphyries dominant,plagioclase> K feldspar, some chloritic,interior fresh. dimensions as quartz,most angular.
Lithic Fragments(mt)	15.9%	Mainly micaceous schists and fine quartzite.
Micas	1.0%	Biotite>Muscovite. Large equant flakes or narrow flakes deformed against clasts. Some relic flakes mainly chlorite.
Accessories	1.5%	Garnet fragmented,leucoxene.

MATRIX/CEMENT 33.5%

"Clay"	Rims of radially textured clay deposited on clast margins.Low birefringence suggests a high kaolin content or it is chloritic. Commonly it expands to fill pores.

Diagenesis

The only significant activity is the deposition of the clay whose texture as in previous samples is indicative of an authigenic nature, probably from solutions.Corrosion of clasts is low.

Porosity

In the least fractured part of the slide, the macro-porosity visible is negligible due to the ubiquity of the cement filling all cavities and pores between the clasts.

PE907891

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                    Completion Report vol.2) for
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       CONTRACTOR =
     CLIENT_OP_CO = Minora Resources NL
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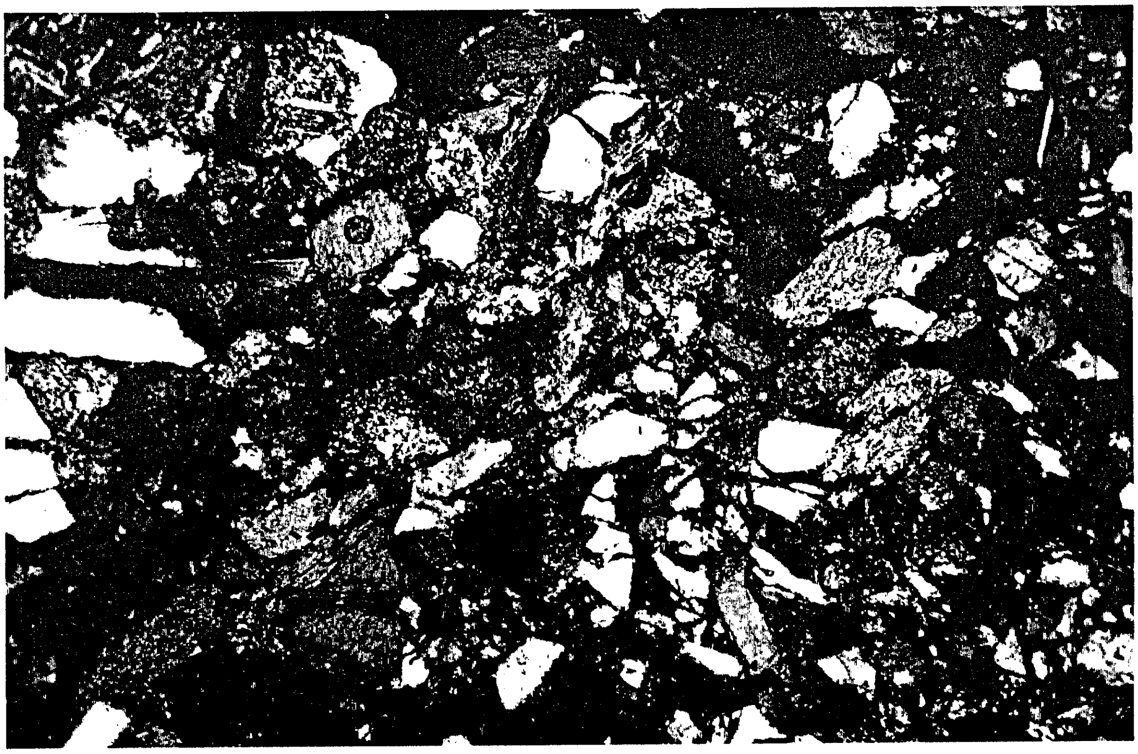
(Inserted by DNRE - Vic Govt Mines Dept)

PHOTO 12 WIND. 2 3191M WELL SORTED LITHIC ARKOSIC ARENITE.
NIC CROS. FIELD WIDTH 1.8MM



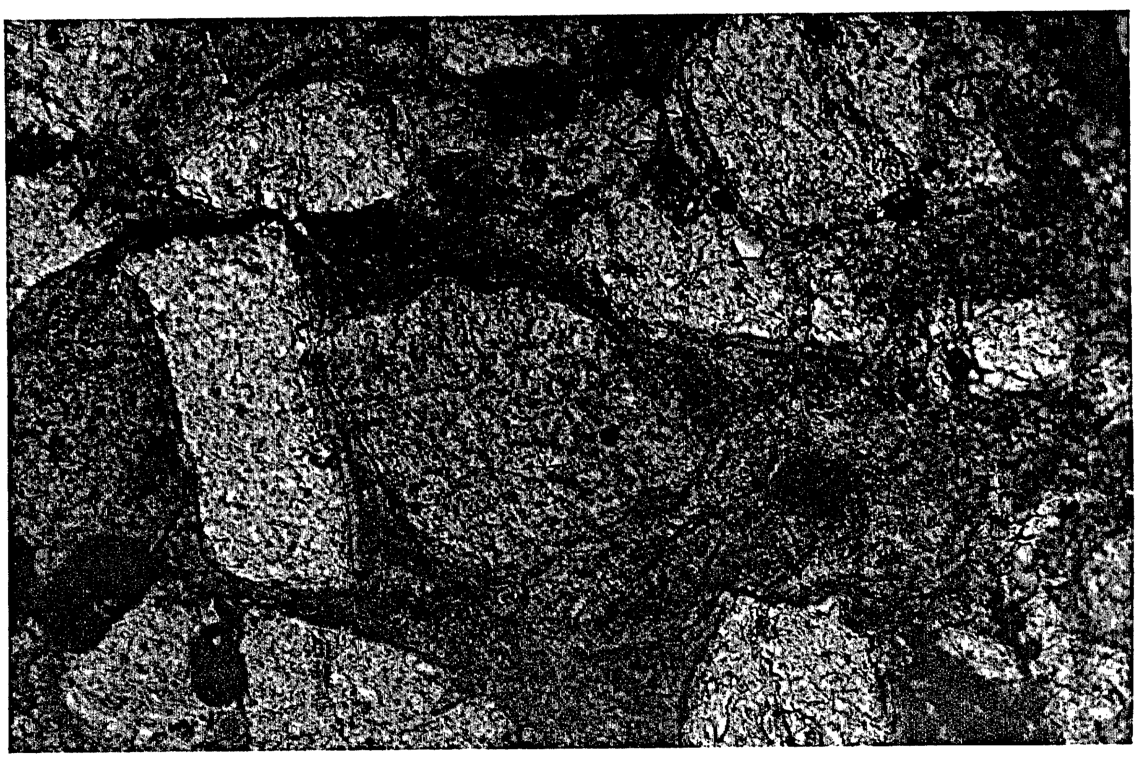


PHOTO 13 WIND. 2 3191M CLAY RIMMING ALL CLASTS AND FILLING
PORES. NIC UNC. FIELD WIDTH 0.7MM

Mr I.Copp, 25-10-89

Minora Resources N.L.,

263 Adelaide tce,

Perth

1000 0 07 1056

o/n 0224

SEM /EDS examination of two thin sections.

Windermere No 2.

R Townend

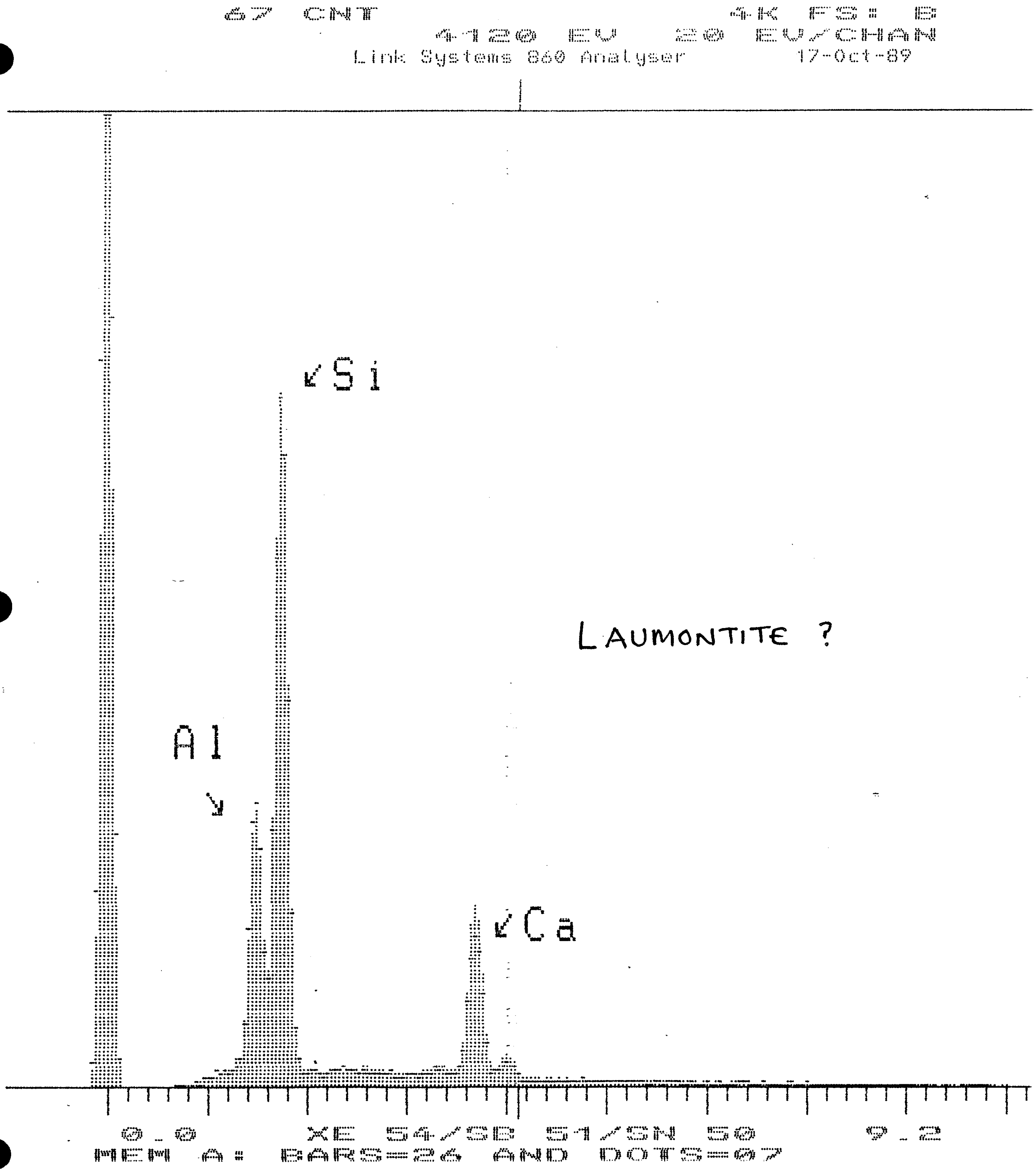
Introduction

Previous petrographic examination of various thin sections from Windermere No 2 had postulated the presence of zeolites as cement in some of the sands. It was requested that further work be carried out to confirm this.

Results

Two slides (Wind. 2 1783.07 and 1790.26m) were selected for further work. Using the optical microscope, areas of possible zeolite were marked with lead arrows and examined by the SEM/EDS.

The marked minerals had identical chemistry ,high Si,moderate Al and low Ca.(see attached charts). Combined with the optical data(inclined extinction,mod. birefringence,two cleavages), this suggested LAUMONTITE as the zeolite species.


67 CNT
4K FS: 8
4120 EV 20 EV/CHAN
Link Systems 860 Analyser 17-Oct-89
Si
Al
Ca
LAUMONTITE ?
0.0
XE 54/SB 51/SN 50
9.2
MEM A: BARS=26 AND DOTS=07

APPENDIX H

APPENDIX H

WIRELINE LOG INTERPRETATION

WINDERMERE #2 - LOG ANALYSIS

INTRODUCTION

The wireline log analysis of Windermere #2 was made on a Macintosh SE computer utilizing the Maclog log evaluation programme.

Interpretations were made of selected intervals in the Heathfield Member, the Lower Eumeralla Subunit, the Windermere Member and the Crayfish Formation.

Because of bad hole conditions which seriously affected the density / neutron log over particular zones of interest the log analysis was done using Sonic-Gamma Ray and DLL-MSFL only.

The Gearhart wireline logs available for log analyses were:

Run 1	DLL/MSFL/GR/SP/Cal	304.7-1855.4m.
	BHCS/GR/MEL/Cal	15.1-1856.0m.
Run 2	DLL/MSFL/GR/SP/Cal	1865.5-3594.8m.
	BHCS/GR/MEL/Cal	1865.5-3558.0m.
	SLD/CNS/PE/GR/Cal	1865.5-3594.7m.

0-1867.5 metres

After setting $13^3/_8$" casing at 314.2 metres $12\frac{1}{4}$" hole was drilled to 1743.8 metres and $8\frac{1}{2}$" hole to 1867.5 metres. Cores were cut from 1743.8-1749.3 and 1770.0-1793.9 metres (drillers depths) which correspond to depths of 1744.8-1750.3 and 1771.0-1794.9 metres (wireline logs).
DST #1 over the interval 1775.2-1802.3 metres recovered 299 metres of mud and muddy formation water - Rw=0.3 ohm-m @ 70°F. This compares favourably with a Windermere-1 Heathfield water Rw of 0.286 at 25°C obtained during production testing which resulted in a total of approximately 73 barrels of formation water being produced during swabbing operations.

Run 1 of wireline logs was conducted at 1867.5 metres. No hole problems were experienced while logging and the caliper log showed the hole to be fairly well to gauge through the Heathfield Member and Middle-Upper Eumeralla Subunits, but above 1020 metres the hole was up to 5 inches (125mm) over-gauge.

1867.5-3595.0 metres

After logging, $8\frac{1}{2}$" hole was then drilled to a total depth of 3595 metres. No further conventional cores were cut. One successful bottom hole drill stem test was run over the interval 3174.0 - 3230.7 metres and recoverd slightly gas cut water cushion with a trace of oil.

Run 2 of wireline logs was conducted at 3595 metres. Severe hole problems were experienced while logging and several clean-out trips were necessary. The caliper log showed the hole to be rugose and 1-10" (25-250mm) over-gauge throughout, except for the bottom 200 metres where the hole was generally 0-1" (0-25mm) over-gauge.

The rugosity caused the tools to "stick and jump" while logging and this particularly affected density readings resulting in poor and un-useable data. Unfortunately the Windermere Member at 3187-95 metres was the most over-gauge section in the well with hole sizes of 14-18" (350-450mm) and as a result the density/neturon data through the zone are virtually useless.

The affects on the Sonic and DLL/MSFL logs were less although some data values were questionable. There is some cycle skipping on the Sonic Log and the Microspherically Focused Log sometimes has anomalously low values in the over-gauge sections.

METHOD

Wireline log data was selectively read from the logs and inputted into the programme.

The following parameters were used for all zones:

Surface Depth	0 metres
Total Depth	3595 metres
Surface Temperature	70 F
Bottom Hole Temperature	280 F (Estimated from logs)
Mud filtrate density	1.00

Other specific parameters used on individual zones are listed on the evaluation sheet.

V-Clay

The volume of clay was calculated by three methods:

Gamma Ray Vclay=(GRlog - GRmin)/(GRmax-GRmin)
Dens/Neut Vclay=(RHOma-RHMAclean)/(RHMAclay-RHMAclean)
Resistivity Vclay=Rclay/Rt if 0.4 <=Rclay/Rt <=1.0 otherwise
Vclay=0.452 + 0.105xlnRclay/Rt if Rclay/Rt <0.4

The lowest value from the three methods was then used as V-clay. (In practice since the evaluation utilized the sonic and resistivity logs the density-neutron was not used and V-clay was the lower of the gamma ray or resistivity values, generally the gamma ray.)

Porosity

Porosity was calculated from the sonic log using the Total-CFP Sonic Porosity Transform where: Por.=1 - (Deltatma/Deltat)^(1/X) and Deltatma=54usecs/ft. and x=1.6. This method was used because the density/neutron log values are unreliable over several of the zones of interest.

Water Saturation

Water saturations were calculated using the Schlumberger Indonesian Equation.

Apparent water resistivity (Rwa) values were obtained from the Hingle Plots which suggested a common water resistivity of about 1.0 ohm-m @ 75°F and this value, (adjusted for temperature) was used in all evaluations. This contrasts with a measured value of 0.3 ohm-m @ 70°F on water recovered from DST #1 of the lower Heathfield Member and is probably as a result of clay and other constituents present in the sand. As a comparison, log interpretation was also conducted over the Heathfield zones at an Rw of 0.29 ohm-m @ 75°F reflecting the resistivities obtained from DST-1 and whilst swabbing Windermere-1. Rmf values used were taken from measured values (logs) adjusted to formation temperatures.

RESULTS (see also attached sheets and plots).

Heathfield Member (Rw 1.0ohm-m @75°F) 1671-1806m

GR clean	30 API units
GR clay	120 API units
Rt clay	4 ohm-metres
Rw (from Rwa)	0.40 ohm-metres
Rmf	0.09 ohm-metres

1671-1701m	Porosity	13-16%
	Water saturation	85-100%
	Clay content	30-60%
1720-1748m	Porosity	10-14%
	Water saturation	75-95%
	Clay content	30-50%
1760-1806m	Porosity	10-13%
	Water saturation	70-90%
	Clay content	40-55%

Heathfield Member (Rw 0.29ohm-m @75°F) 1671-1806m

GR clean	30 API units
GR clay	120 API units
Rt clay	4 Ohm-metres
Rw (from DST-1)	0.14 Ohm-metres
Rmf	0.09 Ohm-metres

1671-1701m	Porosity	13-16%
	Water saturation	60-90%
	Clay content	30-60%
1720-1748m	Porosity	10-14%
	Water saturation	55-65%
	Clay content	35-50%
1760-1806m	Porosity	10-13%
	Water saturation	55-70%
	Clay content	40-55%

Prior to logging two cores were cut, (1744.8-1750.3 and 1771.0-1794.9 metres logs), and a drill stem test had been run to evaluate the basal Heathfield Member sand. The drill stem test over the interval 1775.2 - 1802.3 metres recovered 299 metres of mud and muddy water (Rw=0.3 ohm-m @ 70F) but no gas or oil indicating that the zone had a high water saturation. Measured core porosities in the Lower Heathfield were generally 13-16% compared to log derived porosities of 10-13%.

<u>Lower Eumeralla Subunit</u> <u>2529-2547m</u>

GR clean	30	API units
GR clay	140	API units
Rtclay	20	ohm-metres
Rw (from Rwa)	0.34	ohm-metres
Rmf	0.80	Ohm-metres

2529-2547m	Porosity	5.5-9.5%
	Water Saturation	70-100%
	Clay content	30-40%

In cuttings and sidewall cores the interval 2529-2547m is predominantly sandstone, clear, white, pale green, pale orange-pink, very fine to medium, mostly fine, moderate sorted, sub-angular to sub-rounded, trace calcite grains and calcite cement, pale green, grey, orange pink lithic / quartzite / volcanic grains, white feldspar, minor brown mica, poor to occasional fair porosity.

<u>Windermere Member</u> <u>3187-3194m</u>

GR clean	30	API units
GR clay	140	API units
Rt clay	20	ohm-metres
Rw (from Rwa)	0.29	ohm-metres
Rmf	0.68	ohm-metres

3187-3194m	Porosity	9-16%
	Water saturation	50-90%
	Clay content	10-30%

A drill stem test of the interval 3174-3231 metres recovered gas cut water cushion with a trace of oil. Sidewall cores from 3190, 3191 and 3194 metres were lithic sandstones with poor visual porosities and a high clay contents.

The relatively low water saturations calculated from this zone tend to confirm the results of the drill stem test but could also be a result of anomalous log values due to bad hole conditions.

Crayfish Formation 3316-3325m

GR clean	30	API units
GR clay	140	API units
Rt clay	20	ohm-metres
Rw (from Rwa)	0.28	ohm-metres
Rmf	0.66	ohm-metres

3316-3325m	Porosity	5-9%
	Water saturation	30-80%
	Clay content	15-35%

The relatively low water saturations calculated in this zone are probably the result of anomalous log values due to bad hole conditions.

3529-3552m

GR clean	30	API units
GR clay	140	API units
Rt clay	20	ohm-metres
Rw (from Rwa)	0.27	ohm-metres
Rmf	0.64	ohm-metres

3529-3552m	Porosity	4-7%
	Water saturation	60-80%
	Clay content	30-35%

In cuttings this sand is very fine to occasional coarse, poorly sorted, angular to sub-rounded, calcareous clay matrix, lithic, feldspathic with poor to very poor porosity.

CONCLUSIONS

Wireline log analyses confirmed that the sands of the Heathfield Member had fair porosity and a fairly high clay content which destroys permeability. The also indicate high water saturations which agrees with the results of DST #1.

The Lower Eumeralla Formation, the Windermere Member and Crayfish Formation had very poor to poor porosity and moderate to fairly high clay contents. Indicated water saturations are generally high in the sands although there are some relatively low values which are probably the result of anomalous log values due to bad hole conditions.

HEATHFIELD MEMBER

1671 - 1701 metres

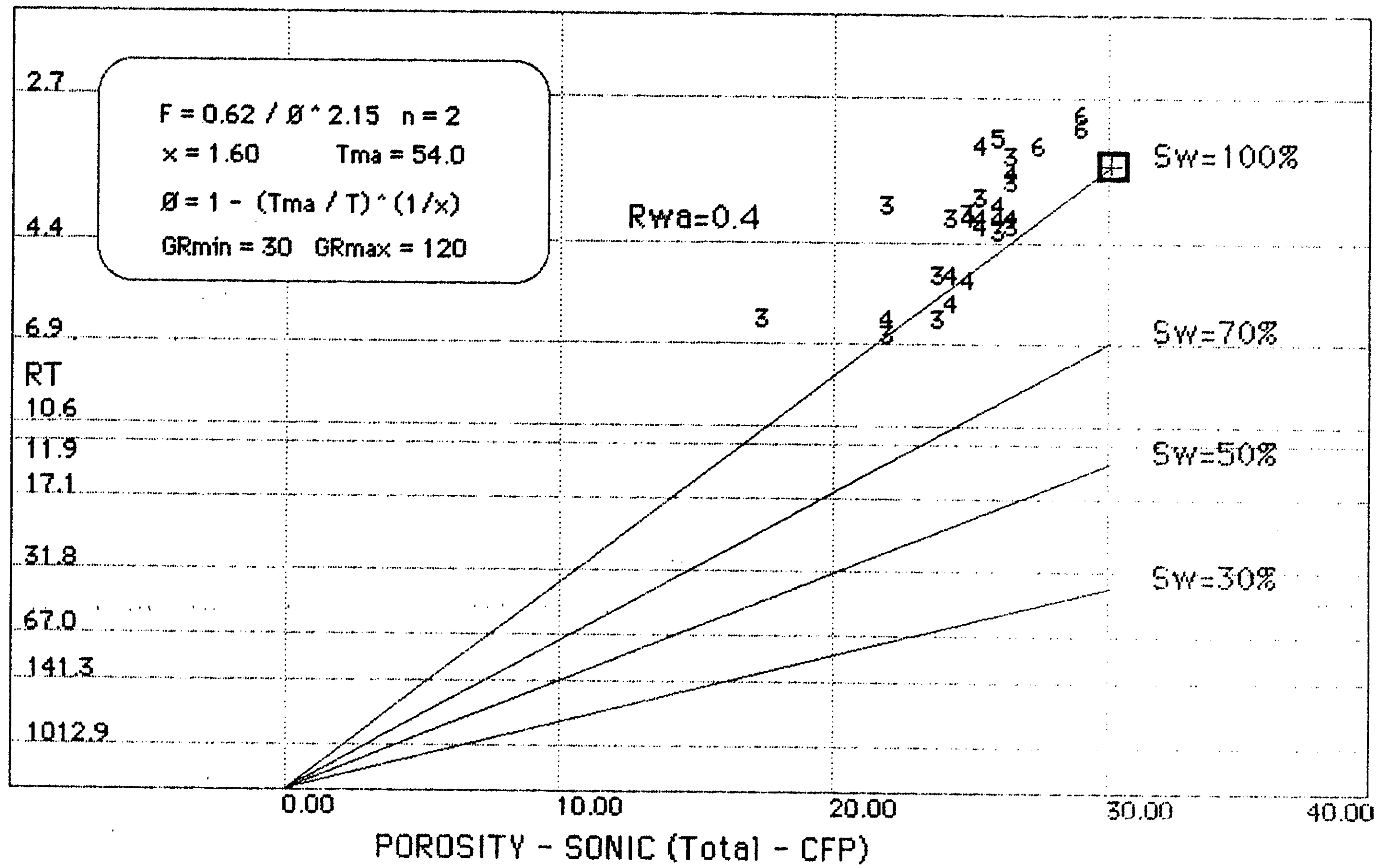
WINDERMERE 2 HEATHFIELD

Mud filtrate density=1.00 g/cc.
Surface temperature=70.00 degrees F. Bottom hole temperature=280.00 degrees F.
Surface depth=0.00 meters. Depth logger=3595.00 meters.

DATA LISTING

Depth meters	MSFL	LLS	LLD	RT	.....	.....	.....	GR	.....	Sonic µsec/ft	Sonic µsec/ft	.....	.....
1671.00	5.00	3.10	3.10	3.10	0.00	0.00	0.00	85.0	0.0	90.000	90.0	0.0	0.00
1672.00	4.70	3.40	3.40	3.40	0.00	0.00	0.00	67.0	0.0	88.000	88.0	0.0	0.00
1673.00	4.20	3.20	3.20	3.20	0.00	0.00	0.00	64.0	0.0	88.000	88.0	0.0	0.00
1674.00	4.10	3.50	3.50	3.50	0.00	0.00	0.00	62.0	0.0	88.000	88.0	0.0	0.00
1675.00	4.60	3.90	3.90	3.90	0.00	0.00	0.00	64.0	0.0	85.000	85.0	0.0	0.00
1676.00	5.00	3.80	3.80	3.80	0.00	0.00	0.00	63.0	0.0	80.000	80.0	0.0	0.00
1677.00	5.00	3.70	3.70	3.70	0.00	0.00	0.00	63.0	0.0	86.000	86.0	0.0	0.00
1678.00	5.90	3.80	3.80	3.80	0.00	0.00	0.00	74.0	0.0	87.000	87.0	0.0	0.00
1679.00	4.00	2.80	2.80	2.80	0.00	0.00	0.00	88.0	0.0	93.000	93.0	0.0	0.00
1680.00	4.00	2.90	2.90	2.90	0.00	0.00	0.00	91.0	0.0	93.000	93.0	0.0	0.00
1681.00	4.00	3.00	3.00	3.00	0.00	0.00	0.00	75.0	0.0	87.000	87.0	0.0	0.00
1682.00	4.00	3.10	3.10	3.10	0.00	0.00	0.00	68.0	0.0	86.000	86.0	0.0	0.00
1683.00	5.00	4.00	4.00	4.00	0.00	0.00	0.00	73.0	0.0	85.000	85.0	0.0	0.00
1684.00	5.50	4.00	4.00	4.00	0.00	0.00	0.00	73.0	0.0	87.000	87.0	0.0	0.00
1685.00	5.00	4.10	4.10	4.10	0.00	0.00	0.00	67.0	0.0	86.000	86.0	0.0	0.00
1686.00	6.00	4.00	4.00	4.00	0.00	0.00	0.00	68.0	0.0	86.000	86.0	0.0	0.00
1687.00	5.50	3.80	3.80	3.80	0.00	0.00	0.00	66.0	0.0	87.000	87.0	0.0	0.00
1688.00	5.10	4.00	4.00	4.00	0.00	0.00	0.00	66.0	0.0	86.000	86.0	0.0	0.00
1689.00	10.00	6.00	6.00	6.00	0.00	0.00	0.00	62.0	0.0	73.000	73.0	0.0	0.00
1690.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	64.0	0.0	83.000	83.0	0.0	0.00
1691.00	5.00	4.00	4.00	4.00	0.00	0.00	0.00	65.0	0.0	84.000	84.0	0.0	0.00
1692.00	5.50	4.20	4.20	4.20	0.00	0.00	0.00	63.0	0.0	87.000	87.0	0.0	0.00
1693.00	5.50	4.00	4.00	4.00	0.00	0.00	0.00	69.0	0.0	88.000	88.0	0.0	0.00
1694.00	5.50	4.00	4.00	4.00	0.00	0.00	0.00	70.0	0.0	88.000	88.0	0.0	0.00
1695.00	5.50	4.10	4.10	4.10	0.00	0.00	0.00	64.0	0.0	88.000	88.0	0.0	0.00
1696.00	6.00	5.10	5.10	5.10	0.00	0.00	0.00	68.0	0.0	85.000	85.0	0.0	0.00
1697.00	6.50	6.50	6.50	6.50	0.00	0.00	0.00	60.0	0.0	80.000	80.0	0.0	0.00
1698.00	8.00	6.00	6.00	6.00	0.00	0.00	0.00	66.0	0.0	80.000	80.0	0.0	0.00
1699.00	7.00	6.00	6.00	6.00	0.00	0.00	0.00	65.0	0.0	83.000	83.0	0.0	0.00
1700.00	5.60	5.60	5.60	5.60	0.00	0.00	0.00	69.0	0.0	84.000	84.0	0.0	0.00
1701.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	71.0	0.0	84.000	84.0	0.0	0.00

WINDERMERE #2 HEATHFIELD MEMBER (1671-1701 m.)



WINDERMERE 2 HEATHFIELD

Vclay is minimum of Vclay from Rt, SP & GR. PHIE=(1-Vclay)*PHIT.
x=1.60 Tma=54.00 microsec/ft CFP-Total model.
GRclean=30.00 GRclay=120.00 SPclean=80.00 SPclay=50.00.
RWA=(RT*PHIT^2.15)/0.62 RMFA=(Rxo*PHIT^2.15)/0.62 Rclay=4.0.

PRE EVALUATION (Sonic porosity)

Depth meters	PHIT	VclayRt	VclaySP	VclayGR	Vclay	PHIE	RWA	RMFA
1671.00	27.3	100.0	100.00	61.1	61.1	10.6	0.307	0.496
1672.00	26.3	100.0	100.00	41.1	41.1	15.5	0.311	0.429
1673.00	26.3	100.0	100.00	37.8	37.8	16.4	0.292	0.384
1674.00	26.3	100.0	100.00	35.6	35.6	17.0	0.320	0.374
1675.00	24.7	100.0	100.00	37.8	37.8	15.4	0.311	0.367
1676.00	21.8	100.0	100.00	36.7	36.7	13.8	0.231	0.304
1677.00	25.2	100.0	100.00	36.7	36.7	16.0	0.309	0.418
1678.00	25.8	100.0	100.00	48.9	48.9	13.2	0.332	0.515
1679.00	28.8	100.0	100.00	64.4	64.4	10.2	0.311	0.444
1680.00	28.8	100.0	100.00	67.8	67.8	9.3	0.322	0.444
1681.00	25.8	100.0	100.00	50.0	50.0	12.9	0.262	0.350
1682.00	25.2	100.0	100.00	42.2	42.2	14.6	0.259	0.334
1683.00	24.7	100.0	100.00	47.8	47.8	12.9	0.319	0.399
1684.00	25.8	100.0	100.00	47.8	47.8	13.5	0.350	0.481
1685.00	25.2	97.6	100.00	41.1	41.1	14.9	0.343	0.418
1686.00	25.2	100.0	100.00	42.2	42.2	14.6	0.334	0.501
1687.00	25.8	100.0	100.00	40.0	40.0	15.5	0.332	0.481
1688.00	25.2	100.0	100.00	40.0	40.0	15.1	0.334	0.426
1689.00	17.2	66.7	100.00	35.6	35.6	11.1	0.219	0.365
1690.00	23.6	80.0	100.00	37.8	37.8	14.7	0.360	0.360
1691.00	24.1	100.0	100.00	38.9	38.9	14.7	0.303	0.379
1692.00	25.8	95.2	100.00	36.7	36.7	16.3	0.367	0.481
1693.00	26.3	100.0	100.00	43.3	43.3	14.9	0.365	0.502
1694.00	26.3	100.0	100.00	44.4	44.4	14.6	0.365	0.502
1695.00	26.3	97.6	100.00	37.8	37.8	16.4	0.374	0.502
1696.00	24.7	78.4	100.00	42.2	42.2	14.3	0.406	0.478
1697.00	21.8	61.5	100.00	33.3	33.3	14.5	0.396	0.396
1698.00	21.8	66.7	100.00	40.0	40.0	13.1	0.365	0.487
1699.00	23.6	66.7	100.00	38.9	38.9	14.4	0.432	0.505
1700.00	24.1	71.4	100.00	43.3	43.3	13.7	0.425	0.425
1701.00	24.1	80.0	100.00	45.6	45.6	13.1	0.379	0.379

WINDERMERE 2 HEATHFIELD (Rw = 0.14 @ 170°F)
Vclay is min. of Vclay from SP, GR & Rt. PHIE=(1-Vclay)*PHIT.
GRclean=30.00 GRclay=120.00 SPclean=80.00 SPclay=50.00 Rtclay=4.000.
Rw=0.140 everywhere except from 0.00 to 0.00 where Rw=0.200.
Rmf=0.090 a=0.62 m=2.15 n=2.00.
PHIE cutoff sets Sw and Sxo to 100% below 0.0 % porosity.
Coal is detected if (RHOB<1.50 and RHOB<>0) or if NPHI>55.0
or if Sonic>140.0 microsec/ft. SPclean=80.00 SPclay=50.00
(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*SwInd^(n/2)
b=1-(Vclay/2)
**** Sonic porosity x=1.60 Tma=54.00 microsec/ft CFP-Total model.

EVALUATION (Sonic porosity)

Depth meters	RHOma	PHIT	Vclay	PHIE	SwInd	SxoInd
1671.00	****	27.3	61.1	10.6	86.0	86.0
1672.00	****	26.3	41.1	15.5	77.0	77.0
1673.00	****	26.3	37.8	16.4	78.5	78.5
1674.00	****	26.3	35.6	17.0	74.5	74.5
1675.00	****	24.7	37.8	15.4	74.5	74.5
1676.00	****	21.8	36.7	13.8	82.2	82.2
1677.00	****	25.2	36.7	16.0	75.0	75.0
1678.00	****	25.8	48.9	13.2	76.0	76.0
1679.00	****	28.8	64.4	10.2	90.0	90.0
1680.00	****	28.8	67.8	9.3	90.3	90.3
1681.00	****	25.8	50.0	12.9	85.9	85.9
1682.00	****	25.2	42.2	14.6	83.3	83.3
1683.00	****	24.7	47.8	12.9	75.7	75.7
1684.00	****	25.8	47.8	13.5	73.7	73.7
1685.00	****	25.2	41.1	14.9	72.2	72.2
1686.00	****	25.2	42.2	14.6	73.4	73.4
1687.00	****	25.8	40.0	15.5	73.6	73.6
1688.00	****	25.2	40.0	15.1	72.8	72.8
1689.00	****	17.2	35.6	11.1	76.7	76.7
1690.00	****	23.6	37.8	14.7	68.0	68.0
1691.00	****	24.1	38.9	14.7	74.9	74.9
1692.00	****	25.8	36.7	16.3	69.3	69.3
1693.00	****	26.3	43.3	14.9	71.6	71.6
1694.00	****	26.3	44.4	14.6	71.9	71.9
1695.00	****	26.3	37.8	16.4	69.4	69.4
1696.00	****	24.7	42.2	14.3	65.9	65.9
1697.00	****	21.8	33.3	14.5	62.6	62.6
1698.00	****	21.8	40.0	13.1	65.7	65.7
1699.00	****	23.6	38.9	14.4	62.2	62.2
1700.00	****	24.1	43.3	13.7	64.1	64.1
1701.00	****	24.1	45.6	13.1	68.2	68.2

WINDERMERE 2 HEATHFIELD

Vclay is min. of Vclay from SP, GR & Rt. PHIE=(1-Vclay)*PHIT.

GRclean=30.00 GRclay=140.00 SPclean=80.00 SPclay=50.00 Rtclay=4.000.

Rw=0.400 everywhere except from 0.00 to 0.00 where Rw=0.200.

Rmf=0.090 a=0.62 m=2.15 n=2.00.

PHIE cutoff sets Sw and Sxo to 100% below 0.0 % porosity.

Coal is detected if (RHOB<1.50 and RHOB<>0) or if NPHI>55.0

or if Sonic>140.0 microsec/ft. SPclean=80.00 SPclay=50.00

(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*Swind^(n/2)

b=1-(Vclay/2)

**** Sonic porosity x=1.60 Tma=54.00 microsec/ft CFP-Total model.

EVALUATION (Sonic porosity)

Depth meters	RHOma	PHIT	Vclay	PHIE	SwInd	SxoInd
1671.00	****	27.3	50.0	13.7	100.0	100.0
1672.00	****	26.3	33.6	17.5	100.0	100.0
1673.00	****	26.3	30.9	18.2	100.0	100.0
1674.00	****	26.3	29.1	18.7	100.0	100.0
1675.00	****	24.7	30.9	17.1	100.0	100.0
1676.00	****	21.8	30.0	15.2	100.0	100.0
1677.00	****	25.2	30.0	17.7	100.0	100.0
1678.00	****	25.8	40.0	15.5	100.0	100.0
1679.00	****	28.8	52.7	13.6	100.0	100.0
1680.00	****	28.8	55.5	12.8	100.0	100.0
1681.00	****	25.8	40.9	15.2	100.0	100.0
1682.00	****	25.2	34.5	16.5	100.0	100.0
1683.00	****	24.7	39.1	15.0	100.0	100.0
1684.00	****	25.8	39.1	15.7	98.2	98.2
1685.00	****	25.2	33.6	16.7	99.5	99.5
1686.00	****	25.2	34.5	16.5	100.0	100.0
1687.00	****	25.8	32.7	17.3	100.0	100.0
1688.00	****	25.2	32.7	17.0	100.0	100.0
1689.00	****	17.2	29.1	12.2	100.0	100.0
1690.00	****	23.6	30.9	16.3	95.0	95.0
1691.00	****	24.1	31.8	16.5	100.0	100.0
1692.00	****	25.8	30.0	18.0	97.9	97.9
1693.00	****	26.3	35.5	17.0	97.7	97.7
1694.00	****	26.3	36.4	16.7	97.6	97.6
1695.00	****	26.3	30.9	18.2	97.5	97.5
1696.00	****	24.7	34.5	16.2	90.3	90.3
1697.00	****	21.8	27.3	15.8	89.2	89.2
1698.00	****	21.8	32.7	14.7	90.5	90.5
1699.00	****	23.6	31.8	16.1	86.5	86.5
1700.00	****	24.1	35.5	15.6	87.1	87.1
1701.00	****	24.1	37.3	15.1	91.7	91.7

<u>HEATHFIELD MEMBER</u>

1720 - 1748 metres

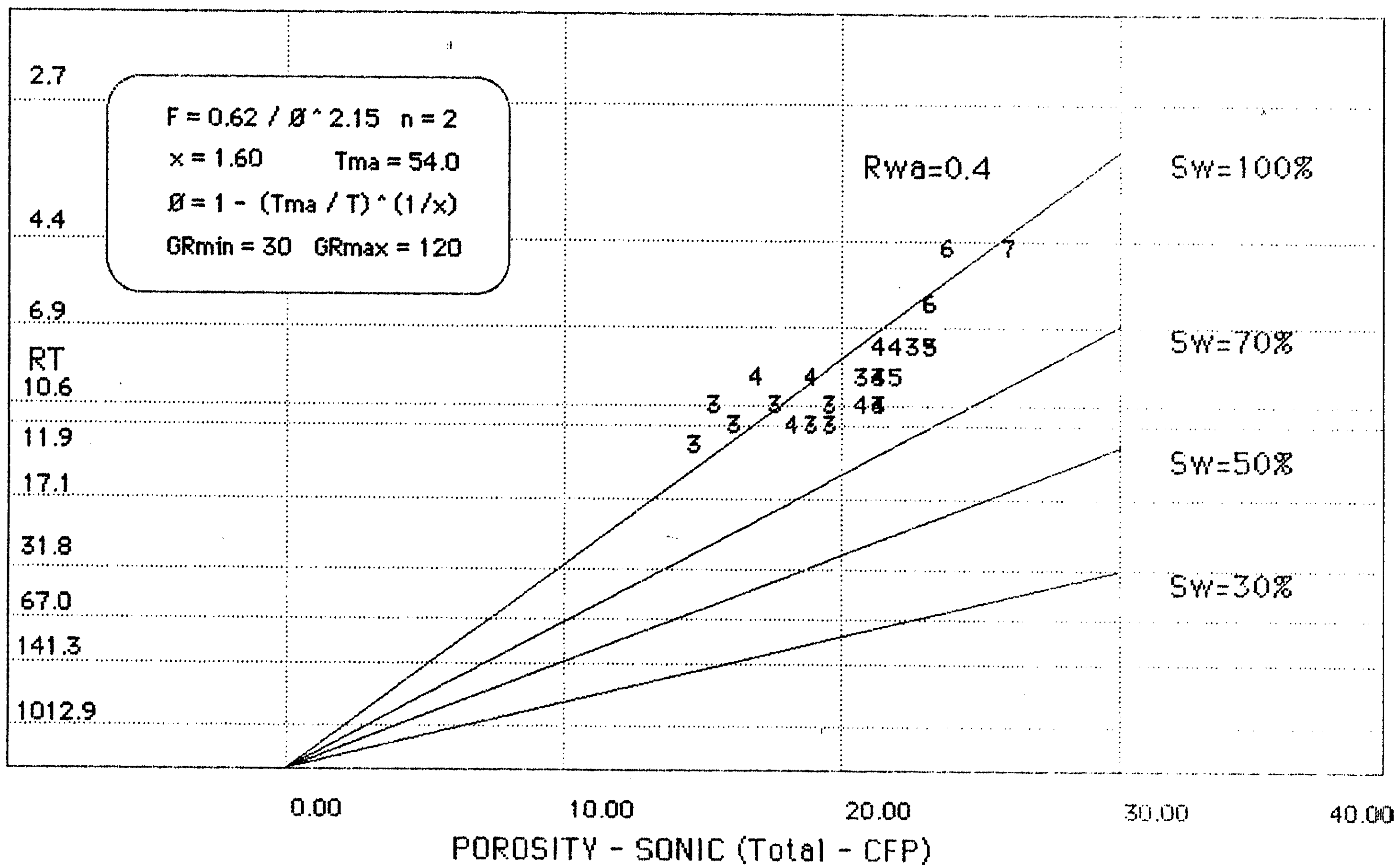
WINDERMERE 2 HEATHFIELD

Mud filtrate density=1.00 g/cc.
Surface temperature=70.00 degrees F. Bottom hole temperature=280.00 degrees F.
Surface depth=0.00 meters. Depth logger=3595.00 meters.

DATA LISTING

Depth . meters	MSFL	LLS	LLD	RT	....		......	GR	......	Sonic µsec/ft	Sonic µsec/ft	....	
1720.00	4.00	4.00	4.00	4.00	0.00	0.00	0.00	90.0	0.0	85.000	85.0	0.0	0.00
1721.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	89.0	0.0	84.000	84.0	0.0	0.00
1722.00	4.00	4.00	4.00	4.00	0.00	0.00	0.00	96.0	0.0	89.000	89.0	0.0	0.00
1723.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	80.0	0.0	82.000	82.0	0.0	0.00
1724.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	74.0	0.0	81.000	81.0	0.0	0.00
1725.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	72.0	0.0	81.000	81.0	0.0	0.00
1726.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	74.0	0.0	82.000	82.0	0.0	0.00
1727.00	8.00	8.00	8.00	8.00	0.00	0.00	0.00	65.0	0.0	81.000	81.0	0.0	0.00
1728.00	8.00	8.00	8.00	8.00	0.00	0.00	0.00	72.0	0.0	81.000	81.0	0.0	0.00
1729.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	66.0	0.0	77.000	77.0	0.0	0.00
1730.00	8.00	8.00	8.00	8.00	0.00	0.00	0.00	66.0	0.0	81.000	81.0	0.0	0.00
1731.00	8.00	8.00	8.00	8.00	0.00	0.00	0.00	60.0	0.0	75.000	75.0	0.0	0.00
1732.00	8.00	8.00	8.00	8.00	0.00	0.00	0.00	60.0	0.0	72.000	72.0	0.0	0.00
1733.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	60.0	0.0	80.000	80.0	0.0	0.00
1734.00	8.00	8.00	8.00	8.00	0.00	0.00	0.00	62.0	0.0	81.000	81.0	0.0	0.00
1735.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	60.0	0.0	71.000	71.0	0.0	0.00
1736.00	9.00	9.00	9.00	9.00	0.00	0.00	0.00	62.0	0.0	78.000	78.0	0.0	0.00
1737.00	9.00	9.00	9.00	9.00	0.00	0.00	0.00	63.0	0.0	77.000	77.0	0.0	0.00
1738.00	8.00	8.00	8.00	8.00	0.00	0.00	0.00	68.0	0.0	80.000	80.0	0.0	0.00
1739.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	62.0	0.0	81.000	81.0	0.0	0.00
1740.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	60.0	0.0	84.000	84.0	0.0	0.00
1741.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	63.0	0.0	83.000	83.0	0.0	0.00
1742.00	9.00	9.00	9.00	9.00	0.00	0.00	0.00	65.0	0.0	73.000	73.0	0.0	0.00
1743.00	9.00	9.00	9.00	9.00	0.00	0.00	0.00	69.0	0.0	76.000	76.0	0.0	0.00
1744.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	68.0	0.0	74.000	74.0	0.0	0.00
1745.00	8.00	8.00	8.00	8.00	0.00	0.00	0.00	59.0	0.0	78.000	78.0	0.0	0.00
1746.00	9.00	9.00	9.00	9.00	0.00	0.00	0.00	65.0	0.0	77.000	77.0	0.0	0.00
1747.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	65.0	0.0	84.000	84.0	0.0	0.00
1748.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	83.0	0.0	84.000	84.0	0.0	0.00

WINDERMERE #2 HEATHFIELD MEMBER (1720-1748 m.)



WINDERMERE 2 HEATHFIELD

Vclay is minimum of Vclay from Rt, SP & GR. PHIE=(1-Vclay)*PHIT.
x=1.60 Tma=54.00 microsec/ft CFP-Total model.
GRclean=30.00 GRclay=120.00 SPclean=80.00 SPclay=50.00.
RWA=(RT*PHIT^2.15)/0.62 RMFA=(Rxo*PHIT^2.15)/0.62 Rclay=4.0.

PRE EVALUATION (Sonic porosity)

Depth meters	PHIT	VclayRt	VclaySP	VclayGR	Vclay	PHIE	RWA	RMFA
1720.00	24.7	100.0	100.00	66.7	66.7	8.2	0.319	0.319
1721.00	24.1	80.0	100.00	65.6	65.6	8.3	0.379	0.379
1722.00	26.8	100.0	100.00	73.3	73.3	7.2	0.381	0.381
1723.00	23.0	57.1	100.00	55.6	55.6	10.2	0.478	0.478
1724.00	22.4	57.1	100.00	48.9	48.9	11.4	0.452	0.452
1725.00	22.4	66.7	100.00	46.7	46.7	11.9	0.387	0.387
1726.00	23.0	66.7	100.00	48.9	48.9	11.7	0.410	0.410
1727.00	22.4	50.0	100.00	38.9	38.9	13.7	0.517	0.517
1728.00	22.4	50.0	100.00	46.7	46.7	11.9	0.517	0.517
1729.00	19.9	57.1	100.00	40.0	40.0	11.9	0.351	0.351
1730.00	22.4	50.0	100.00	40.0	40.0	13.4	0.517	0.517
1731.00	18.6	50.0	100.00	33.3	33.3	12.4	0.345	0.345
1732.00	16.5	50.0	100.00	33.3	33.3	11.0	0.267	0.267
1733.00	21.8	57.1	100.00	33.3	33.3	14.5	0.426	0.426
1734.00	22.4	50.0	100.00	35.6	35.6	14.4	0.517	0.517
1735.00	15.7	40.0	100.00	33.3	33.3	10.5	0.302	0.302
1736.00	20.5	44.4	100.00	35.6	35.6	13.2	0.483	0.483
1737.00	19.9	44.4	100.00	36.7	36.7	12.6	0.451	0.451
1738.00	21.8	50.0	100.00	42.2	42.2	12.6	0.487	0.487
1739.00	22.4	57.1	100.00	35.6	35.6	14.4	0.452	0.452
1740.00	24.1	66.7	100.00	33.3	33.3	16.1	0.455	0.455
1741.00	23.6	66.7	100.00	36.7	36.7	14.9	0.432	0.432
1742.00	17.2	44.4	100.00	38.9	38.9	10.5	0.329	0.329
1743.00	19.2	44.4	100.00	43.3	43.3	10.9	0.419	0.419
1744.00	17.9	57.1	100.00	42.2	42.2	10.3	0.279	0.279
1745.00	20.5	50.0	100.00	32.2	32.2	13.9	0.429	0.429
1746.00	19.9	44.4	100.00	38.9	38.9	12.2	0.451	0.451
1747.00	24.1	66.7	100.00	38.9	38.9	14.7	0.455	0.455
1748.00	24.1	66.7	100.00	58.9	58.9	9.9	0.455	0.455

WINDERMERE 2 HEATHFIELD

Vclay is min. of Vclay from SP, GR & Rt. PHIE=(1-Vclay)*PHIT

GRclean=30.00 GRclay=120.00 SPclean=80.00 SPclay=50.00 Rtclay=4.000.

Rw=0.400 everywhere except from 0.00 to 0.00 where Rw=0.200.

Rmf=0.090 a=0.62 m=2.15 n=2.00.

PHIE cutoff sets Sw and Sxo to 100% below 0.0 % porosity.

Coal is detected if (RHOB<2.00 and RHOB<>0) or if NPHI>55.0

or if Sonic>100.0 microsec/ft. SPclean=80.00 SPclay=50.00

(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*SwInd^(n/2)

b=1-(Vclay/2)

**** Sonic porosity x=1.60 Tma=54.00 microsec/ft CFP-Total model.

EVALUATION (Sonic porosity)

Depth meters	RHOma	PHIT	Vclay	PHIE	SwInd	SxoInd
1720.00	****	24.7	66.7	8.2	96.4	96.4
1721.00	****	24.1	65.6	8.3	86.8	86.8
1722.00	****	26.8	73.3	7.2	94.6	94.6
1723.00	****	23.0	55.6	10.2	75.6	75.6
1724.00	****	22.4	48.9	11.4	77.7	77.7
1725.00	****	22.4	46.7	11.9	84.5	84.5
1726.00	****	23.0	48.9	11.7	83.0	83.0
1727.00	****	22.4	38.9	13.7	75.2	75.2
1728.00	****	22.4	46.7	11.9	73.2	73.2
1729.00	****	19.9	40.0	11.9	85.0	85.0
1730.00	****	22.4	40.0	13.4	74.9	74.9
1731.00	****	18.6	33.3	12.4	85.7	85.7
1732.00	****	16.5	33.3	11.0	91.4	91.4
1733.00	****	21.8	33.3	14.5	83.5	83.5
1734.00	****	22.4	35.6	14.4	76.2	76.2
1735.00	****	15.7	33.3	10.5	83.7	83.7
1736.00	****	20.5	35.6	13.2	75.4	75.4
1737.00	****	19.9	36.7	12.6	76.3	76.3
1738.00	****	21.8	42.2	12.6	75.3	75.3
1739.00	****	22.4	35.6	14.4	81.4	81.4
1740.00	****	24.1	33.3	16.1	84.7	84.7
1741.00	****	23.6	36.7	14.9	85.0	85.0
1742.00	****	17.2	38.9	10.5	81.0	81.0
1743.00	****	19.2	43.3	10.9	74.9	74.9
1744.00	****	17.9	42.2	10.3	88.3	88.3
1745.00	****	20.5	32.2	13.9	81.4	81.4
1746.00	****	19.9	38.9	12.2	75.4	75.4
1747.00	****	24.1	38.9	14.7	83.3	83.3
1748.00	****	24.1	58.9	9.9	79.8	79.8

WINDERMERE 2 HEATHFIELD (Rw = 0.14 @ 170°F)
Vclay is min. of Vclay from SP, GR & Rt. PHIE=(1-Vclay)*PHIT.
GRclean=30.00 GRclay=120.00 SPclean=80.00 SPclay=50.00 Rtclay=4.000.
Rw=0.140 everywhere except from 0.00 to 0.00 where Rw=0.200.
Rmf=0.090 a=0.62 m=2.15 n=2.00.
PHIE cutoff sets Sw and Sxo to 100% below 0.0 % porosity.
Coal is detected if (RHOB<1.50 and RHOB<>0) or if NPHI>55.0
or if Sonic>140.0 microsec/ft. SPclean=80.00 SPclay=50.00
(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*Swind^(n/2)
b=1-(Vclay/2)
**** Sonic porosity x=1.60 Tma=54.00 microsec/ft CFP-Total model.

EVALUATION (Sonic porosity)

Depth meters	RHOma	PHIT	Vclay	PHIE	Swind	Sxoind
1720.00	****	24.7	66.7	8.2	81.5	81.5
1721.00	****	24.1	65.6	8.3	73.3	73.3
1722.00	****	26.8	73.3	7.2	82.0	82.0
1723.00	****	23.0	55.6	10.2	61.0	61.0
1724.00	****	22.4	48.9	11.4	60.8	60.8
1725.00	****	22.4	46.7	11.9	65.4	65.4
1726.00	****	23.0	48.9	11.7	64.7	64.7
1727.00	****	22.4	38.9	13.7	55.8	55.8
1728.00	****	22.4	46.7	11.9	56.6	56.6
1729.00	****	19.9	40.0	11.9	64.5	64.5
1730.00	****	22.4	40.0	13.4	55.9	55.9
1731.00	****	18.6	33.3	12.4	63.2	63.2
1732.00	****	16.5	33.3	11.0	68.6	68.6
1733.00	****	21.8	33.3	14.5	60.3	60.3
1734.00	****	22.4	35.6	14.4	55.5	55.5
1735.00	****	15.7	33.3	10.5	63.2	63.2
1736.00	****	20.5	35.6	13.2	55.6	55.6
1737.00	****	19.9	36.7	12.6	56.8	56.8
1738.00	****	21.8	42.2	12.6	57.1	57.1
1739.00	****	22.4	35.6	14.4	59.3	59.3
1740.00	****	24.1	33.3	16.1	60.4	60.4
1741.00	****	23.6	36.7	14.9	61.9	61.9
1742.00	****	17.2	38.9	10.5	62.4	62.4
1743.00	****	19.2	43.3	10.9	58.2	58.2
1744.00	****	17.9	42.2	10.3	68.9	68.9
1745.00	****	20.5	32.2	13.9	58.8	58.8
1746.00	****	19.9	38.9	12.2	56.9	56.9
1747.00	****	24.1	38.9	14.7	61.2	61.2
1748.00	****	24.1	58.9	9.9	65.1	65.1

HEATHFIELD MEMBER

1760 - 1806 metres

WINDERMERE 2   HEATHFIELD

Mud filtrate density=1.00 g/cc.
Surface temperature=70.00 degrees F.   Bottom hole temperature=280.00 degrees F.
Surface depth=0.00 meters.   Depth logger=3595.00 meters.

DATA LISTING

Depth meters	MSFL	LLS	LLD	RT	....	....	....	GR	....	Sonic µsec/ft	Sonic µsec/ft	....	....
1760.00	4.00	4.00	4.00	4.00	0.00	0.00	0.00	105.0	0.0	93.000	93.0	0.0	0.00
1761.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	90.0	0.0	84.000	84.0	0.0	0.00
1762.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	75.0	0.0	80.000	80.0	0.0	0.00
1763.00	8.00	8.00	8.00	8.00	0.00	0.00	0.00	75.0	0.0	80.000	80.0	0.0	0.00
1764.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	75.0	0.0	75.000	75.0	0.0	0.00
1765.00	8.00	8.00	8.00	8.00	0.00	0.00	0.00	75.0	0.0	78.000	78.0	0.0	0.00
1766.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	75.0	0.0	84.000	84.0	0.0	0.00
1767.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	75.0	0.0	81.000	81.0	0.0	0.00
1768.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	75.0	0.0	84.000	84.0	0.0	0.00
1769.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	75.0	0.0	80.000	80.0	0.0	0.00
1770.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	77.0	0.0	84.000	84.0	0.0	0.00
1771.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	74.0	0.0	76.000	76.0	0.0	0.00
1772.00	9.00	9.00	9.00	9.00	0.00	0.00	0.00	74.0	0.0	78.000	78.0	0.0	0.00
1773.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	75.0	0.0	80.000	80.0	0.0	0.00
1774.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	65.0	0.0	73.000	73.0	0.0	0.00
1775.00	8.00	8.00	8.00	8.00	0.00	0.00	0.00	65.0	0.0	73.000	73.0	0.0	0.00
1776.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	75.0	0.0	80.000	80.0	0.0	0.00
1777.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	71.0	0.0	81.000	81.0	0.0	0.00
1778.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	74.0	0.0	80.000	80.0	0.0	0.00
1779.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	66.0	0.0	67.000	67.0	0.0	0.00
1780.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	75.0	0.0	85.000	85.0	0.0	0.00
1781.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	77.0	0.0	85.000	85.0	0.0	0.00
1782.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	75.0	0.0	84.000	84.0	0.0	0.00

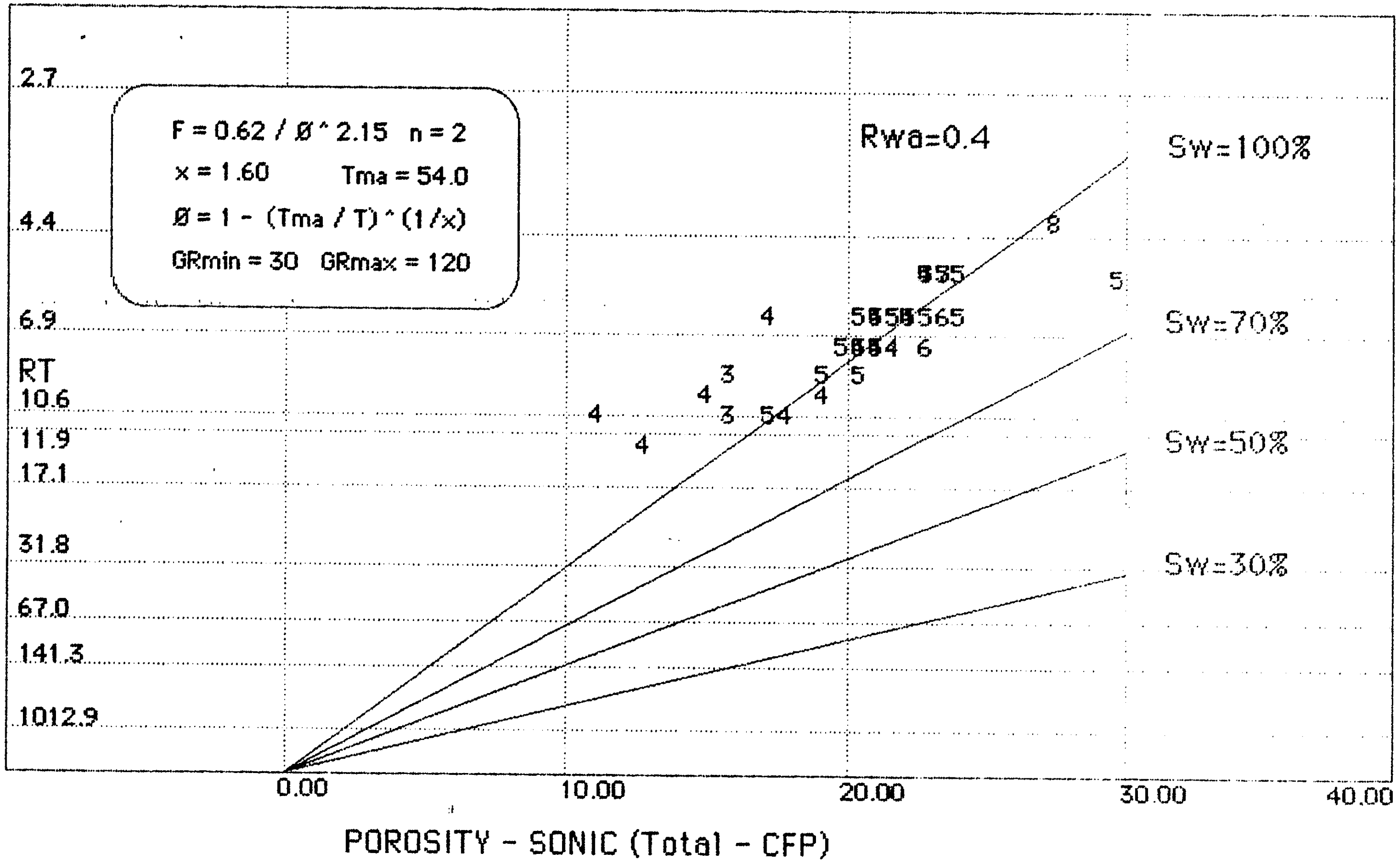
WINDERMERE 2   HEATHFIELD

Mud filtrate density=1.00 g/cc.
Surface temperature=70.00 degrees F.   Bottom hole temperature=280.00 degrees F.
Surface depth=0.00 meters.   Depth logger=3595.00 meters.

DATA LISTING

Depth	MSFL	LLS	LLD	RT	....	....	......	GR	......	Sonic	Sonic	......	......
meters										µsec/ft	µsec/ft		
1783.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	78.0	0.0	83.000	83.0	0.0	0.00
1784.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	83.0	0.0	82.000	82.0	0.0	0.00
1785.00	8.00	8.00	8.00	8.00	0.00	0.00	0.00	75.0	0.0	80.000	80.0	0.0	0.00
1786.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	77.0	0.0	79.000	79.0	0.0	0.00
1787.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	80.0	0.0	86.000	86.0	0.0	0.00
1788.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	75.0	0.0	84.000	84.0	0.0	0.00
1789.00	7.00	7.00	7.00	7.00	0.00	0.00	0.00	74.0	0.0	82.000	82.0	0.0	0.00
1790.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	74.0	0.0	81.000	81.0	0.0	0.00
1791.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	74.0	0.0	83.000	83.0	0.0	0.00
1792.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	74.0	0.0	84.000	84.0	0.0	0.00
1793.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	78.0	0.0	86.000	86.0	0.0	0.00
1794.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	80.0	0.0	85.000	85.0	0.0	0.00
1795.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	98.0	0.0	84.000	84.0	0.0	0.00
1796.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	93.0	0.0	85.000	85.0	0.0	0.00
1797.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	75.0	0.0	84.000	84.0	0.0	0.00
1798.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	77.0	0.0	85.000	85.0	0.0	0.00
1799.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	77.0	0.0	98.000	98.0	0.0	0.00
1800.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	75.0	0.0	83.000	83.0	0.0	0.00
1801.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	74.0	0.0	75.000	75.0	0.0	0.00
1802.00	5.00	5.00	5.00	5.00	0.00	0.00	0.00	80.0	0.0	86.000	86.0	0.0	0.00
1803.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	84.0	0.0	85.000	85.0	0.0	0.00
1804.00	9.00	9.00	9.00	9.00	0.00	0.00	0.00	71.0	0.0	72.000	72.0	0.0	0.00
1805.00	12.00	12.00	12.00	12.00	0.00	0.00	0.00	66.0	0.0	69.000	69.0	0.0	0.00
1806.00	6.00	6.00	6.00	6.00	0.00	0.00	0.00	75.0	0.0	81.000	81.0	0.0	0.00

WINDERMERE #2 HEATHFIELD MEMBER (1760-1806 m.)



WINDERMERE 2 HEATHFIELD

Vclay is minimum of Vclay from Rt, SP & GR. PHIE=(1-Vclay)*PHIT.
x=1.60 Tma=54.00 microsec/ft CFP-Total model.
GRclean=30.00 GRclay=120.00 SPclean=80.00 SPclay=50.00.
RWA=(RT*PHIT^2.15)/0.62 RMFA=(Rxo*PHIT^2.15)/0.62 Rclay=4.0.

PRE EVALUATION (Sonic porosity)

Depth meters	PHIT	VclayRt	VclaySP	VclayGR	Vclay	PHIE	RWA	RMFA
1760.00	28.8	100.0	100.00	83.3	83.3	4.8	0.444	0.444
1761.00	24.1	57.1	100.00	66.7	57.1	10.3	0.531	0.531
1762.00	21.8	57.1	100.00	50.0	50.0	10.9	0.426	0.426
1763.00	21.8	50.0	100.00	50.0	50.0	10.9	0.487	0.487
1764.00	18.6	40.0	100.00	50.0	40.0	11.1	0.432	0.432
1765.00	20.5	50.0	100.00	50.0	50.0	10.3	0.429	0.429
1766.00	24.1	66.7	100.00	50.0	50.0	12.1	0.455	0.455
1767.00	22.4	57.1	100.00	50.0	50.0	11.2	0.452	0.452
1768.00	24.1	66.7	100.00	50.0	50.0	12.1	0.455	0.455
1769.00	21.8	57.1	100.00	50.0	50.0	10.9	0.426	0.426
1770.00	24.1	80.0	100.00	52.2	52.2	11.5	0.379	0.379
1771.00	19.2	40.0	100.00	48.9	40.0	11.5	0.466	0.466
1772.00	20.5	44.4	100.00	48.9	44.4	11.4	0.483	0.483
1773.00	21.8	57.1	100.00	50.0	50.0	10.9	0.426	0.426
1774.00	17.2	40.0	100.00	38.9	38.9	10.5	0.365	0.365
1775.00	17.2	50.0	100.00	38.9	38.9	10.5	0.292	0.292
1776.00	21.8	66.7	100.00	50.0	50.0	10.9	0.365	0.365
1777.00	22.4	57.1	100.00	45.6	45.6	12.2	0.452	0.452
1778.00	21.8	57.1	100.00	48.9	48.9	11.1	0.426	0.426
1779.00	12.6	40.0	100.00	40.0	40.0	7.6	0.188	0.188
1780.00	24.7	80.0	100.00	50.0	50.0	12.3	0.399	0.399
1781.00	24.7	80.0	100.00	52.2	52.2	11.8	0.399	0.399
1782.00	24.1	80.0	100.00	50.0	50.0	12.1	0.379	0.379
1783.00	23.6	66.7	100.00	53.3	53.3	11.0	0.432	0.432
1784.00	23.0	66.7	100.00	58.9	58.9	9.4	0.410	0.410
1785.00	21.8	50.0	100.00	50.0	50.0	10.9	0.487	0.487
1786.00	21.2	57.1	100.00	52.2	52.2	10.1	0.401	0.401
1787.00	25.2	66.7	100.00	55.6	55.6	11.2	0.501	0.501
1788.00	24.1	66.7	100.00	50.0	50.0	12.1	0.455	0.455
1789.00	23.0	57.1	100.00	48.9	48.9	11.7	0.478	0.478
1790.00	22.4	66.7	100.00	48.9	48.9	11.4	0.387	0.387
1791.00	23.6	66.7	100.00	48.9	48.9	12.0	0.432	0.432
1792.00	24.1	80.0	100.00	48.9	48.9	12.3	0.379	0.379
1793.00	25.2	80.0	100.00	53.3	53.3	11.8	0.418	0.418
1794.00	24.7	80.0	100.00	55.6	55.6	11.0	0.399	0.399
1795.00	24.1	80.0	100.00	75.6	75.6	5.9	0.379	0.379
1796.00	24.7	80.0	100.00	70.0	70.0	7.4	0.399	0.399
1797.00	24.1	80.0	100.00	50.0	50.0	12.1	0.379	0.379
1798.00	24.7	80.0	100.00	52.2	52.2	11.8	0.399	0.399
1799.00	31.1	80.0	100.00	52.2	52.2	14.9	0.655	0.655
1800.00	23.6	66.7	100.00	50.0	50.0	11.8	0.432	0.432
1801.00	18.6	66.7	100.00	48.9	48.9	9.5	0.259	0.259
1802.00	25.2	80.0	100.00	55.6	55.6	11.2	0.418	0.418
1803.00	24.7	66.7	100.00	60.0	60.0	9.9	0.478	0.478
1804.00	16.5	44.4	100.00	45.6	44.4	9.1	0.300	0.300
1805.00	14.2	33.7	100.00	40.0	33.7	9.4	0.291	0.291
1806.00	22.4	66.7	100.00	50.0	50.0	11.2	0.387	0.387

WINDERMERE 2 HEATHFIELD

Vclay is min. of Vclay from SP, GR & Rt. PHIE=(1-Vclay)*PHIT.
GRclean=30.00 GRclay=120.00 SPclean=80.00 SPclay=50.00 Rtclay=4.000.
Rw=0.400 everywhere except from 0.00 to 0.00 where Rw=0.200.
Rmf=0.090 a=0.62 m=2.15 n=2.00.
PHIE cutoff sets Sw and Sxo to 100% below 0.0 % porosity.
Coal is detected if (RHOB<2.00 and RHOB<>0) or if NPHI>55.0
or if Sonic>100.0 microsec/ft. SPclean=80.00 SPclay=50.00
(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*SwInd^(n/2)
b=1-(Vclay/2)
**** Sonic porosity x=1.60 Tma=54.00 microsec/ft CFP-Total model.

EVALUATION (Sonic porosity)

Depth meters	RHOma	PHIT	Vclay	PHIE	SwInd	SxoInd
1760.00	****	28.8	83.3	4.8	95.0	95.0
1761.00	****	24.1	57.1	10.3	74.1	74.1
1762.00	****	21.8	50.0	10.9	78.3	78.3
1763.00	****	21.8	50.0	10.9	73.3	73.3
1764.00	****	18.6	40.0	11.1	73.6	73.6
1765.00	****	20.5	50.0	10.3	75.0	75.0
1766.00	****	24.1	50.0	12.1	81.0	81.0
1767.00	****	22.4	50.0	11.2	77.4	77.4
1768.00	****	24.1	50.0	12.1	81.0	81.0
1769.00	****	21.8	50.0	10.9	78.3	78.3
1770.00	****	24.1	52.2	11.5	88.3	88.3
1771.00	****	19.2	40.0	11.5	72.3	72.3
1772.00	****	20.5	44.4	11.4	72.3	72.3
1773.00	****	21.8	50.0	10.9	78.3	78.3
1774.00	****	17.2	38.9	10.5	76.8	76.8
1775.00	****	17.2	38.9	10.5	85.9	85.9
1776.00	****	21.8	50.0	10.9	84.6	84.6
1777.00	****	22.4	45.6	12.2	78.5	78.5
1778.00	****	21.8	48.9	11.1	78.6	78.6
1779.00	****	12.6	40.0	7.6	86.5	86.5
1780.00	****	24.7	50.0	12.3	87.8	87.8
1781.00	****	24.7	52.2	11.8	87.5	87.5
1782.00	****	24.1	50.0	12.1	88.7	88.7
1783.00	****	23.6	53.3	11.0	81.3	81.3
1784.00	****	23.0	58.9	9.4	81.2	81.2
1785.00	****	21.8	50.0	10.9	73.3	73.3
1786.00	****	21.2	52.2	10.1	78.7	78.7
1787.00	****	25.2	55.6	11.2	78.8	78.8
1788.00	****	24.1	50.0	12.1	81.0	81.0
1789.00	****	23.0	48.9	11.7	76.8	76.8
1790.00	****	22.4	48.9	11.4	83.9	83.9
1791.00	****	23.6	48.9	12.0	82.1	82.1
1792.00	****	24.1	48.9	12.3	88.9	88.9
1793.00	****	25.2	53.3	11.8	86.5	86.5
1794.00	****	24.7	55.6	11.0	87.1	87.1
1795.00	****	24.1	75.6	5.9	86.7	86.7
1796.00	****	24.7	70.0	7.4	86.2	86.2
1797.00	****	24.1	50.0	12.1	88.7	88.7
1798.00	****	24.7	52.2	11.8	87.5	87.5
1799.00	****	31.1	52.2	14.9	78.7	78.7
1800.00	****	23.6	50.0	11.8	81.8	81.8
1801.00	****	18.6	48.9	9.5	90.6	90.6
1802.00	****	25.2	55.6	11.2	86.3	86.3
1803.00	****	24.7	60.0	9.9	79.1	79.1
1804.00	****	16.5	44.4	9.1	79.5	79.5
1805.00	****	14.2	33.7	9.4	80.0	80.0
1806.00	****	22.4	50.0	11.2	83.7	83.7

WINDERMERE 2 HEATHFIELD (Rw = 0.14 @ 170°F)
Vclay is min. of Vclay from SP, GR & Rt. PHIE=(1-Vclay)*PHIT.
GRclean=30.00 GRclay=120.00 SPclean=80.00 SPclay=50.00 Rtclay=4.000.
Rw=0.140 everywhere except from 0.00 to 0.00 where Rw=0.200.
Rmf=0.090 a=0.62 m=2.15 n=2.00.
PHIE cutoff sets Sw and Sxo to 100% below 0.0 % porosity.
Coal is detected if (RHOB<1.50 and RHOB<>0) or if NPHI>55.0
or if Sonic>140.0 microsec/ft. SPclean=80.00 SPclay=50.00
(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*Swind^(n/2)
b=1-(Vclay/2)
**** Sonic porosity x=1.60 Tma=54.00 microsec/ft CFP-Total model.

EVALUATION (Sonic porosity)

Depth meters	RHOma	PHIT	Vclay	PHIE	Swind	Sxoind
1760.00	****	28.8	83.3	4.8	86.3	86.3
1761.00	****	24.1	57.1	10.3	59.9	59.9
1762.00	****	21.8	50.0	10.9	61.9	61.9
1763.00	****	21.8	50.0	10.9	57.9	57.9
1764.00	****	18.6	40.0	11.1	56.4	56.4
1765.00	****	20.5	50.0	10.3	59.8	59.8
1766.00	****	24.1	50.0	12.1	63.1	63.1
1767.00	****	22.4	50.0	11.2	61.0	61.0
1768.00	****	24.1	50.0	12.1	63.1	63.1
1769.00	****	21.8	50.0	10.9	61.9	61.9
1770.00	****	24.1	52.2	11.5	69.6	69.6
1771.00	****	19.2	40.0	11.5	55.2	55.2
1772.00	****	20.5	44.4	11.4	56.0	56.0
1773.00	****	21.8	50.0	10.9	61.9	61.9
1774.00	****	17.2	38.9	10.5	59.2	59.2
1775.00	****	17.2	38.9	10.5	66.2	66.2
1776.00	****	21.8	50.0	10.9	66.9	66.9
1777.00	****	22.4	45.6	12.2	60.4	60.4
1778.00	****	21.8	48.9	11.1	61.8	61.8
1779.00	****	12.6	40.0	7.6	70.0	70.0
1780.00	****	24.7	50.0	12.3	68.2	68.2
1781.00	****	24.7	52.2	11.8	68.8	68.8
1782.00	****	24.1	50.0	12.1	69.1	69.1
1783.00	****	23.6	53.3	11.0	64.6	64.6
1784.00	****	23.0	58.9	9.4	66.6	66.6
1785.00	****	21.8	50.0	10.9	57.9	57.9
1786.00	****	21.2	52.2	10.1	63.2	63.2
1787.00	****	25.2	55.6	11.2	62.8	62.8
1788.00	****	24.1	50.0	12.1	63.1	63.1
1789.00	****	23.0	48.9	11.7	59.9	59.9
1790.00	****	22.4	48.9	11.4	65.7	65.7
1791.00	****	23.6	48.9	12.0	63.8	63.8
1792.00	****	24.1	48.9	12.3	68.9	68.9
1793.00	****	25.2	53.3	11.8	68.2	68.2
1794.00	****	24.7	55.6	11.0	69.6	69.6
1795.00	****	24.1	75.6	5.9	76.9	76.9
1796.00	****	24.7	70.0	7.4	74.1	74.1
1797.00	****	24.1	50.0	12.1	69.1	69.1
1798.00	****	24.7	52.2	11.8	68.8	68.8
1799.00	****	31.1	52.2	14.9	59.9	59.9
1800.00	****	23.6	50.0	11.8	64.0	64.0
1801.00	****	18.6	48.9	9.5	72.8	72.8
1802.00	****	25.2	55.6	11.2	68.8	68.8
1803.00	****	24.7	60.0	9.9	64.7	64.7
1804.00	****	16.5	44.4	9.1	63.4	63.4
1805.00	****	14.2	33.7	9.4	61.4	61.4
1806.00	****	22.4	50.0	11.2	65.9	65.9

LOWER EUMERALLA FORMATION

2529 - 2547 metres

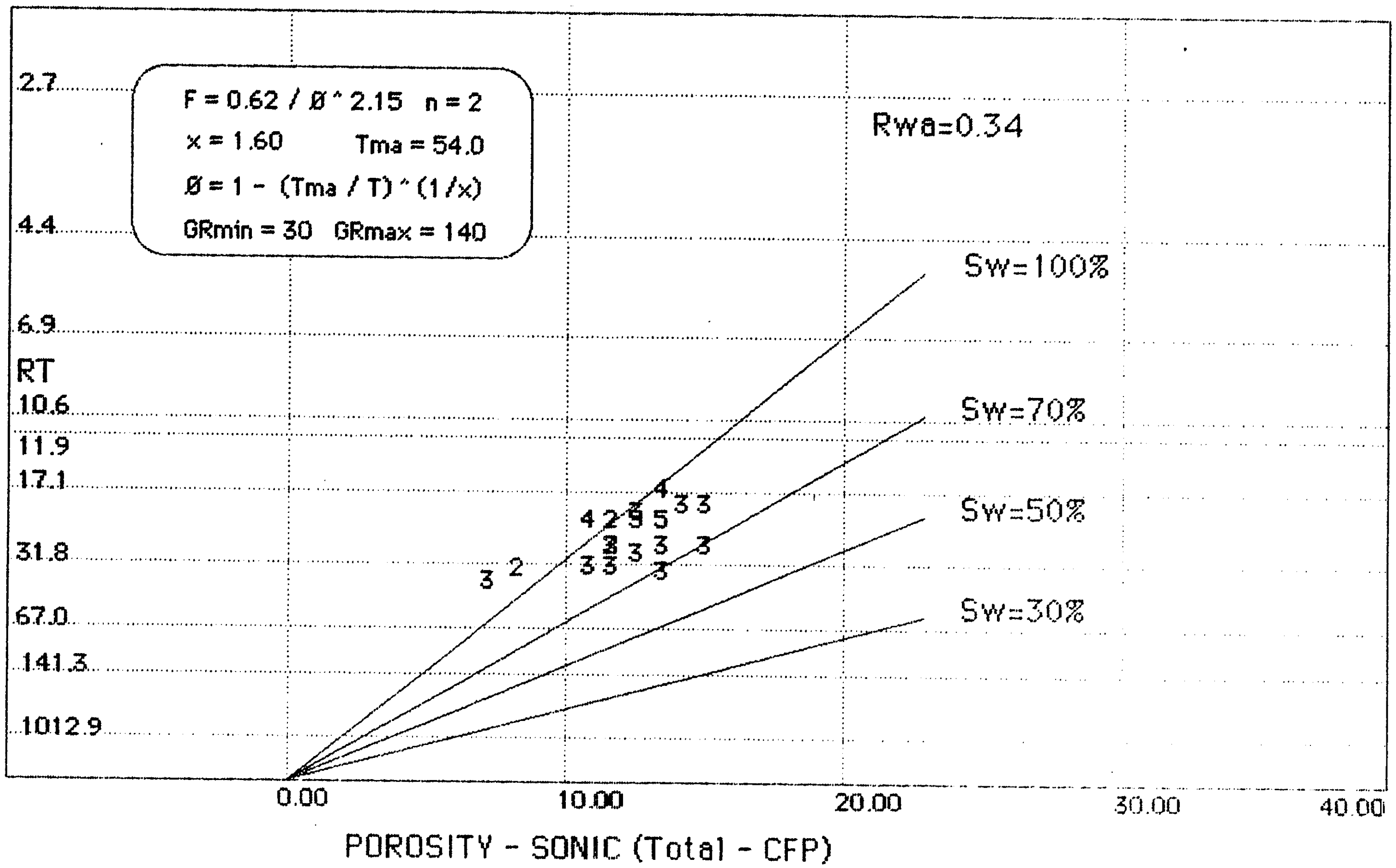
WINDERMERE 2   M. EUMERALLA

Mud filtrate density=1.00 g/cc.
Surface temperature=70.00 degrees F.   Bottom hole temperature=280.00 degrees F.
Surface depth=0.00 meters.   Depth logger=3595.00 meters.

DATA LISTING

Depth meters	MSFL	LLS	LLD	RT	RHOB	NPHIls	NPHIc	GR	......	Sonic µsec/ft	Sonic µsec/ft	......	CALI
2529.00	35.00	35.00	35.00	35.00	2.56	21.00	23.38	71.0	0.0	61.000	61.0	0.0	0.00
2530.00	31.00	31.00	31.00	31.00	2.61	14.00	15.65	60.0	0.0	62.000	62.0	0.0	0.00
2531.00	30.00	30.00	30.00	30.00	2.54	15.00	17.01	64.0	0.0	65.000	65.0	0.0	0.00
2532.00	25.00	25.00	25.00	25.00	2.55	16.00	18.05	68.0	0.0	66.000	66.0	0.0	0.00
2533.00	25.00	25.00	25.00	25.00	2.51	18.00	20.36	66.0	0.0	68.000	68.0	0.0	0.00
2534.00	27.00	27.00	27.00	27.00	2.51	19.00	21.44	71.0	0.0	67.000	67.0	0.0	0.00
2535.00	30.00	30.00	30.00	30.00	2.50	19.00	21.48	66.0	0.0	66.000	66.0	0.0	0.00
2536.00	25.00	25.00	25.00	25.00	2.50	19.00	21.48	62.0	0.0	66.000	66.0	0.0	0.00
2537.00	20.00	20.00	20.00	20.00	2.55	18.00	20.21	85.0	0.0	68.000	68.0	0.0	0.00
2538.00	20.00	20.00	20.00	20.00	2.56	19.50	21.78	92.0	0.0	67.000	67.0	0.0	0.00
2539.00	20.00	20.00	20.00	20.00	2.55	20.00	22.36	75.0	0.0	65.000	65.0	0.0	0.00
2540.00	20.00	20.00	20.00	20.00	2.59	16.00	17.89	62.0	0.0	66.000	66.0	0.0	0.00
2541.00	16.00	16.00	16.00	16.00	2.54	18.50	20.79	75.0	0.0	68.000	68.0	0.0	0.00
2542.00	19.00	19.00	19.00	19.00	2.52	19.00	21.41	67.0	0.0	67.000	67.0	0.0	0.00
2543.00	18.00	18.00	18.00	18.00	2.54	18.50	20.79	66.0	0.0	69.000	69.0	0.0	0.00
2544.00	18.00	18.00	18.00	18.00	2.52	19.50	21.95	73.0	0.0	70.000	70.0	0.0	0.00
2545.00	25.00	25.00	25.00	25.00	2.52	20.50	23.03	72.0	0.0	70.000	70.0	0.0	0.00
2546.00	32.00	32.00	32.00	32.00	2.53	21.00	23.53	71.0	0.0	68.000	68.0	0.0	0.00
2547.00	30.00	30.00	30.00	30.00	2.52	21.00	23.57	65.0	0.0	66.000	66.0	0.0	0.00

WINDERMERE #2 EUMERALLA FM. (2529-2547 m.)



WINDERMERE 2 LOWER EUMERALLA

Vclay is minimum of Vclay from Rt, SP & GR. PHIE=(1-Vclay)*PHIT.
x=1.60 Tma=54.00 microsec/ft CFP-Total model.
GRclean=30.00 GRclay=140.00 SPclean=80.00 SPclay=50.00.
RWA=(RT*PHIT^2.15)/0.62 RMFA=(Rxo*PHIT^2.15)/0.62 Rclay=20.0.

PRE EVALUATION (Sonic porosity)

Depth meters	PHIT	VclayRt	VclaySP	VclayGR	Vclay	PHIE	RWA	RMFA
2529.00	7.3	57.1	100.00	37.3	37.3	4.6	0.205	0.205
2530.00	8.3	64.5	100.00	27.3	27.3	6.0	0.235	0.235
2531.00	10.9	66.7	100.00	30.9	30.9	7.6	0.416	0.416
2532.00	11.8	80.0	100.00	34.5	34.5	7.7	0.407	0.407
2533.00	13.4	80.0	100.00	32.7	32.7	9.0	0.537	0.537
2534.00	12.6	74.1	100.00	37.3	37.3	7.9	0.508	0.508
2535.00	11.8	66.7	100.00	32.7	32.7	7.9	0.488	0.488
2536.00	11.8	80.0	100.00	29.1	29.1	8.4	0.407	0.407
2537.00	13.4	100.0	100.00	50.0	50.0	6.7	0.430	0.430
2538.00	12.6	100.0	100.00	56.4	56.4	5.5	0.376	0.376
2539.00	10.9	100.0	100.00	40.9	40.9	6.5	0.277	0.277
2540.00	11.8	100.0	100.00	29.1	29.1	8.4	0.325	0.325
2541.00	13.4	100.0	100.00	40.9	40.9	7.9	0.344	0.344
2542.00	12.6	100.0	100.00	33.6	33.6	8.4	0.357	0.357
2543.00	14.2	100.0	100.00	32.7	32.7	9.6	0.437	0.437
2544.00	15.0	100.0	100.00	39.1	39.1	9.1	0.490	0.490
2545.00	15.0	80.0	100.00	38.2	38.2	9.3	0.680	0.680
2546.00	13.4	62.5	100.00	37.3	37.3	8.4	0.688	0.688
2547.00	11.8	66.7	100.00	31.8	31.8	8.0	0.488	0.488

WINDERMERE 2 LOWER EUMERALLA

Vclay is min. of Vclay from SP, GR & Rt. PHIE=(1-Vclay)*PHIT.
GRclean=30.00 GRclay=140.00 SPclean=80.00 SPclay=50.00 Rtclay=20.000.
Rw=0.340 everywhere except from 0.00 to 0.00 where Rw=0.200.
Rmf=0.800 a=0.62 m=2.15 n=2.00.
PHIE cutoff sets Sw and Sxo to 100% below 0.0 % porosity.
Coal is detected if (RHOB<1.50 and RHOB<>0) or if NPHI>55.0
or if Sonic>90.0 microsec/ft. SPclean=80.00 SPclay=50.00
(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*Swind^(n/2)
b=1-(Vclay/2)
**** Sonic porosity x=1.60 Tma=54.00 microsec/ft CFP-Total model.

EVALUATION (Sonic porosity)

Depth meters	RHOma	PHIT	Vclay	PHIE	Swind	Sxoind
2529.00	****	7.3	37.3	4.6	94.0	100.0
2530.00	****	8.3	27.3	6.0	100.0	100.0
2531.00	****	10.9	30.9	7.6	83.5	100.0
2532.00	****	11.8	34.5	7.7	86.4	100.0
2533.00	****	13.4	32.7	9.0	79.4	100.0
2534.00	****	12.6	37.3	7.9	79.3	99.7
2535.00	****	11.8	32.7	7.9	79.2	100.0
2536.00	****	11.8	29.1	8.4	87.3	100.0
2537.00	****	13.4	50.0	6.7	88.6	100.0
2538.00	****	12.6	56.4	5.5	91.4	100.0
2539.00	****	10.9	40.9	6.5	99.6	100.0
2540.00	****	11.8	29.1	8.4	97.7	100.0
2541.00	****	13.4	40.9	7.9	99.0	100.0
2542.00	****	12.6	33.6	8.4	94.9	100.0
2543.00	****	14.2	32.7	9.6	89.8	100.0
2544.00	****	15.0	39.1	9.1	87.0	100.0
2545.00	****	15.0	38.2	9.3	73.7	94.1
2546.00	****	13.4	37.3	8.4	70.0	88.6
2547.00	****	11.8	31.8	8.0	79.3	100.0

<u>WINDERMERE MEMBER</u>

3180 - 3194 metres

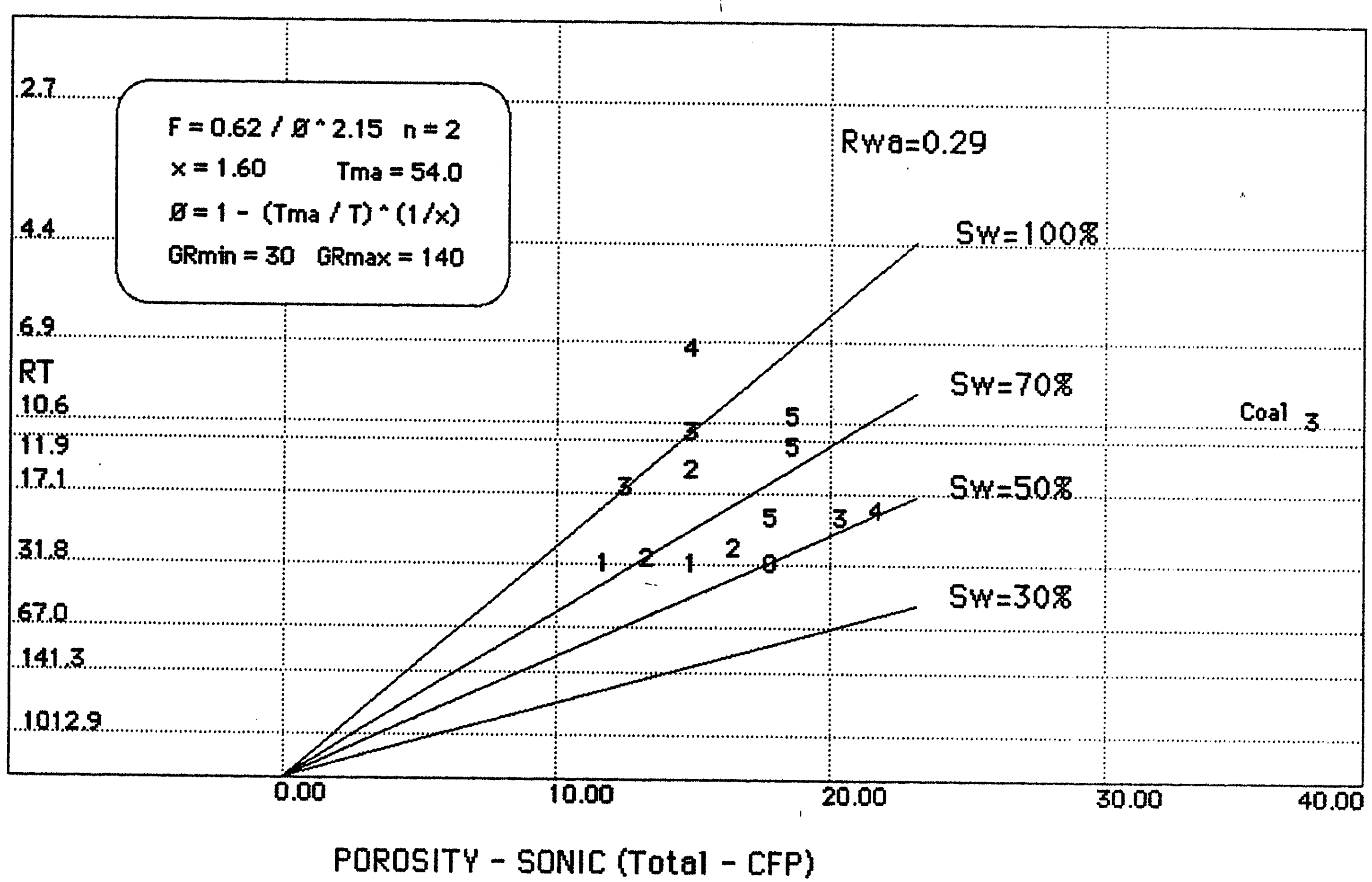
WINDERMERE 2 L. EUMERALLA

Mud filtrate density=1.00 g/cc.
Surface temperature=70.00 degrees F. Bottom hole temperature=280.00 degrees F.
Surface depth=0.00 meters. Depth logger=3595.00 meters.

DATA LISTING

Depth meters	MSFL	LLS	LLD	RT	RHOB	NPHIls	NPHIc	GR	......	Sonic µsec/ft	Sonic µsec/ft	......	CALI
3180.00	1.80	7.00	7.00	7.00	0.00	0.00	0.00	79.0	0.0	70.000	70.0	0.0	0.00
3181.00	1.50	10.00	10.00	10.00	0.00	0.00	0.00	65.0	0.0	115.000	115.0	0.0	0.00
3182.00	1.40	19.00	19.00	19.00	0.00	0.00	0.00	75.0	0.0	80.000	80.0	0.0	0.00
3183.00	1.00	10.00	10.00	10.00	0.00	0.00	0.00	93.0	0.0	75.000	75.0	0.0	0.00
3184.00	1.80	12.00	12.00	12.00	0.00	0.00	0.00	87.0	0.0	75.000	75.0	0.0	0.00
3185.00	2.50	16.00	16.00	16.00	0.00	0.00	0.00	64.0	0.0	67.000	67.0	0.0	0.00
3186.00	2.20	20.00	20.00	20.00	0.00	0.00	0.00	71.0	0.0	78.000	78.0	0.0	0.00
3187.00	2.00	11.00	11.00	11.00	0.00	0.00	0.00	68.0	0.0	70.000	70.0	0.0	0.00
3188.00	8.00	20.00	20.00	20.00	0.00	0.00	0.00	85.0	0.0	74.000	74.0	0.0	0.00
3189.00	3.00	26.00	26.00	26.00	0.00	0.00	0.00	56.0	0.0	72.000	72.0	0.0	0.00
3190.00	20.00	30.00	30.00	30.00	0.00	0.00	0.00	51.0	0.0	66.000	66.0	0.0	0.00
3191.00	4.00	30.00	30.00	30.00	0.00	0.00	0.00	45.0	0.0	70.000	70.0	0.0	0.00
3192.00	3.00	30.00	30.00	30.00	0.00	0.00	0.00	40.0	0.0	74.000	74.0	0.0	0.00
3193.00	4.00	29.00	29.00	29.00	0.00	0.00	0.00	52.0	0.0	68.000	68.0	0.0	0.00
3194.00	5.00	14.00	14.00	14.00	0.00	0.00	0.00	54.0	0.0	70.000	70.0	0.0	0.00

WINDERMERE #2 WINDERMERE MEMBER (3180-3194 m.)



WINDERMERE 2 WINDERMERE MEMBER

Vclay is minimum of Vclay from Rt, SP & GR. PHIE=(1-Vclay)*PHIT.

x=1.60 Tma=54.00 microsec/ft CFP-Total model.

GRclean=30.00 GRclay=140.00 SPclean=80.00 SPclay=50.00.

RWA=(RT*PHIT^2.15)/0.62 RMFA=(Rxo*PHIT^2.15)/0.62 Rclay=20.0.

PRE EVALUATION (Sonic porosity)

Depth meters	PHIT	VclayRt	VclaySP	VclayGR	Vclay	PHIE	RWA	RMFA
3180.00	15.0	100.0	100.00	44.5	44.5	8.3	0.190	0.049
3181.00	37.7	100.0	100.00	31.8	31.8	25.7	1.975	0.296
3182.00	21.8	100.0	100.00	40.9	40.9	12.9	1.157	0.085
3183.00	18.6	100.0	100.00	57.3	57.3	7.9	0.432	0.043
3184.00	18.6	100.0	100.00	51.8	51.8	8.9	0.518	0.078
3185.00	12.6	100.0	100.00	30.9	30.9	8.7	0.301	0.047
3186.00	20.5	100.0	100.00	37.3	37.3	12.9	1.073	0.118
3187.00	15.0	100.0	100.00	34.5	34.5	9.8	0.299	0.054
3188.00	17.9	100.0	100.00	50.0	50.0	8.9	0.796	0.318
3189.00	16.5	76.9	100.00	23.6	23.6	12.6	0.866	0.100
3190.00	11.8	66.7	100.00	19.1	19.1	9.5	0.488	0.325
3191.00	15.0	66.7	100.00	13.6	13.6	12.9	0.816	0.109
3192.00	17.9	66.7	100.00	9.1	9.1	16.2	1.194	0.119
3193.00	13.4	69.0	100.00	20.0	20.0	10.7	0.623	0.086
3194.00	15.0	100.0	100.00	21.8	21.8	11.7	0.381	0.136

WINDERMERE 2 WINDERMERE MEMBER

Vclay is min. of Vclay from SP, GR & Rt. PHIE=(1-Vclay)*PHIT.

GRclean=30.00 GRclay=140.00 SPclean=80.00 SPclay=50.00 Rtclay=20.000.

Rw=0.290 everywhere except from 0.00 to 0.00 where Rw=0.200.

Rmf=0.680 a=0.62 m=2.15 n=2.00.

PHIE cutoff sets Sw and Sxo to 100% below 0.0 % porosity.

Coal is detected if (RHOB<1.50 and RHOB<>0) or if NPHI>55.0

or if Sonic>90.0 microsec/ft. SPclean=80.00 SPclay=50.00

(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*SwInd^(n/2)

b=1-(Vclay/2)

**** Sonic porosity x=1.60 Tma=54.00 microsec/ft CFP-Total model.

EVALUATION (Sonic porosity)

Depth meters	RHOma	PHIT	Vclay	PHIE	SwInd	SxoInd
3180.00	****	15.0	44.5	8.3	100.0	100.0
3181.00	coal	coal	coal	coal	coal	coal
3182.00	****	21.8	40.9	12.9	62.0	100.0
3183.00	****	18.6	57.3	7.9	100.0	100.0
3184.00	****	18.6	51.8	8.9	92.1	100.0
3185.00	****	12.6	30.9	8.7	98.4	100.0
3186.00	****	20.5	37.3	12.9	62.0	100.0
3187.00	****	15.0	34.5	9.8	100.0	100.0
3188.00	****	17.9	50.0	8.9	72.4	100.0
3189.00	****	16.5	23.6	12.6	62.0	100.0
3190.00	****	11.8	19.1	9.5	76.5	100.0
3191.00	****	15.0	13.6	12.9	61.6	100.0
3192.00	****	17.9	9.1	16.2	51.1	100.0
3193.00	****	13.4	20.0	10.7	69.6	100.0
3194.00	****	15.0	21.8	11.7	91.3	100.0

CRAYFISH FORMATION

3316 - 3325 metres

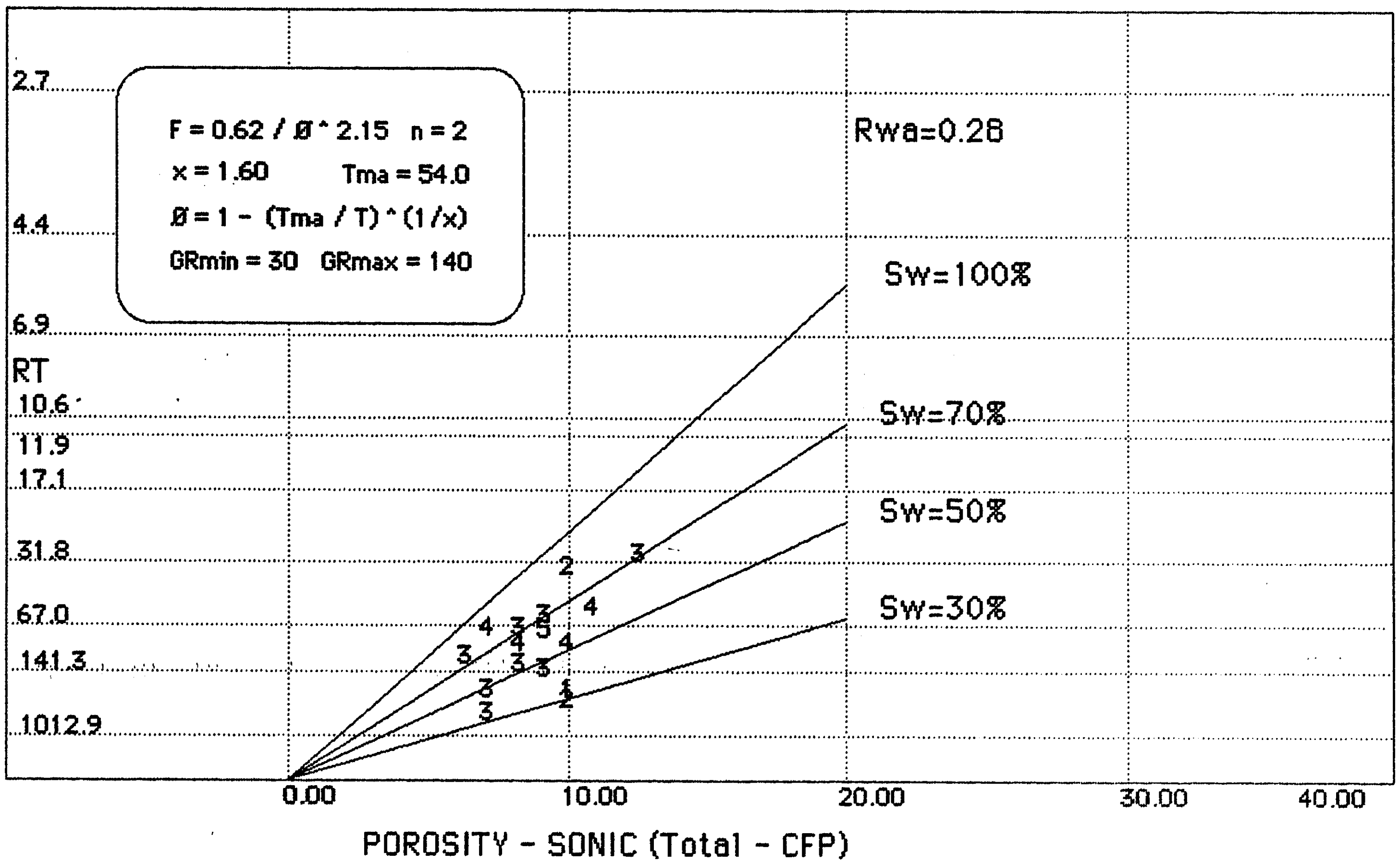
WINDERMERE 2

Mud filtrate density=1.00 g/cc.
Surface temperature=70.00 degrees F. Bottom hole temperature=280.00 degrees F.
Surface depth=0.00 meters. Depth logger=3595.00 meters.

DATA LISTING

Depth meters	MSFL	LLS	LLD	RT	RHOB	NPHIls	NPHIc	GR	......	Sonic µsec/ft	Sonic µsec/ft	......	CALI
3316.50	20.00	55.00	75.00	98.79	0.00	0.00	0.00	65.0	0.0	60.000	60.0	0.0	12.00
3317.00	10.00	50.00	65.00	81.77	0.00	0.00	0.00	69.0	0.0	64.000	64.0	0.0	12.00
3317.50	8.00	42.00	45.00	49.50	0.00	0.00	0.00	85.0	0.0	65.000	65.0	0.0	12.20
3318.00	7.00	50.00	50.00	50.00	0.00	0.00	0.00	77.0	0.0	65.000	65.0	0.0	12.00
3318.50	10.00	80.00	100.00	123.88	0.00	0.00	0.00	60.0	0.0	63.000	63.0	0.0	14.00
3319.00	8.00	50.00	90.00	114.78	0.00	0.00	0.00	60.0	0.0	62.000	62.0	0.0	15.00
3319.50	3.00	45.00	65.00	80.24	0.00	0.00	0.00	65.0	0.0	62.000	62.0	0.0	14.00
3320.00	3.00	45.00	55.00	67.56	0.00	0.00	0.00	67.0	0.0	63.000	63.0	0.0	14.00
3320.50	4.00	70.00	55.00	55.00	0.00	0.00	0.00	73.0	0.0	63.000	63.0	0.0	12.50
3321.00	5.00	100.00	65.00	65.00	0.00	0.00	0.00	71.0	0.0	62.000	62.0	0.0	11.80
3321.50	45.00	100.00	65.00	65.00	0.00	0.00	0.00	76.0	0.0	61.000	61.0	0.0	11.60
3322.00	50.00	90.00	65.00	65.00	0.00	0.00	0.00	78.0	0.0	61.000	61.0	0.0	11.50
3322.50	55.00	80.00	120.00	191.88	0.00	0.00	0.00	77.0	0.0	61.000	61.0	0.0	11.50
3323.00	80.00	85.00	170.00	340.00	0.00	0.00	0.00	71.0	0.0	61.000	61.0	0.0	11.20
3323.50	5.00	95.00	200.00	247.84	0.00	0.00	0.00	60.0	0.0	64.000	64.0	0.0	11.20
3324.00	10.00	90.00	150.00	187.95	0.00	0.00	0.00	48.0	0.0	64.000	64.0	0.0	14.00
3324.50	6.00	32.00	32.00	32.00	0.00	0.00	0.00	53.0	0.0	64.000	64.0	0.0	14.50
3325.00	5.00	28.00	28.00	28.00	0.00	0.00	0.00	60.0	0.0	67.000	67.0	0.0	13.50

WINDERMERE #2 CRAYFISH FM. (3316-3325 m.)



WINDERMERE 2 CRAYFISH FORMATION

Vclay is minimum of Vclay from Rt, SP & GR. PHIE=(1-Vclay)*PHIT.

x=1.60 Tma=54.00 microsec/ft CFP-Total model.

GRclean=30.00 GRclay=140.00 SPclean=80.00 SPclay=50.00.

RWA=(RT*PHIT^2.15)/0.62 RMFA=(Rxo*PHIT^2.15)/0.62 Rclay=20.0.

PRE EVALUATION (Sonic porosity)

Depth meters	PHIT	VclayRt	VclaySP	VclayGR	Vclay	PHIE	RWA	RMFA
3316.50	6.4	28.4	100.00	31.8	28.4	4.6	0.428	0.087
3317.00	10.1	30.4	100.00	35.5	30.4	7.0	0.949	0.116
3317.50	10.9	40.4	100.00	50.0	40.4	6.5	0.686	0.111
3318.00	10.9	40.0	100.00	42.7	40.0	6.6	0.693	0.097
3318.50	9.2	26.1	100.00	27.3	26.1	6.8	1.178	0.095
3319.00	8.3	26.9	100.00	27.3	26.9	6.1	0.872	0.061
3319.50	8.3	30.6	100.00	31.8	30.6	5.7	0.609	0.023
3320.00	9.2	32.4	100.00	33.6	32.4	6.2	0.643	0.029
3320.50	9.2	34.6	100.00	39.1	34.6	6.0	0.523	0.038
3321.00	8.3	32.8	100.00	37.3	32.8	5.6	0.494	0.038
3321.50	7.3	32.8	100.00	41.8	32.8	4.9	0.381	0.264
3322.00	7.3	32.8	100.00	43.6	32.8	4.9	0.381	0.293
3322.50	7.3	21.5	100.00	42.7	21.5	5.8	1.125	0.323
3323.00	7.3	15.5	100.00	37.3	15.5	6.2	1.994	0.469
3323.50	10.1	18.8	100.00	27.3	18.8	8.2	2.875	0.058
3324.00	10.1	21.7	100.00	16.4	16.4	8.4	2.181	0.116
3324.50	10.1	62.5	100.00	20.9	20.9	8.0	0.371	0.070
3325.00	12.6	71.4	100.00	27.3	27.3	9.2	0.527	0.094

WINDERMERE 2 CRAYFISH FORMATION

Vclay is min. of Vclay from SP, GR & Rt. PHIE=(1-Vclay)*PHIT.
GRclean=30.00 GRclay=140.00 SPclean=80.00 SPclay=50.00 Rtclay=20.000.
Rw=0.280 everywhere except from 0.00 to 0.00 where Rw=0.200.
Rmf=0.660 a=0.62 m=2.15 n=2.00.
PHIE cutoff sets Sw and Sxo to 100% below 0.0 % porosity.
Coal is detected if (RHOB<1.50 and RHOB<>0) or if NPHI>55.0
or if Sonic>90.0 microsec/ft. SPclean=80.00 SPclay=50.00
(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*SwInd^(n/2)
b=1-(Vclay/2)
**** Sonic porosity x=1.60 Tma=54.00 microsec/ft CFP-Total model.

EVALUATION (Sonic porosity)

Depth meters	RHOma	PHIT	Vclay	PHIE	SwInd	SxoInd
3316.50	****	6.4	28.4	4.6	61.8	100.0
3317.00	****	10.1	30.4	7.0	50.4	100.0
3317.50	****	10.9	40.4	6.5	60.2	100.0
3318.00	****	10.9	40.0	6.6	60.0	100.0
3318.50	****	9.2	26.1	6.8	44.3	100.0
3319.00	****	8.3	26.9	6.1	49.3	100.0
3319.50	****	8.3	30.6	5.7	57.8	100.0
3320.00	****	9.2	32.4	6.2	58.5	100.0
3320.50	****	9.2	34.6	6.0	64.3	100.0
3321.00	****	8.3	32.8	5.6	63.4	100.0
3321.50	****	7.3	32.8	4.9	68.0	99.7
3322.00	****	7.3	32.8	4.9	68.0	94.5
3322.50	****	7.3	21.5	5.8	42.9	100.0
3323.00	****	7.3	15.5	6.2	33.7	94.3
3323.50	****	10.1	18.8	8.2	30.0	100.0
3324.00	****	10.1	16.4	8.4	34.7	100.0
3324.50	****	10.1	20.9	8.0	82.9	100.0
3325.00	****	12.6	27.3	9.2	73.6	100.0

CRAYFISH FORMATION

3529 - 3552 metres

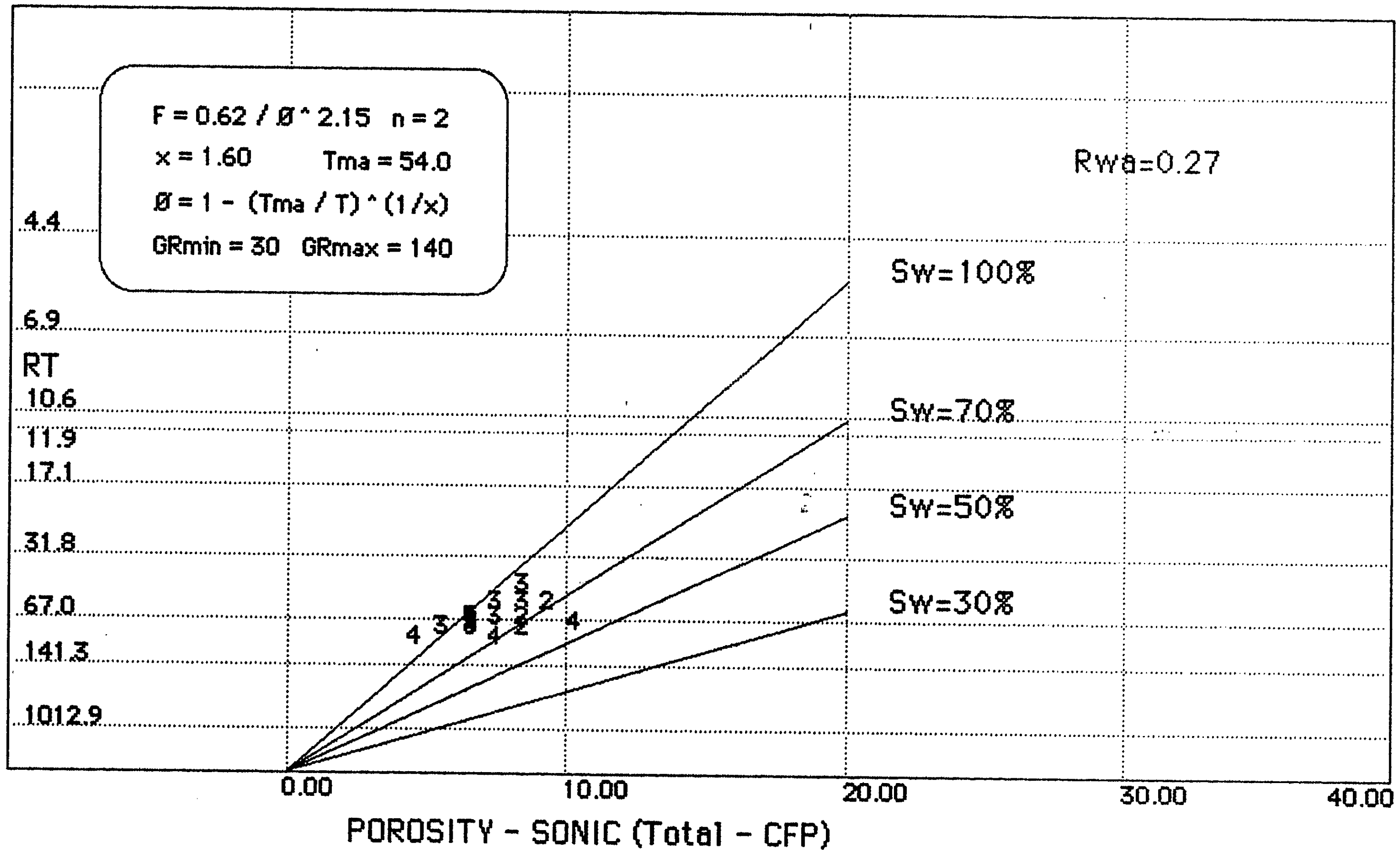
WINDERMERE 2

Mud filtrate density=1.00 g/cc.
Surface temperature=70.00 degrees F. Bottom hole temperature=280.00 degrees F.
Surface depth=0.00 meters. Depth logger=3595.00 meters.

DATA LISTING

Depth meters	MSFL	LLS	LLD	RT	RHOB	NPHIls	NPHIc	GR	......	Sonic µsec/ft	Sonic µsec/ft	......	CALI
3529.00	70.00	70.00	70.00	70.00	2.56	8.00	10.03	60.0	0.0	62.000	62.0	0.0	0.00
3530.00	60.00	60.00	60.00	60.00	2.55	11.00	13.40	60.0	0.0	62.000	62.0	0.0	0.00
3531.00	60.00	60.00	60.00	60.00	2.57	10.50	12.73	72.0	0.0	60.000	60.0	0.0	0.00
3532.00	50.00	50.00	50.00	50.00	2.56	9.00	11.13	65.0	0.0	62.000	62.0	0.0	0.00
3533.00	50.00	50.00	50.00	50.00	2.57	9.50	11.62	65.0	0.0	62.000	62.0	0.0	0.00
3534.00	65.00	65.00	65.00	65.00	2.56	11.00	13.35	85.0	0.0	64.000	64.0	0.0	0.00
3535.00	60.00	60.00	60.00	60.00	2.55	13.00	15.62	70.0	0.0	61.000	61.0	0.0	0.00
3536.00	50.00	50.00	50.00	50.00	2.59	9.00	10.95	70.0	0.0	61.000	61.0	0.0	0.00
3537.00	50.00	50.00	50.00	50.00	2.57	9.50	11.63	68.0	0.0	61.000	61.0	0.0	0.00
3538.00	40.00	40.00	40.00	40.00	2.57	9.50	11.63	67.0	0.0	62.000	62.0	0.0	0.00
3539.00	15.00	50.00	50.00	50.00	2.56	10.00	12.24	55.0	0.0	63.000	63.0	0.0	0.00
3540.00	50.00	50.00	50.00	50.00	2.59	9.00	10.96	70.0	0.0	61.000	61.0	0.0	0.00
3541.00	50.00	50.00	50.00	50.00	2.59	9.50	11.51	70.0	0.0	61.000	61.0	0.0	0.00
3542.00	60.00	60.00	60.00	60.00	2.59	10.00	12.07	75.0	0.0	60.000	60.0	0.0	0.00
3543.00	20.00	50.00	50.00	50.00	2.57	9.50	11.63	67.0	0.0	62.000	62.0	0.0	0.00
3544.00	15.00	60.00	60.00	60.00	2.58	10.50	12.68	75.0	0.0	60.000	60.0	0.0	0.00
3545.00	20.00	80.00	80.00	80.00	2.58	10.00	12.13	80.0	0.0	58.000	58.0	0.0	0.00
3546.00	10.00	60.00	60.00	60.00	2.60	11.50	13.68	88.0	0.0	60.000	60.0	0.0	0.00
3547.00	10.00	80.00	80.00	80.00	2.57	13.00	15.52	77.0	0.0	61.000	61.0	0.0	0.00
3548.00	70.00	70.00	70.00	70.00	2.56	11.00	13.36	73.0	0.0	59.000	59.0	0.0	0.00
3549.00	70.00	70.00	70.00	70.00	2.57	9.00	11.08	72.0	0.0	60.000	60.0	0.0	0.00
3550.00	60.00	60.00	60.00	60.00	2.59	8.50	10.41	71.0	0.0	60.000	60.0	0.0	0.00
3551.00	65.00	65.00	65.00	65.00	2.56	10.50	12.81	92.0	0.0	60.000	60.0	0.0	0.00
3552.00	70.00	70.00	70.00	70.00	2.59	10.50	12.63	80.0	0.0	60.000	60.0	0.0	0.00

WINDERMERE #2 CRAYFISH FM. (3529-3550 m.)



WINDERMERE 2 CRAYFISH FORMATION

Vclay is minimum of Vclay from Rt, SP & GR. PHIE=(1-Vclay)*PHIT.

x=1.60 Tma=54.00 microsec/ft CFP-Total model.

GRclean=30.00 GRclay=140.00 SPclean=80.00 SPclay=50.00.

RWA=(RT*PHIT^2.15)/0.62 RMFA=(Rxo*PHIT^2.15)/0.62 Rclay=20.0.

PRE EVALUATION (Sonic porosity)

Depth meters	PHIT	VclayRt	VclaySP	VclayGR	Vclay	PHIE	RWA	RMFA
3529.00	8.3	32.0	100.00	27.3	27.3	6.0	0.532	0.532
3530.00	8.3	33.7	100.00	27.3	27.3	6.0	0.456	0.456
3531.00	6.4	33.7	100.00	38.2	33.7	4.2	0.260	0.260
3532.00	8.3	40.0	100.00	31.8	31.8	5.6	0.380	0.380
3533.00	8.3	40.0	100.00	31.8	31.8	5.6	0.380	0.380
3534.00	10.1	32.8	100.00	50.0	32.8	6.8	0.754	0.754
3535.00	7.3	33.7	100.00	36.4	33.7	4.9	0.352	0.352
3536.00	7.3	40.0	100.00	36.4	36.4	4.7	0.293	0.293
3537.00	7.3	40.0	100.00	34.5	34.5	4.8	0.293	0.293
3538.00	8.3	50.0	100.00	33.6	33.6	5.5	0.304	0.304
3539.00	9.2	40.0	100.00	22.7	22.7	7.1	0.476	0.143
3540.00	7.3	40.0	100.00	36.4	36.4	4.7	0.293	0.293
3541.00	7.3	40.0	100.00	36.4	36.4	4.7	0.293	0.293
3542.00	6.4	33.7	100.00	40.9	33.7	4.2	0.260	0.260
3543.00	8.3	40.0	100.00	33.6	33.6	5.5	0.380	0.152
3544.00	6.4	33.7	100.00	40.9	33.7	4.2	0.260	0.065
3545.00	4.4	30.6	100.00	45.5	30.6	3.0	0.154	0.038
3546.00	6.4	33.7	100.00	52.7	33.7	4.2	0.260	0.043
3547.00	7.3	30.6	100.00	42.7	30.6	5.1	0.469	0.059
3548.00	5.4	32.0	100.00	39.1	32.0	3.7	0.211	0.211
3549.00	6.4	32.0	100.00	38.2	32.0	4.3	0.303	0.303
3550.00	6.4	33.7	100.00	37.3	33.7	4.2	0.260	0.260
3551.00	6.4	32.8	100.00	56.4	32.8	4.3	0.282	0.282
3552.00	6.4	32.0	100.00	45.5	32.0	4.3	0.303	0.303

WINDERMERE 2 CRAYFISH FORMATION

Vclay is min. of Vclay from SP, GR & Rt. PHIE=(1-Vclay)*PHIT.
GRclean=30.00 GRclay=140.00 SPclean=80.00 SPclay=50.00 Rtclay=20.000.
Rw=0.270 everywhere except from 0.00 to 0.00 where Rw=0.200.
Rmf=0.640 a=0.62 m=2.15 n=2.00.
PHIE cutoff sets Sw and Sxo to 100% below 0.0 % porosity.
Coal is detected if (RHOB<1.50 and RHOB<>0) or if NPHI>55.0
or if Sonic>90.0 microsec/ft. SPclean=80.00 SPclay=50.00
(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*SwInd^(n/2)
b=1-(Vclay/2)
**** Sonic porosity x=1.60 Tma=54.00 microsec/ft CFP-Total model.

EVALUATION (Sonic porosity)

Depth meters	RHOma	PHIT	Vclay	PHIE	SwInd	SxoInd
3529.00	****	8.3	27.3	6.0	62.3	79.6
3530.00	****	8.3	27.3	6.0	67.3	86.0
3531.00	****	6.4	33.7	4.2	75.1	90.1
3532.00	****	8.3	31.8	5.6	72.0	89.8
3533.00	****	8.3	31.8	5.6	72.0	89.8
3534.00	****	10.1	32.8	6.8	55.6	70.5
3535.00	****	7.3	33.7	4.9	69.7	84.9
3536.00	****	7.3	36.4	4.7	75.1	90.3
3537.00	****	7.3	34.5	4.8	75.9	92.1
3538.00	****	8.3	33.6	5.5	79.7	98.5
3539.00	****	9.2	22.7	7.1	69.9	100.0
3540.00	****	7.3	36.4	4.7	75.1	90.3
3541.00	****	7.3	36.4	4.7	75.1	90.3
3542.00	****	6.4	33.7	4.2	75.1	90.1
3543.00	****	8.3	33.6	5.5	71.3	100.0
3544.00	****	6.4	33.7	4.2	75.1	100.0
3545.00	****	4.4	30.6	3.0	80.4	100.0
3546.00	****	6.4	33.7	4.2	75.1	100.0
3547.00	****	7.3	30.6	5.1	61.6	100.0
3548.00	****	5.4	32.0	3.7	76.7	91.0
3549.00	****	6.4	32.0	4.3	70.5	85.2
3550.00	****	6.4	33.7	4.2	75.1	90.1
3551.00	****	6.4	32.8	4.3	72.6	87.5
3552.00	****	6.4	32.0	4.3	70.5	85.2

APPENDIX I

APPENDIX I

CASING AND CEMENTING REPORTS AND BIT RECORD

MINORA RESOURCES NL

WELL CASING REPORT

WELL NAME/NO: WINDERMERE NO.2 PERMIT/FIELD PEP111 DATE: 11/3/89

CASING SIZE: 13 3/8" (INS), BIT SIZE: 17 1/2" (INS), DEPTH: 341 (M)

RIG NAME: ATCO A2, ~~RKB-SEABED~~ G/level 5.51 (M), SUPERVISOR: J E OZOLINS

START ~~RIG UP &~~ RUN CASING @ 1900hrs 10/3/89 HR FINISH ~~LAND~~ CASING @ 0430 11/3/89 HRS (9½hrs total)

CIP @ 0900 11/389

NO JOINTS	DESCRIPTION	COUPLING THREAD	CASING WEIGHT LB/FT	CASING GRADE	LENGTH (M)	DEPTH M. BRT.
	DEPTH BOTTOM SHOE					313.93
	FLOAT SHOE - HALLIBURTON	BTC		N80	0.43	313.50
1	R3 CASING	BTC	68	K55	12.04	301.46
	FLOAT COLLAR - HALLIBURTON	BTC		N80	0.32	301.14
24	R3 CASING	BTC	68 & 72	K55	275.71	25.43
1	PUP	BTC	68	K55	4.62	20.81
1	PUP	BTC	68	K55	3.09	17.72
1	R3 CASING (COLLAR REMOVED)	BTC	68	K55	11.30	6.42
	BRADENHEAD FMC 3000psi	BTC			0.37	6.05
	KB TO BRADENHEAD FLANGE				6.05	0

	NO. OF JOINTS	LENGTH (M)	PUP JOINTS
TOTAL CASING ON BOARD	30		2
TOTAL CASING RUN	26		2
TOTAL CASING LEFT:	4 (WOULD NOT DRIFT 12.282")		-

CENTRALISERS: QUANTITY: 6 MAKE: HOWCO TYPE: SPRING BOW

SECTION(S) COVERED: LOCATED AT 311, 298, 290, 278, 267, and 11m

SPACING:

COMMENTS: THREADLOCKED: FLOAT SHOE - JT #1 - FLOAT COLLAR - JT #2 - JT# 3

MINORA RESOURCES NL

WELL CASING REPORT

WELL NAME/NO: WINDERMERE No.2 PERMIT/FIELD PEP111 DATE: 24/3/89

CASING SIZE: 9 5/8" (INS), BIT SIZE: 12 1/4" (INS), DEPTH: 1869 (M)

RIG NAME: ATCO A2, RKB-~~SEABED~~ GL 5.51 (M), SUPERVISOR: J OZOLINS

RIG UP & RUN CASING @ 17.30 23/3/89 HR LAND CASING @ 20.00 24/3/89 HRS

NO JOINTS	DESCRIPTION	COUPLING THREAD	CASING WEIGHT LB/FT	CASING GRADE	LENGTH (M)	DEPTH M.
	DEPTH BOTTOM SHOE					1867.00
	FLOAT SHOE (HALLIBURTON)	BUTTRESS		N80	0.44	1866.56
1	9 5/8" CASING	BUTTRESS	47	N80	11.57	1854.99
	FLOAT COLLAR (HALLIBURTON)	BUTTRESS		N80	0.32	1854.67
1	9 5/8" CASING	BUTTRESS	47	N80	11.91	1842.76
	SHUT OFF BAFFLE(HALLIBURTON)	BUTTRESS		N80	INSERT	1842.76
68	9 5/8" CASING	BUTTRESS	47	N80	803.70	1039.06
	DV STAGE CEMENTING COLLAR	BUTTRESS		N80	1.04	1038.02
88	9 5/8" CASING	BUTTRESS	47	N80	1032.07	5.95
	(Top joint cut off 6" above					
	Bradenhead Hanger)					
	KB TO 6" ABOVE BRADENHEAD					
	FLANGE (6.05-.15)				5.95	0

	NO. OF JOINTS	LENGTH (M)	PUP JOINTS
TOTAL CASING ON BOARD	170		2
TOTAL CASING RUN	158		-
TOTAL CASING LEFT:	12		2

CENTRALISERS: QUANTITY: 12 total MAKE: HALLIBURTON TYPE: SPRING BOW

SECTION(S) COVERED: Used 4 stop collars

SPACING: LOCATED AT: 1864, 1851, 1843, 1831, 1819, 1807 (ABOVE SHOE)
1035, 1026, 1014, 1002, 991 (ABOVE STAGE COLLAR)
& 308m (INSIDE SURFACE CASING)

COMMENTS:

THREADLOCKED: FS-JT 1 - FC - JT 2 - JT 3
and JT 70 - DV stage collar - JT 71 - JT 72

STRING WEIGHT: INDICATOR 254000 BLOCKS 18000 = 236,000lbs Prior to cementing

LANDING TENSION: INDICATOR 290000 BLOCKS 18000 = 272,000lbs when setting casing slips
(HAD TO WORK SLIPS IN FOR EVEN LOADING ON SLIP SEGMENTS)

MINORA RESOURCES NL

WELL CEMENTING REPORT

WELL NAME/NO: WINDERMERE NO.2 PERMIT/FIELD PEP111 DATE: 11/3/89

JOB: SURFACE CASING CASING SIZE: 13 3/8 (INS). WEIGHT: 68 & 72 LB/FT. GRADE: K55

RIG NAME: ATCO A 2 CEMENT COMPANY: HALLIBURTON CEMENTER: B HOOVER

TOOL PUSHER(S): K MURPHY CO. SUPERVISOR: JURIS OZOLINS

WELL DEPTH: 341 (M) BIT SIZE: 17 1/2 (INS)

CONDUCTOR ~~LAST CASING~~ SET AT: 10 (M), SIZE: 20 (IN) WEIGHT: 94 (LB/FT) GRADE: -

MUD DETAILS (PRIOR TO CEMENTING)

MUD TYPE: SPUD MUD, DENSITY (IN) 9.1 (LB/GAL), (OUT) 9.1 (LB/GAL)

VISCOSITY: 46 (SEC), PV: 10 CPS, YP: 27 LB/100 FT^2 GELS 14/24 LB/100 FT^2

CEMENT DATA:

1. SINGLE STAGE [X] 2. TWO STAGE [ ] 3. PLUG [ ] 4. SQUEEZE [ ]

INTERVAL CEMENTED:

1. LEAD FROM: 264 M TO 6 M TOTAL: 258 REMARKS: FILLER TO CELLAR FLOOR
   TAIL FROM: 314 M TO 264 M TOTAL: 50 REMARKS: NEAT
2. LEAD FROM: M TO M TOTAL: REMARKS:
   TAIL FROM: M TO M TOTAL: REMARKS:

	CEMENT (CLASS)	SACKS (NO:)	YIELD (CU FT/SX)	SLURRY VOLUME (CU FT)	SLURRY DENSITY (LB/GAL)	ADDITIVES & AMOUNT DRY BLENDED
1. LEAD	G	413	2.90	1198	11.4	n/a
TAIL	G	227	1.15	261	15.8	n/a
2. TOP UP ~~LEAD~~	G	68	1.15	101	15.8	n/a
TAIL	G	20	(left on ground in case further top-up required)			

	MIXWATER (TYPE)	MIXWATER (GAL/SX)	TOTAL MIXWATER (BBL)	ADDITIVES & AMOUNT PREMIXED IN WATER
1. LEAD	4.3% Bentonite (BWOW)	17.7	174	27sx Magcogel (2700#)
TAIL	Neat	5.0	27	-
2. TOPUP ~~LEAD~~	4% CaCl² (BWOW)	5.0	8	2 sx Calcium Chloride (110#)
TAIL	(Also used part of 1 pail of NFI in gel mix water)			

VOLUMES:

	CALIPER		EXCESS	TOTAL		CALCULATED		OPEN HOLE EXCESS	TOTAL		TOTAL CEMENT	
1.		CU FT	%		CU FT :	705	CU FT	100 %	1410	CU FT	1444	CU FT
2.		CU FT	%		CU FT :		CU FT	SHOE JT %	34	CU FT		CU FT

DETAILS PRE FLUSH 1) 50 bbls water 2)

DISPLACEMENT: (6m Stick up)

	CALCULATED (BBL)	ACTUAL (BBL)	CEMENT UNIT	RIG PUMP
1.	150.8	150.8	2	148.8
2.				

Used No.1 pumps: 6x8½ = 3.12gals/stk
Bumped at 2078 strokes
Calc.pump efficiency = 96.4%

JOB SUMMARY:

OPERATION	TIME (HR)	RATE (BPM)	PRESSURE (PSI)	OPERATION	TIME (HR)	RATE (BPM)	PRESSURE (PSI)
PUMP 50bbls WATER (RIG)	FROM 0650	7	300	HALLIBURTON PUMP 2bbls	FROM 0822		
PRES.TEST LINES TO 3000	0700			DISPLACE WITH RIG PUMP	0825	5	600
START MIXING GEL CMT	0715			PUMP PLUG	0855	5	2000
STOP TO TAKE ON WATER							
FOR NEXT CEMENT	0743			CIP 0855 hrs 11/3/89			
CLEAR CEMENT TRANS.LINE	0747			3000psi press.test10min	0855		3000
START MIXING NEXT CEMENT	0808						
FINISH MIXING	0820			TOP UP THROUGH 13m STINGER 1600			
RELEASE TOP PLUG	0822						

COMMENTS: CEMENT CONTAMINATED RETURNS STARTED 153bbls before plug bumped. Est.146 bbls good cement returns = 786 cuft - only used 705 cuft excess. Expect some channelling took place. Nevertheless, 100% excess could be reduced in future.

MINORA RESOURCES NL

WELL CEMENTING REPORT

WELL NAME/NO: WINDERMERE NO.2 PERMIT/FIELD PEP111 DATE: 24/3/89

JOB: INTERMEDIATE CASING CASING SIZE: 9 5/8" (INS). WEIGHT: 47 LB/FT. GRADE: N80

RIG NAME: ATCO A2 CEMENT COMPANY: HALLIBURTON CEMENTER: B HOOVER

TOOL PUSHER(S): P GELINAS CO. SUPERVISOR: J OZOLINS

WELL DEPTH: 1869 (M) BIT SIZE: 12 1/4" (INS)

LAST CASING SET AT: 314 (M), SIZE: 13 3/8 (IN) WEIGHT: 68 & 72 (LB/FT) GRADE: K55

MUD DETAILS (PRIOR TO CEMENTING)

MUD TYPE: 3% KCL/POLYMER, DENSITY (IN) 9.3 (LB/GAL), (OUT) 9.3 (LB/GAL)

VISCOSITY: 39 (SEC), PV: 13 CPS, YP: 12 LB/100 FT^2 GELS 2/5 LB/100 FT^2

CEMENT DATA:

1. SINGLE STAGE ☐ 2. TWO STAGE ☒ 3. PLUG ☐ 4. SQUEEZE ☐

INTERVAL CEMENTED:

1. LEAD FROM: 1867 M TO 1667 M TOTAL: 200 REMARKS: NEAT AROUND SHOE
   TAIL FROM: M TO M TOTAL: REMARKS:
2. LEAD FROM: 1038 M TO 284 M TOTAL: 754 REMARKS: FILLER ACROSS POROUS FMS &
   TAIL FROM: M TO M TOTAL: REMARKS: INTO SURFACE CASING

		CEMENT (CLASS)	SACKS (NO:)	YIELD (CU FT/SX)	SLURRY VOLUME (CU FT)	SLURRY DENSITY (LB/GAL)	ADDITIVES & AMOUNT DRY BLENDED
1.	LEAD	G	266	1.15	306	15.8	N/A
	TAIL						
2.	LEAD	G	659	2.90	1912	11.4	N/A
	TAIL						

		MIXWATER (TYPE)	MIXWATER (GAL/SX)	TOTAL MIXWATER (BBL)	ADDITIVES & AMOUNT PREMIXED IN WATER
1.	LEAD	1% HALAD 322 BWOC	5.0	31.7	300#(6sx) HALAD 322 (37bbls)
	TAIL				
2.	LEAD	4.3% BENTONITE BWOW	17.7	278.0	5200#(52sx)MAGCOCEL (340 bbls)
	TAIL				

VOLUMES:

	CALIPER		EXCESS		TOTAL		CALCULATED		EXCESS		TOTAL		TOTAL CEMENT	
1.	12 ½ (est)	CU FT	20	%	306	CU FT:	12½	CU FT	20	%	306	CU FT	Include 2jt shoe track	CU FT
2.	13 3/4	CU FT	50	%	1912	CU FT:		CU FT		%		CU FT		CU FT

DETAILS PRE FLUSH 1) 10bbls water ahead 2) 10 bbls water ahead

DISPLACEMENT:

	CALCULATED (BBL)	ACTUAL (BBL)	CEMENT UNIT	RIG PUMP
1.	443	443	5	438
2.	249	249	5	244

JOB SUMMARY:

NOTE:* Pumps efficiency = 96% as worked out from strokes to bump

STAGE ONE OPERATION	TIME (HR)	RATE (BPM)	PRESSURE (PSI)	STAGE TWO OPERATION	TIME (HR)	RATE (BPM)	PRESSURE (PSI)
Pumped 10bbls water(rig)				Pumped 10bbls water(rig)	1538		
Press,test lines 3000psi			3000	Load top plug	1605		
Mix &pump Stage I 15.8ppg	1237			Mix & pump Stage II	1614		
Lift cap & drop plug	1302			Release top plug	1748		
Pump 5 bbls mud (Halli)	1305			Pump 5bbls mud (Halli)	1748		
Displace 438bbl mud (Rig)	1308	10.7	300	Displace 244bbls mud(rig)	1749	10.7	600
Bump with 1500psi (Rig)	1353		1500	Bump with 1000psi (rig)	1814		
Hallib.bump with 3000psi	1355		3000	Bump with 3000psi &			
& check floats OK				close sleeve - Halli.	1815		3000

Lift cap & drop opening bomb 1400

DVcollar open 800 psi 1413 800

Circulate csg & prepare 1425
gel water

COMMENTS: Cement contaminated mud in rig tanks - estimated 20bbls light cement in bottom of tanks

BIT RECORD

OPERATOR : MINORA RESOURCES NL

RIG : ATCO A2

WELL : WINDERMERE NO.2

PERMIT : PEP 111

SPUDDED : 9 MARCH 1989

Bit No.	Size in.	Make	Type	IADC Code	Serial Number	Depth In Metres	Depth Out Metres	Metres	Hours	Cum Hrs	ROP m/hr	WOB M lbs	RPM	Max Dev	BHA	Hydraulics Jets 32nds	GPM	Press psi	Mud Props. Wt ppg	Vis Secs	WL	Condition T	B	G	Remarks
1	17-1/2	Varel	L114	1.1.4	29801	10	341	331	14.5	14.5	22.8	2-20	120	0.50		3 x 22	715	1200	9.1	46	nc	2	2	I	POH for surface casing.
Drilled out surface casing 12 March 1989 (2.5 hours)																									
2	12-1/4	Varel	L135	1.3.5	23998	341	1197	856	36.5	51.0	23.5	20-30	120	0.50		14.14.22	571	1550	9.3	44	8.8	7	5	1/8	Started drilling rough. POH for fear/hrs.
3	12-1/4	Reed	S13G	1.3.5	BB1419	1197	1744	547	41.5	92.5	13.2	35-40	120-100	1.00		14.14.22	482	1600	9.3	41	6.4	7	8	1/8	POH for torque/bounce/hrs/slow pen/Core #1.
CH1RR	8-1/2	Chrst'n	RC476	PDC	1440532	1744	1749	5	10.5	103.0	0.5	8-10	80-65	0.00	CBL		263	500	9.4	39	6.8	5% Worn		I	Same cond as run in. Core #1 recovery 78%.
4	8-1/2	Reed	HP51A	5.1.7	BT4862	1749	1777	28	3.5	106.5	8.0	30	60	0.00	S1k	11.12.12	367	1600	9.3	41	6.4	1	1	I	POH for Core #2.
RRCH1	8-1/2	Chrst'n	RC476	PDC	1440532	1777	1794	17	12.0	118.5	1.4	10	80	0.00	CBL		257	500	9.3	41	6.8	25% worn		1/16	Core #2 recovery 99%.
RR4	8-1/2	Reed	HP51A	5.1.7	BT4862	1794	1802	8	1.0	119.5	8.0	30	60	0.50	S1k	11.12.12	367	1600	9.2	42	6.6	1	1	I	POH for DST #1
RR4	8-1/2	Reed	HP51A	5.1.7	BT4862	1802	1869	67	9.0	128.5	7.4	30-40	60	1.00		11.11.11	306	1425	9.2	43	6.5	2	2	I	POH for logs
5	12-1/4	Reed	FP31G	3.1.7	NRC069	1744	1869	125	15.5	144.0	8.1	15-25	80-90	1.00		14.14.22	576	2300	9.3	39	6.8	2	2	I	Hole opening for intermediate casing
Drilled out intermediate casing 27 March 1989 (6.5 hours)																									
6	8-1/2	Reed	HP43A	4.3.7	P82514	1869	2261	392	54.0	198.0	7.3	40	70	1.50		0.10.14	288	1775	8.4	26	nc	2	2	1/16	POH for hrs & to try PDC bit
7	8-1/2	L'gyear	DP13	PDC	28509	2261	2317	56	9.0	207.0	6.2	15	80-95	1.25		6 x 9	317	1125	8.4	26	nc	5% worn		I	POH for slow ROP/High $/ft
8	8-1/2	Varel	V437	4.3.7	840900	2317	2403	86	11.5	218.5	7.5	40	70	1.25		0.10.14	300	1800	8.4	26	nc	1	1	I	POH for lost jet (Washed out O-ring & circlip)
9	8-1/2	Reed	S31G	3.1.5	BT1853	2403	2603	200	32.0	250.5	6.3	40	70	2.50		0.10.14	317	2075	8.4	26	nc	5	7	I	POH for hrs
10	8-1/2	Reed	HP43A	4.3.7	79454	2603	3005	402	60.0	310.5	6.7	40	70	2.00		0.10.13	300	2250	8.5	30	12.0	6BT	8	1/16	POH for washout (In weld between #1 & 3 cone)
RR4	8-1/2	Reed	HP51A	5.1.7	BT4862	3005	3231	226	37.0	347.5	6.1	40	75	5.00		0.10.13	300	2350	9.0	30	8.0	2	3	I	POH for DST #2 (329m & 50.5 hrs Cum for bit)
11	8-1/2	Reed	HP51A	5.1.7	BT7166	3231	3595	364	93.0	440.5	3.9	43	70	6.00		0.10.13	285	2300	9.2	34	8.0	8BT	8	LC	POH for torque/hrs and to log. Lost No.1 cone.
RR4	8-1/2	Reed	HP51A	5.1.7	BT4862	3595	3595	-	-	-	-	5-15	70-85	-		3 x 13	285	1200	9.4	34	7.8	4BT	4	1/4	Clean out trip - 10 hrs reaming
RR6	8-1/2	Reed	HP43A	4.3.7	P82514	3595	3595	-	-	-	-	5-15	65-90	-		12.13.13	347	1700	9.4	33	10.2	4BT	2	1/8	Clean out trip - 7 hrs reaming

APPENDIX J

APPENDIX J

DRILL STEM TEST REPORTS

HALLIBURTON SERVICES

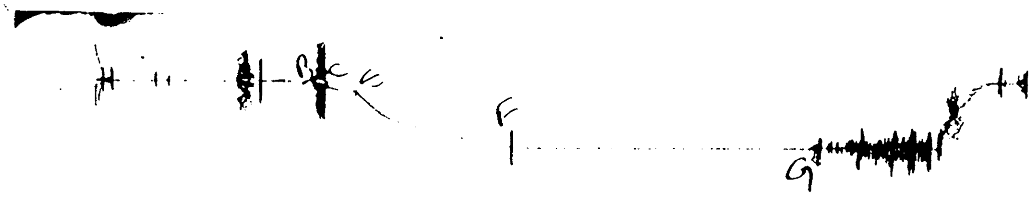
TICKET NO. 35078300

30-MAR-89

ADELAIDE

FORMATION TESTING SERVICE REPORT

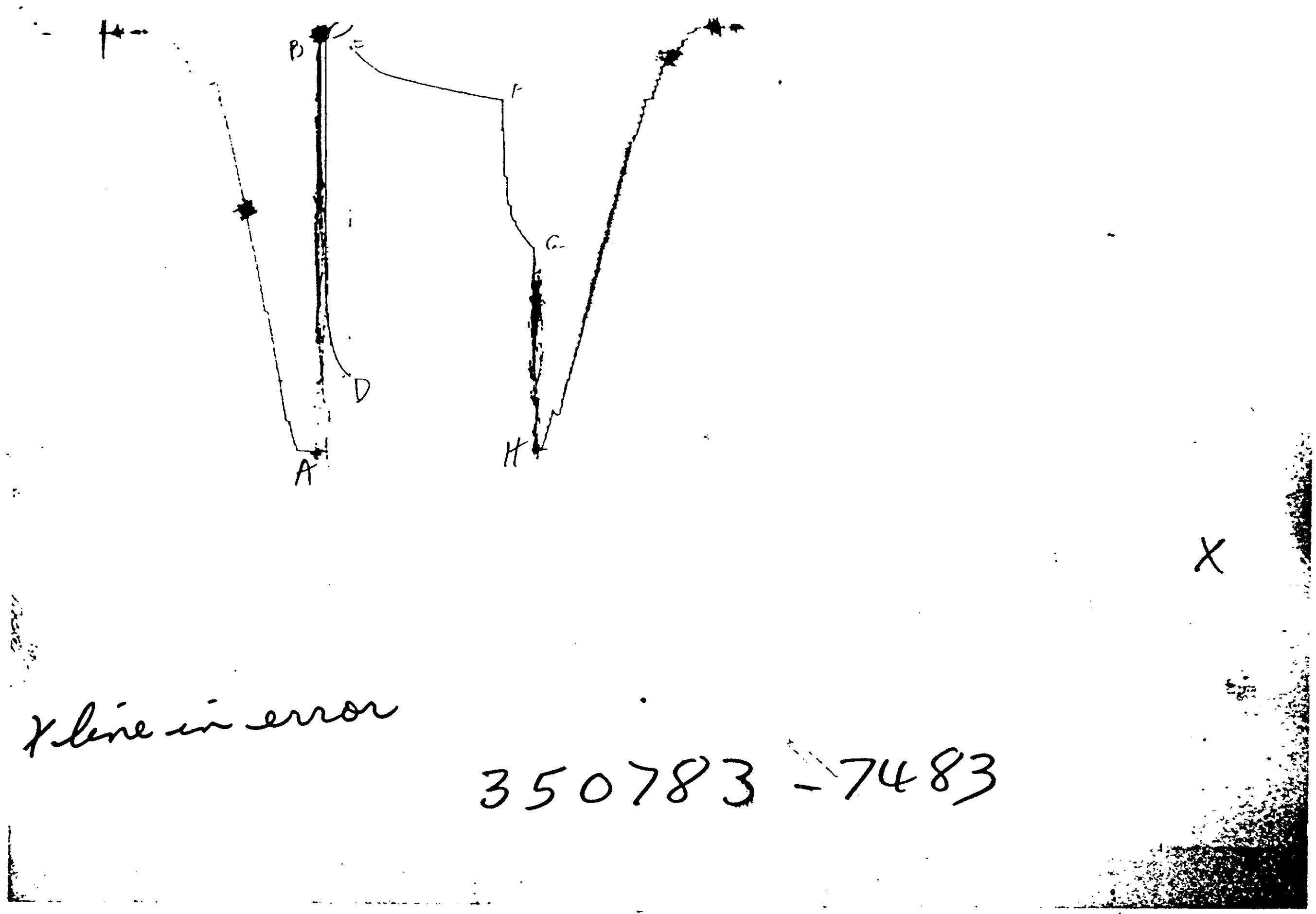
LEASE NAME	WINDERMERE
WELL NO.	2
TEST NO.	1
TESTED INTERVAL	5824.4 - 5913.0
LEASE OWNER/COMPANY NAME	MINORA RESOURCES
LEGAL LOCATION SEC. - TWP. - RNG.	SEE REMARKS
FIELD AREA	OTWAY BASIN
COUNTY	VICTORIA
STATE	AUSTRALIA DR



350783-1888

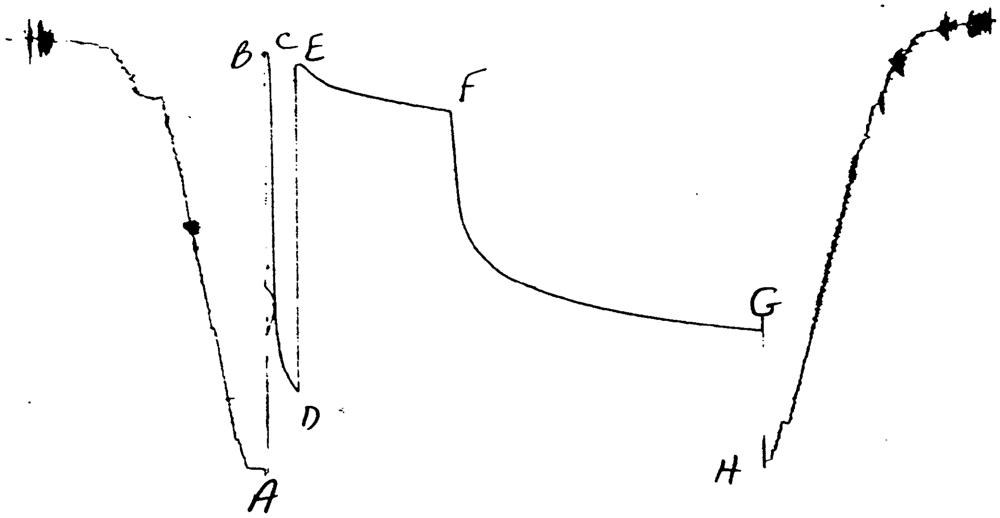
GAUGE NO: 1888 DEPTH: 5778.9 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE REPORTED	PRESSURE CALCULATED	TIME REPORTED	TIME CALCULATED	TYPE
A	INITIAL HYDROSTATIC					
B	INITIAL FIRST FLOW		12.0	5.0	4.8	F
C	FINAL FIRST FLOW		42.7			
C	INITIAL FIRST CLOSED-IN		42.7	32.0	29.0	C
D	FINAL FIRST CLOSED-IN		70.6			
E	INITIAL SECOND FLOW		70.6	180.0	182.1	F
F	FINAL SECOND FLOW	453	452.6			
F	INITIAL SECOND CLOSED-IN	453	452.6	360.0	361.1	C
G	FINAL SECOND CLOSED-IN		458.9			
H	FINAL HYDROSTATIC					



GAUGE NO: 7483 DEPTH: 5801.8 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE REPORTED	PRESSURE CALCULATED	TIME REPORTED	TIME CALCULATED	TYPE
A	INITIAL HYDROSTATIC	2756	2742.0			
B	INITIAL FIRST FLOW	48	44.3	5.0	4.8	F
C	FINAL FIRST FLOW	48	63.7			
C	INITIAL FIRST CLOSED-IN	48	63.7	32.0	29.0	C
D	FINAL FIRST CLOSED-IN	2256	2249.5			
E	INITIAL SECOND FLOW	111	86.7	180.0	182.1	F
F	FINAL SECOND FLOW	444	454.8			
F	INITIAL SECOND CLOSED-IN	444	454.8	360.0		C
G	FINAL SECOND CLOSED-IN					
H	FINAL HYDROSTATIC	2755	2737.2			



350783-8822

GAUGE NO: 8822 DEPTH: 5910.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2842	2847.0			
B	INITIAL FIRST FLOW	135	129.3	5.0	4.8	F
C	FINAL FIRST FLOW	135	137.0			
C	INITIAL FIRST CLOSED-IN	135	137.0	32.0	29.0	C
D	FINAL FIRST CLOSED-IN	2362	2365.7			
E	INITIAL SECOND FLOW	219	222.6	180.0	182.1	F
F	FINAL SECOND FLOW	538	543.9			
F	INITIAL SECOND CLOSED-IN	538	543.9	360.0	361.1	C
G	FINAL SECOND CLOSED-IN		2030.1			
H	FINAL HYDROSTATIC	2842	2854.2			

EQUIPMENT & HOLE DATA

FORMATION TESTED: HEATHFIELD

NET PAY (ft):

GROSS TESTED FOOTAGE: 88.6

ALL DEPTHS MEASURED FROM: KELLY BUSHING

CASING PERFS. (ft):

HOLE OR CASING SIZE (in): 8.500

ELEVATION (ft): 169.5

TOTAL DEPTH (ft): 5913.0

PACKER DEPTH(S) (ft): 5817, 5824

FINAL SURFACE CHOKE (in): 0.50000

BOTTOM HOLE CHOKE (in): 0.750

MUD WEIGHT (lb/gal): 9.20

MUD VISCOSITY (sec): 43

ESTIMATED HOLE TEMP. (°F):

ACTUAL HOLE TEMP. (°F): 170 @ 5909.0 ft

TICKET NUMBER: 35078300

DATE: 3-20-89 TEST NO: 1

TYPE DST: OPEN HOLE

HALLIBURTON CAMP: ADELAIDE

TESTER: B. HOOVER

WITNESS: J.E. OZOLIN

DRILLING CONTRACTOR: ATCO RIG #2

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
SAMPLE CHAMBER	0.300 @ 68 °F	14000 ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm

SAMPLER DATA

Psig AT SURFACE:

cu.ft. OF GAS:

cc OF OIL:

cc OF WATER:

cc OF MUD:

TOTAL LIQUID cc:

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): @ °F

GAS/OIL RATIO (cu.ft. per bbl):

GAS GRAVITY:

CUSHION DATA

TYPE	AMOUNT	WEIGHT

RECOVERED:

980' (10.25 BBLS.) OF MUDDY WATER

NOTE: NO NITRATES IN FLUID FROM SAMPLE CHAMBER

MEASURED FROM TESTER VALVE

REMARKS:

LEGAL LOCATION: LAT. 38 DEG. 14' 10.59" S. AND LONG. 142 DEG. 0' 17.90" E.

NOTE: THE CLOCK IN GAUGE #7483 STOPPED DURING THE FINAL CIP PERIOD AND RESTARTED WHEN PACKER WAS BYPASSED.

TYPE & SIZE MEASURING DEVICE: .5" CERAMIC CHOKE					TICKET NO: 35078300
TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
3-20-89					
0315					STARTED MAKING UP TOOL
0420					STOPPED
0435					TOOL IN HOLE
0505					MADE UP HEAD ON SINGLE
0525					LAID OUT HEAD
0713					MADE UP HEAD AND CHICKSANS
					STRING WT. 99000#
0727					SET WEIGHT ON TOOL 35.000#
0730	.5				OPENED TOOL WITH A WEAK BUBBLE
0732					CLOSED FLOOR MANIFOLD, SLIGHT
					INCREASE, WEAK BUBBLE
0735					CLOSED TOOL
0807					OPENED TOOL WITH A WEAK BUBBLE
					CLOSED FLOOR MANIFOLD
0810					WEAK BLOW
0815					WEAK BLOW
0820					WEAK TO MODERATE BOTTOM OF
					BUCKET
0824					OPENED 2" MANIFOLD VALVE TO
					FLARE LINE, BLOW DECREASING
0830					VERY WEAK BUBBLE
0831					NO BLOW
0835					CLOSED FLOOR MANIFOLD, VERY
					WEAK BUBBLE
0845					BUBBLE CONTINUE TO INCREASE
					SLOWLY TO A MODERATE BLOW,
					BOTTOM OF BUCKET
1000					MODERATE BLOW
1030					SAME
1100					SAME
1107					CLOSED TOOL
1707					PULLED FREE--OK--PICKED UP
					1000# EXTRA WEIGHT
2007					TOOL OUT OF HOLE
2020					STARTED BREAKING OUT TOOL
2135					TOOL LAID OUT

TICKET NO: 35078300	
CLOCK NO: 29491	HOUR: 24

GAUGE NO: 1888
DEPTH: 5778.9

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW						
B	1	0.0	12.0			
C	2	4.8	42.7	30.7		
FIRST CLOSED-IN						
C	1	0.0	42.7			
D	2	29.0	70.6	27.9	4.1	0.067
SECOND FLOW						
E	1	0.0	70.6			
	2	5.0	99.3	28.7		
	3	10.0	127.0	27.7		
	4	15.0	151.4	24.4		
	5	20.0	177.7	26.3		
	6	25.0	202.6	24.9		
	7	30.0	227.5	24.9		
	8	35.0	245.8	18.3		
	9	40.0	260.5	14.6		
	10	45.0	272.0	11.5		
	11	50.0	282.2	10.3		
	12	55.0	289.2	7.0		
	13	60.0	297.9	8.7		
	14	65.0	305.7	7.8		
	15	70.0	314.3	8.5		
	16	75.0	322.1	7.8		
	17	80.0	329.4	7.3		
	18	85.0	336.6	7.1		
	19	90.0	345.1	8.5		
	20	95.0	351.9	6.8		
	21	100.0	358.2	6.3		
	22	105.0	365.7	7.5		
	23	110.0	371.1	5.4		
	24	115.0	378.0	7.0		
	25	120.0	384.8	6.8		
	26	125.0	391.1	6.3		
	27	130.0	397.7	6.6		
	28	135.0	404.0	6.3		
	29	140.0	409.4	5.4		
	30	145.0	414.6	5.2		
	31	150.0	420.0	5.4		
	32	155.0	424.7	4.7		
	33	160.0	431.4	6.6		
	34	165.0	436.6	5.2		
	35	170.0	441.5	4.9		
	36	175.0	446.0	4.5		
F	37	182.1	452.6	6.6		

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND CLOSED-IN						
F	1	0.0	452.6			
G	2	361.1	458.9	6.3	123.2	0.181

REMARKS:

TICKET NO: 35078300	GAUGE NO: 7483
CLOCK NO: 6719 HOUR: 24	DEPTH: 5801.8

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
		FIRST FLOW				
B	1	0.0	44.3			
C	2	4.8	63.7	19.4		
		FIRST CLOSED-IN				
C	1	0.0	63.7			
	2	1.0	1958.3	1894.7	0.8	0.768
	3	2.0	1987.9	1924.2	1.4	0.525
	4	3.0	2011.1	1947.5	1.8	0.419
	5	4.0	2040.3	1976.7	2.2	0.342
	6	5.0	2060.3	1996.7	2.5	0.291
	7	6.0	2079.5	2015.9	2.7	0.255
	8	7.0	2093.2	2029.5	2.8	0.227
	9	8.0	2103.2	2039.5	3.0	0.204
	10	9.0	2114.9	2051.3	3.1	0.186
	11	10.0	2129.8	2066.2	3.2	0.170
	12	12.0	2152.4	2088.7	3.4	0.146
	13	14.0	2169.8	2106.2	3.6	0.128
	14	16.0	2182.9	2119.2	3.7	0.114
	15	18.0	2198.3	2134.6	3.8	0.103
	16	20.0	2211.4	2147.8	3.9	0.093
	17	22.0	2223.5	2159.8	3.9	0.086
	18	24.0	2233.5	2169.8	4.0	0.079
	19	26.0	2242.2	2178.6	4.0	0.074
D	20	29.0	2249.5	2185.9	4.1	0.067
		SECOND FLOW				
E	1	0.0	86.7			
	2	5.0	98.6	11.9		
	3	10.0	127.0	28.4		
	4	15.0	158.7	31.7		
	5	20.0	188.4	29.7		
	6	25.0	210.6	22.2		
	7	30.0	231.4	20.8		
	8	35.0	251.0	19.5		
	9	40.0	266.8	15.9		
	10	45.0	279.4	12.5		
	11	50.0	288.1	8.7		
	12	55.0	296.8	8.7		
	13	60.0	303.7	6.8		
	14	65.0	312.9	9.2		
	15	70.0	319.7	6.8		
	16	75.0	327.6	7.9		
	17	80.0	335.7	8.1		
	18	85.0	342.2	6.5		
	19	90.0	349.8	7.6		
	20	95.0	357.1	7.3		
	21	100.0	362.7	5.6		

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
		SECOND FLOW - CONTINUED				
	22	105.0	370.5	7.8		
	23	110.0	377.3	6.8		
	24	115.0	381.6	4.3		
	25	120.0	388.9	7.3		
	26	125.0	396.5	7.6		
	27	130.0	401.0	4.4		
	28	135.0	407.8	6.8		
	29	140.0	412.7	4.9		
	30	145.0	418.3	5.6		
	31	150.0	425.2	7.0		
	32	155.0	429.4	4.1		
	33	160.0	434.0	4.6		
	34	165.0	439.2	5.2		
	35	170.0	444.1	4.9		
	36	175.0	449.2	5.1		
F	37	182.1	454.8	5.6		
		SECOND CLOSED-IN				
F	1	0.0	454.8			
[1]	2	1.0	656.7	201.9	1.0	2.257
[1]	3	5.0	960.2	505.4	4.9	1.585
[1]	4	8.8	1148.1	693.3	8.4	1.346
[1]	5	14.7	1250.6	795.9	13.7	1.136
[1]	6	19.7	1312.5	857.7	17.8	1.020
[2]	7	35.7	1428.0	973.2	30.0	0.795
G	8	NO DATA FOR THIS POINT				

LEGEND:
[1] STAIR-STEP [2] CLOCK STOPPED

REMARKS:

TICKET NO: 35078300	GAUGE NO: 8822
CLOCK NO: 32068 HOUR: 24	DEPTH: 5910.0

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
		FIRST FLOW				
B	1	0.0	129.3			
	2	1.0	128.6	-0.7		
	3	2.0	129.1	0.5		
	4	3.0	131.0	1.9		
	5	4.0	135.7	4.7		
C	6	4.8	137.0	1.3		
		FIRST CLOSED-IN				
C	1	0.0	137.0			
	2	1.0	202.7	65.7	0.8	0.763
	3	2.0	362.1	225.1	1.4	0.535
	4	3.0	1707.7	1570.7	1.8	0.414
	5	4.0	1932.1	1795.1	2.2	0.342
	6	5.0	1988.7	1851.7	2.4	0.293
	7	6.0	2046.0	1909.0	2.7	0.257
	8	7.0	2082.7	1945.7	2.8	0.227
	9	8.0	2118.9	1981.9	3.0	0.204
	10	9.0	2149.5	2012.5	3.1	0.185
	11	10.0	2167.5	2030.4	3.2	0.170
	12	12.0	2208.0	2071.0	3.4	0.146
	13	14.0	2232.9	2095.8	3.6	0.128
	14	16.0	2258.2	2121.1	3.7	0.114
	15	18.0	2283.5	2146.5	3.8	0.103
	16	20.0	2300.8	2163.8	3.9	0.093
	17	22.0	2320.0	2183.0	3.9	0.086
	18	24.0	2337.0	2200.0	4.0	0.079
	19	26.0	2351.3	2214.2	4.0	0.074
D	20	29.0	2365.7	2228.7	4.1	0.067
		SECOND FLOW				
E	1	0.0	222.6			
	2	5.0	216.7	-5.9		
	3	10.0	218.9	2.2		
	4	15.0	241.1	22.2		
	5	20.0	271.2	30.1		
	6	25.0	296.5	25.3		
	7	30.0	314.5	18.0		
	8	35.0	333.7	19.2		
	9	40.0	352.9	19.2		
	10	45.0	365.7	12.8		
	11	50.0	378.3	12.6		
	12	55.0	384.0	5.7		
	13	60.0	392.6	8.6		
	14	65.0	401.9	9.3		
	15	70.0	411.6	9.8		
	16	75.0	419.5	7.9		
	17	80.0	427.1	7.6		
	18	85.0	433.2	6.1		

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
		SECOND FLOW - CONTINUED				
	19	90.0	440.1	6.9		
	20	95.0	446.5	6.4		
	21	100.0	453.2	6.7		
	22	105.0	460.4	7.2		
	23	110.0	466.7	6.2		
	24	115.0	470.5	3.9		
	25	120.0	477.6	7.1		
	26	125.0	482.7	5.1		
	27	130.0	486.9	4.2		
	28	135.0	494.4	7.6		
	29	140.0	500.8	6.4		
	30	145.0	504.1	3.3		
	31	150.0	510.0	5.9		
	32	155.0	513.6	3.6		
	33	160.0	521.0	7.4		
	34	165.0	526.4	5.4		
	35	170.0	530.7	4.3		
	36	175.0	536.2	5.6		
F	37	182.1	543.9	7.7		
		SECOND CLOSED-IN				
F	1	0.0	543.9			
	2	1.0	632.8	88.9	1.0	2.286
	3	2.0	696.2	152.3	2.0	1.981
	4	3.0	782.3	238.4	2.9	1.805
	5	4.0	882.5	338.5	3.9	1.681
	6	5.0	970.2	426.2	4.8	1.586
	7	6.0	1051.5	507.5	5.8	1.509
	8	7.0	1127.5	583.6	6.8	1.442
	9	8.0	1170.4	626.4	7.7	1.388
	10	9.0	1205.2	661.3	8.6	1.338
	11	10.0	1232.4	688.5	9.5	1.292
	12	12.0	1281.9	738.0	11.3	1.220
	13	14.0	1314.0	770.1	13.0	1.156
	14	16.0	1340.6	796.6	14.7	1.103
	15	18.0	1366.6	822.7	16.4	1.057
	16	20.0	1388.9	845.0	18.0	1.015
	17	22.0	1407.5	863.6	19.7	0.977
	18	24.0	1428.7	884.7	21.3	0.944
	19	26.0	1445.9	902.0	22.8	0.913
	20	28.0	1459.8	915.8	24.3	0.885
	21	30.0	1472.0	928.1	25.9	0.859
	22	35.0	1506.7	962.8	29.5	0.802
	23	40.0	1534.6	990.7	32.9	0.754
	24	45.0	1563.4	1019.5	36.2	0.712
	25	50.0	1588.4	1044.4	39.4	0.676
	26	55.1	1611.6	1067.7	42.5	0.643
	27	60.0	1630.8	1086.9	45.4	0.614
	28	70.0	1660.3	1116.4	50.9	0.565
	29	80.0	1689.8	1145.9	56.0	0.523
	30	90.0	1711.8	1167.9	60.8	0.488
	31	100.0	1739.2	1195.2	65.1	0.458

REMARKS:

TICKET NO: 35078300	
CLOCK NO: 32068 HOUR: 24	

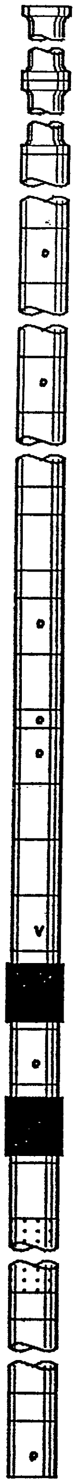
GAUGE NO: 8822
DEPTH: 5910.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
	SECOND CLOSED-IN - CONTINUED				
32	110.0	1761.5	1217.5	69.3	0.431
33	120.0	1781.1	1237.2	73.1	0.408
34	135.0	1806.9	1263.0	78.4	0.377
35	150.0	1831.3	1287.4	83.2	0.351
36	165.0	1852.8	1308.9	87.6	0.329
37	180.0	1873.3	1329.3	91.7	0.309
38	195.0	1892.3	1348.4	95.4	0.292
39	210.0	1908.5	1364.6	98.9	0.276
40	220.0	1919.8	1375.9	101.1	0.267
41	235.0	1934.8	1390.8	104.1	0.254
42	250.0	1946.4	1402.5	106.9	0.242
43	265.0	1960.7	1416.7	109.6	0.232
44	280.0	1972.5	1428.5	112.1	0.222
45	295.0	1984.8	1440.8	114.4	0.213
46	310.0	1996.2	1452.3	116.6	0.205
47	325.0	2006.1	1462.2	118.7	0.197
48	340.0	2016.3	1472.4	120.6	0.190
G 49	361.1	2030.1	1486.2	123.2	0.181

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$

REMARKS:

TICKET NO. 35078300



		O.D.	I.D.	LENGTH	DEPTH
1	DRILL PIPE......................	4.500	3.826	5171.9	
4	FLEX WEIGHT.....................	4.500	2.764	183.2	
3	DRILL COLLARS...................	6.375	2.875	339.7	
50	IMPACT REVERSING SUB............	6.000	3.000	1.0	
3	DRILL COLLARS...................	6.375	2.875	31.1	
50	IMPACT REVERSING SUB............	6.000	3.000	1.0	
3	DRILL COLLARS...................	6.375	2.875	31.1	
258	BAR CATCHER SUB	5.750	1.120	1.0	
80	AP RUNNING CASE.................	5.000	2.250	4.1	5778.9
5	CROSSOVER.......................	5.000	2.200	1.0	
12	DUAL CIP VALVE..................	5.000	0.870	4.9	
202	SAMPLE CHAMBER..................	5.000	2.500	4.9	
33	DRAIN VALVE.....................	5.000	2.200	0.9	
60	HYDROSPRING TESTER..............	5.000	0.750	5.3	
80	AP RUNNING CASE.................	5.000	2.250	4.1	5801.8
15	JAR.............................	5.000	1.750	5.0	
16	VR SAFETY JOINT.................	5.000	1.000	2.8	
70	OPEN HOLE PACKER................	6.000	1.530	5.8	5816.6
18	DISTRIBUTOR VALVE...............	5.000	1.680	2.0	
70	OPEN HOLE PACKER................	6.000	1.530	5.8	5824.4
19	ANCHOR PIPE SAFETY JOINT........	5.000	1.500	4.3	
20	FLUSH JOINT ANCHOR..............	5.000	2.370	16.0	
5	CROSSOVER.......................	6.000	3.000	1.0	
3	DRILL COLLARS...................	6.375	2.875	60.4	
5	CROSSOVER.......................	6.000	3.000	1.0	
81	BLANKED-OFF RUNNING CASE........	5.000		4.1	5910.0
	TOTAL DEPTH				5913.0

EQUIPMENT DATA

HALLIBURTON SERVICES

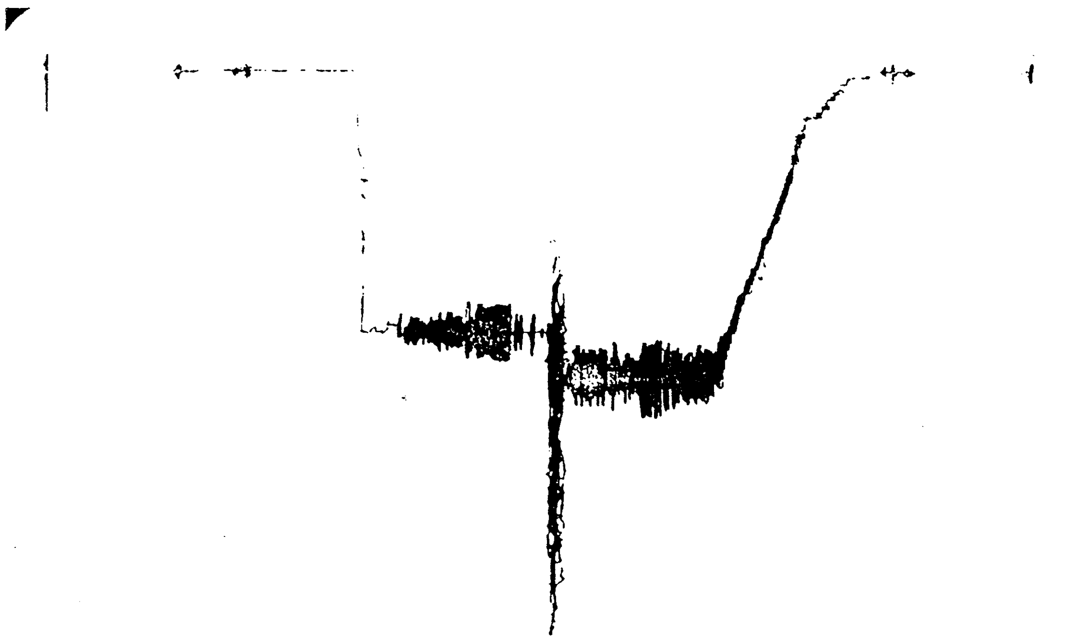
TICKET NO. 35495610

18-APR-89

MOOMBA

FORMATION TESTING SERVICE REPORT

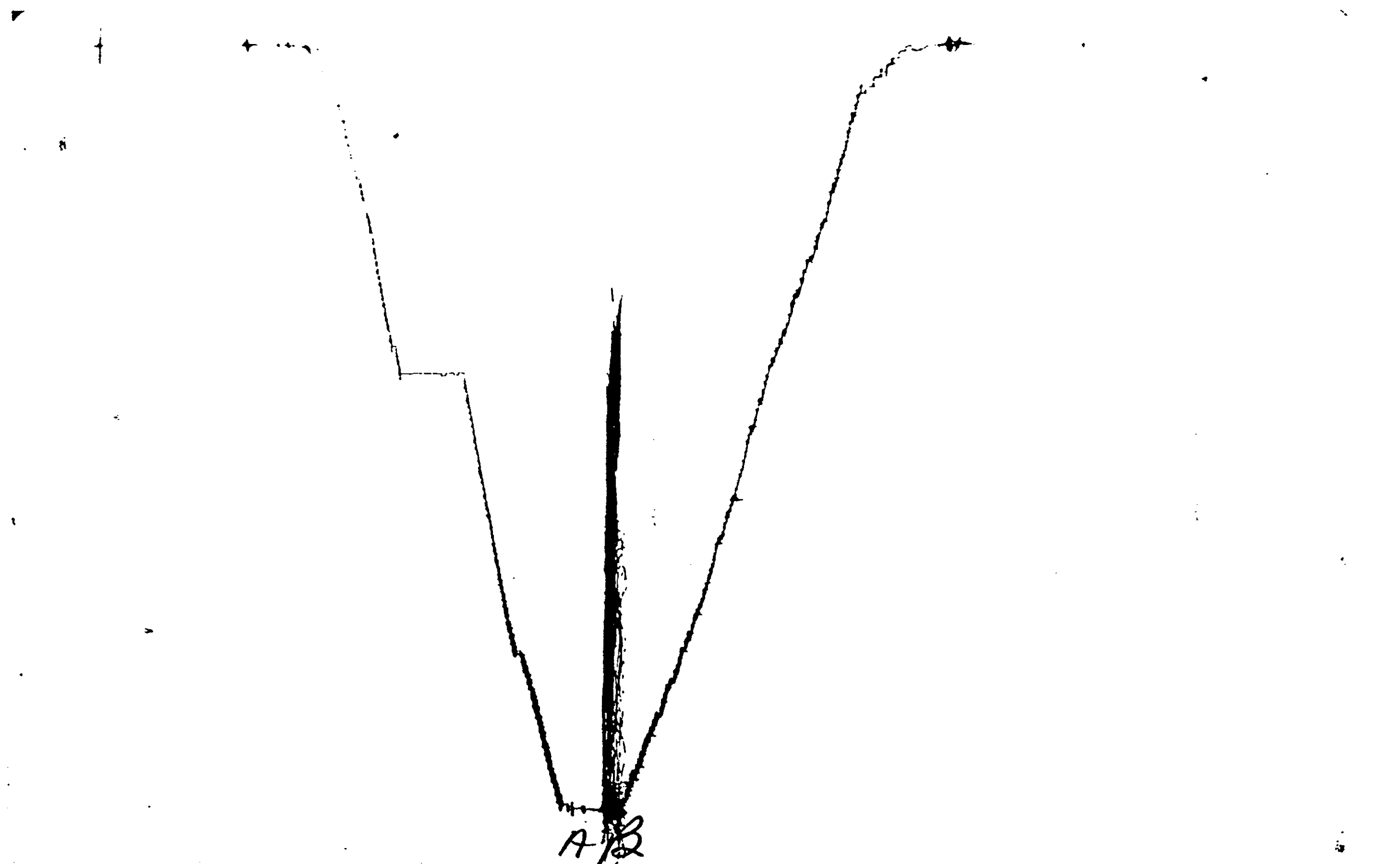
LEASE NAME	WINDAMERE
WELL NO.	2
TEST NO.	2
TESTED INTERVAL	10440.1 - 10491.9
LEASE OWNER/COMPANY NAME	MINORA RESOURCES N.L.
LEGAL LOCATION SEC. - TWP. - RNG.	SEE REMARKS
FIELD AREA	OTWAY BASIN
COUNTY	VICTORIA
STATE	AUSTRALIA DR



354956.1-8822

GAUGE NO: 8822 DEPTH: 10395.7 BLANKED OFF: NO HOUR OF CLOCK: 24

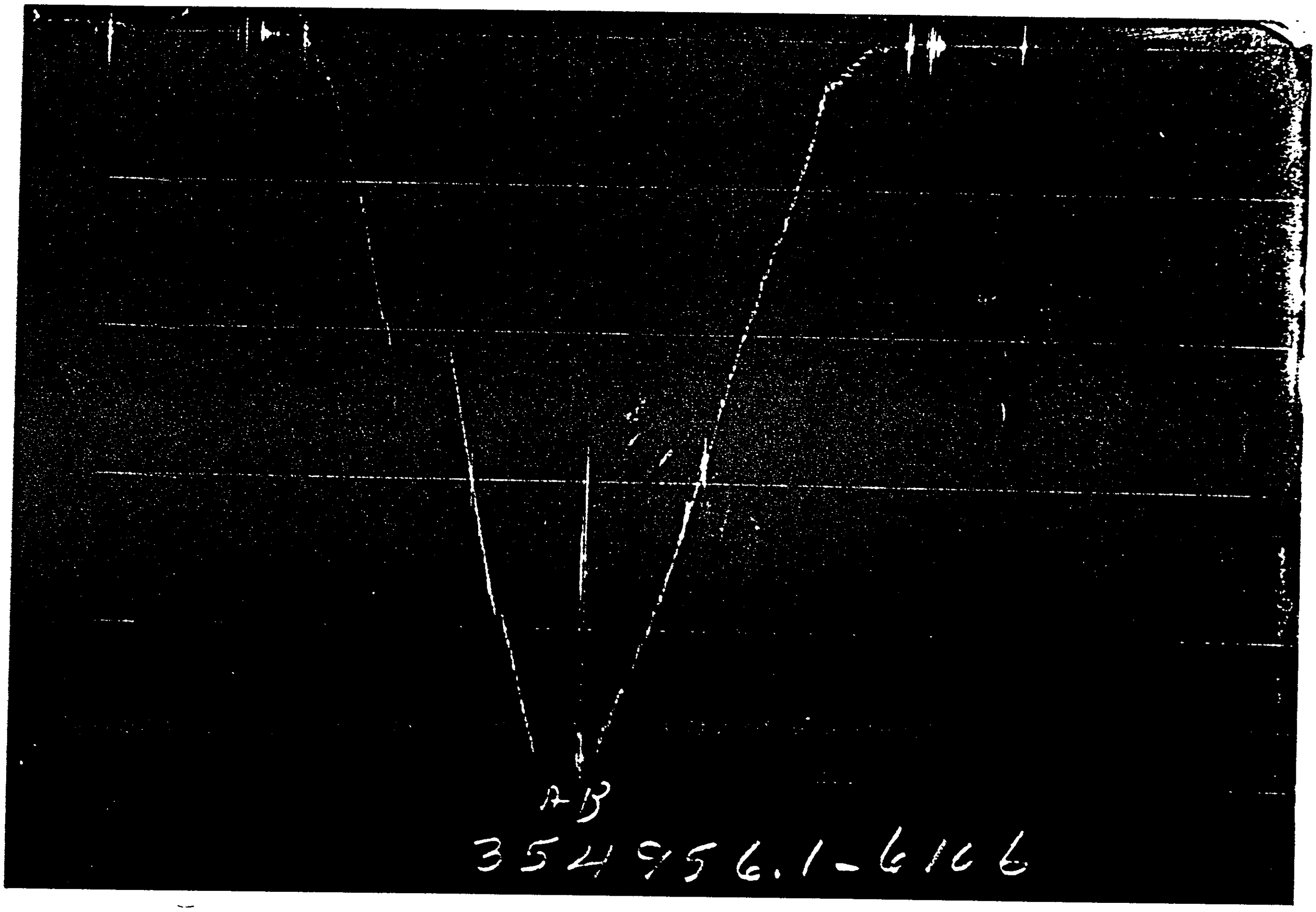
ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC					
B	FINAL HYDROSTATIC					



354956.1-7483

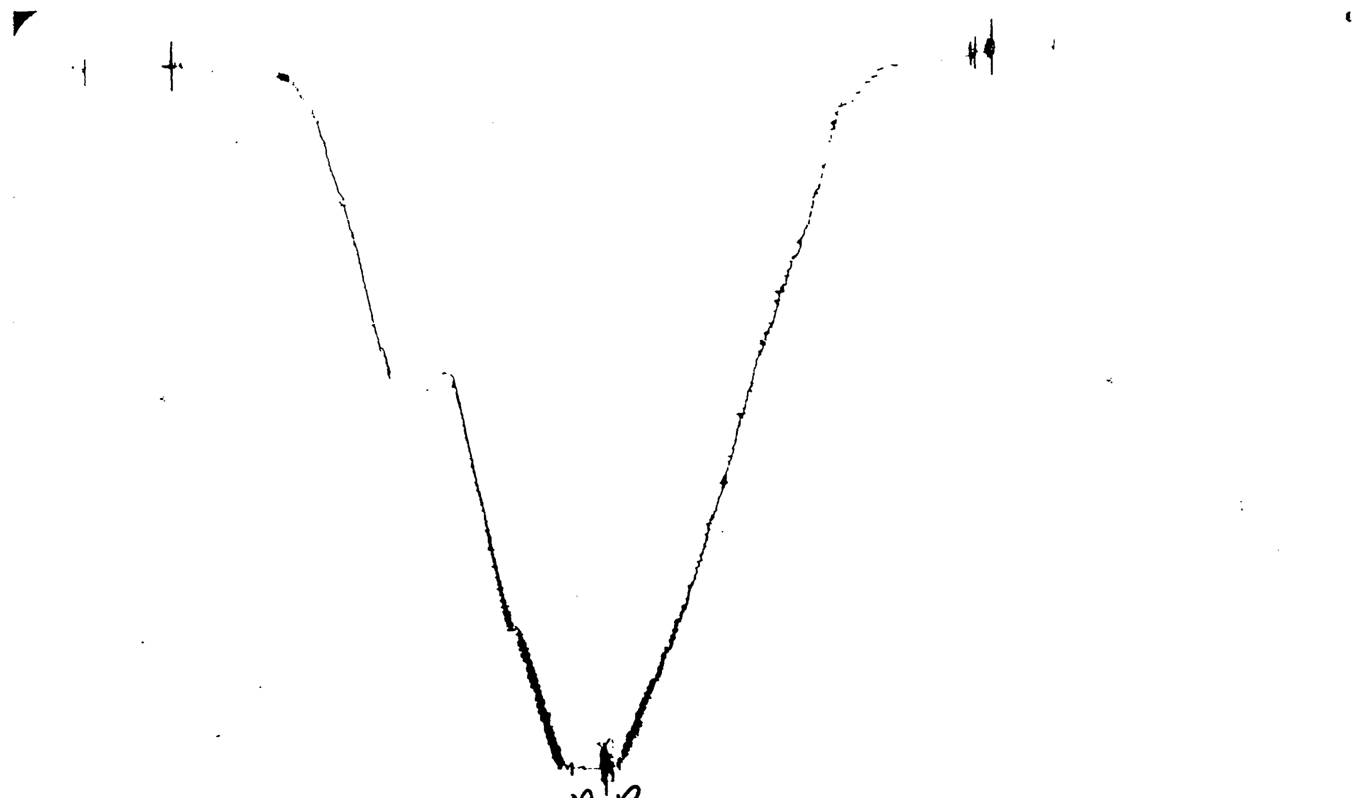
GAUGE NO: 7483 DEPTH: 10416.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	4842	4868.1			
B	FINAL HYDROSTATIC	4842	4868.1			



GAUGE NO: 6106 DEPTH: 10452.5 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	4871	4897.0			
B	FINAL HYDROSTATIC	4871	4897.0			



354956.1 – 1888

GAUGE NO: 1888 DEPTH: 10596.9 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	4894	4923.2			
B	FINAL HYDROSTATIC	4894	4923.2			

EQUIPMENT & HOLE DATA

FORMATION TESTED: LOWER EUMERALLA
NET PAY (ft): 20.2
GROSS TESTED FOOTAGE: 51.8
ALL DEPTHS MEASURED FROM: K.B. (19' AGL)
CASING PERFS. (ft):
HOLE OR CASING SIZE (in): 8.500
ELEVATION (ft): 151.4 GROUND LEVEL
TOTAL DEPTH (ft): 10599.9
PACKER DEPTH(S) (ft): 10432, 10440, 10492, 10500
FINAL SURFACE CHOKE (in): 0.75000
BOTTOM HOLE CHOKE (in): 0.750
MUD WEIGHT (lb/gal): 9.00
MUD VISCOSITY (sec): 30
ESTIMATED HOLE TEMP. (°F): 200
ACTUAL HOLE TEMP. (°F): 260 @ 10596.9 ft

TICKET NUMBER: 35495610

DATE: 4-8-89 TEST NO: 2

TYPE DST: ON BTM. STRADDLE

HALLIBURTON CAMP: MOOMBA

TESTER: IAN HOVELL

WITNESS: J.E. OZOLINS ????

DRILLING CONTRACTOR: ATCO RIG L#2

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm

SAMPLER DATA

Psig AT SURFACE:
cu.ft. OF GAS:
cc OF OIL:
cc OF WATER:
cc OF MUD:
TOTAL LIQUID cc:

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): @ °F
GAS/OIL RATIO (cu.ft. per bbl):
GAS GRAVITY:

CUSHION DATA

TYPE	AMOUNT	WEIGHT
WATER (FT.)	4340.0	8.33

RECOVERED:

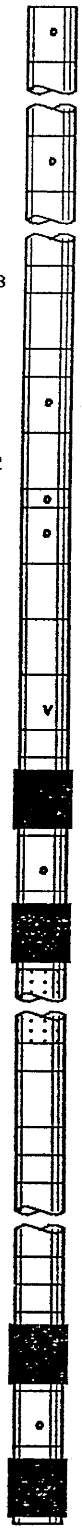
MEASURED FROM TESTER VALVE

REMARKS:

LEGAL LOCATION: 38 DEG. 14' 10.59" S. LAT., 142 DEG. 01' 17.9 E. LONG.

TYPE & SIZE MEASURING DEVICE:					TICKET NO: 35495610
TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
4-7-89					
2400					MADE UP TOOLS
4-8-89					
0215					RUN IN HOLE
0800					HEAD UP
					DOWN WT. 170,000#
					UP WT. 190,000#
					HANGING WT. 176,000#
0832					SET WT. ON TOOL 42,000#
0836	.75				OPENED TOOL
					LOST PACKER SEAT
					PULLED FREE AND HELD
0838					SET WT. ON PACKERS 50,000#
0840					OPENED TOOL--LOST SEAT. STOPPED
					MOMENTARILY. ANNULUS DROPPED
					AGAIN
0842					PULLED FREE AND PULLED OUT OF
					HOLE
1440					BROKE TOOL
1615					TOOL OUT OF HOLE
					REDRESSED TOOLS AND PREPARED
					FOR DST #2A

TICKET NO. 35495610

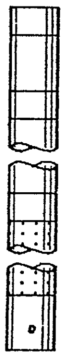


		O.D.	I.D.	LENGTH	DEPTH
51	PUMP OUT REVERSING SUB	6.000	3.000	1.0	10298.3
3	DRILL COLLARS	6.500	2.750	62.1	
50	IMPACT REVERSING SUB	6.000	3.000	1.0	10361.4
3	DRILL COLLARS	6.500	2.750	31.1	
258	BAR CATCHER SUB	6.000	1.120	1.0	
80	AP RUNNING CASE	5.000	2.250	4.1	10395.7
5	CROSSOVER	5.000	3.000	1.0	
12	DUAL CIP VALVE	5.000	0.870	4.9	
202	SAMPLE CHAMBER	5.000	2.500	4.9	
33	DRAIN VALVE	5.000	2.200	0.9	
60	HYDROSPRING TESTER	5.000	0.750	5.3	
80	AP RUNNING CASE	5.000	2.250	4.1	10416.0
15	JAR	5.000	1.750	5.0	
16	VR SAFETY JOINT	5.000	1.000	2.8	
5	CROSSOVER	5.000	0.870	1.0	
70	OPEN HOLE PACKER	7.500	2.370	5.8	10432.3
18	DISTRIBUTOR VALVE	5.000		2.0	
70	OPEN HOLE PACKER	7.500	1.530	5.8	10440.1
20	FLUSH JOINT ANCHOR	5.000	2.370	9.0	
5	CROSSOVER	5.000	2.750	1.0	
80	AP RUNNING CASE	5.000	2.250	4.1	10452.5
5	CROSSOVER	5.000	2.750	1.0	
5	CROSSOVER	6.000	3.000	1.0	
3	DRILL COLLARS	6.500	2.750	31.1	
5	CROSSOVER	6.000	3.000	1.0	
5	CROSSOVER	5.000	2.750	1.0	
70	OPEN HOLE PACKER	7.500	1.530	5.8	10491.9
18	DISTRIBUTOR VALVE	5.000	1.680	2.0	
70	OPEN HOLE PACKER	7.500	1.530	5.8	10499.7

CONTINUED

EQUIPMENT DATA

TICKET NO. 35495610



		O.D.	I.D.	LENGTH	DEPTH
5	CROSSOVER	6.000	2.750	1.0	
19	ANCHOR PIPE SAFETY JOINT	5.000	1.500	4.3	
5	CROSSOVER	6.000	3.000	1.0	
3	DRILL COLLARS	6.500	2.750	60.4	
5	CROSSOVER	6.000	3.000	1.0	
20	FLUSH JOINT ANCHOR	5.000	2.370	24.0	
81	BLANKED-OFF RUNNING CASE	5.000		4.1	10596.9
	TOTAL DEPTH				10599.9

EQUIPMENT DATA

HALLIBURTON SERVICES

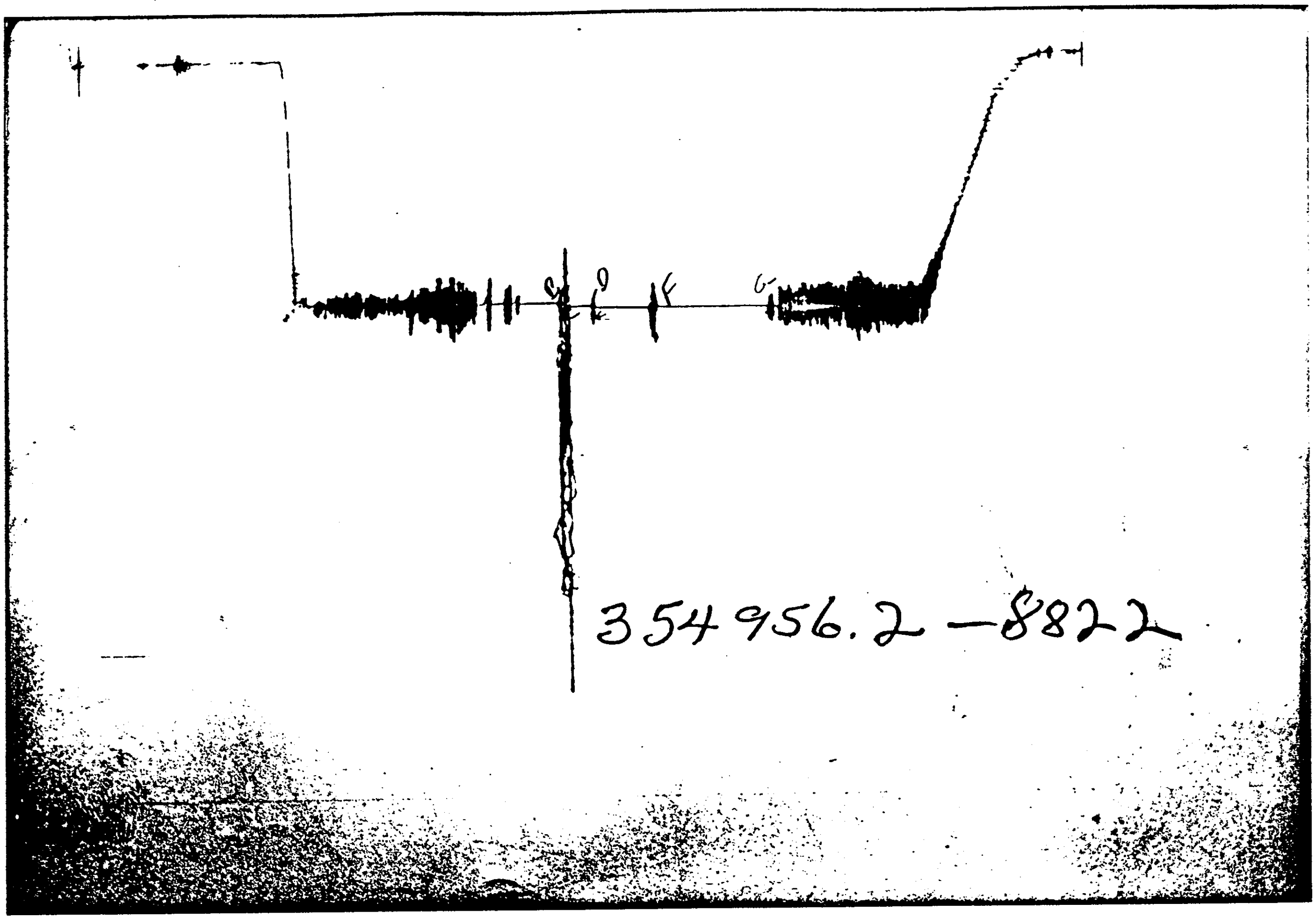
TICKET NO. 35495620

18-APR-89

MOOMBA

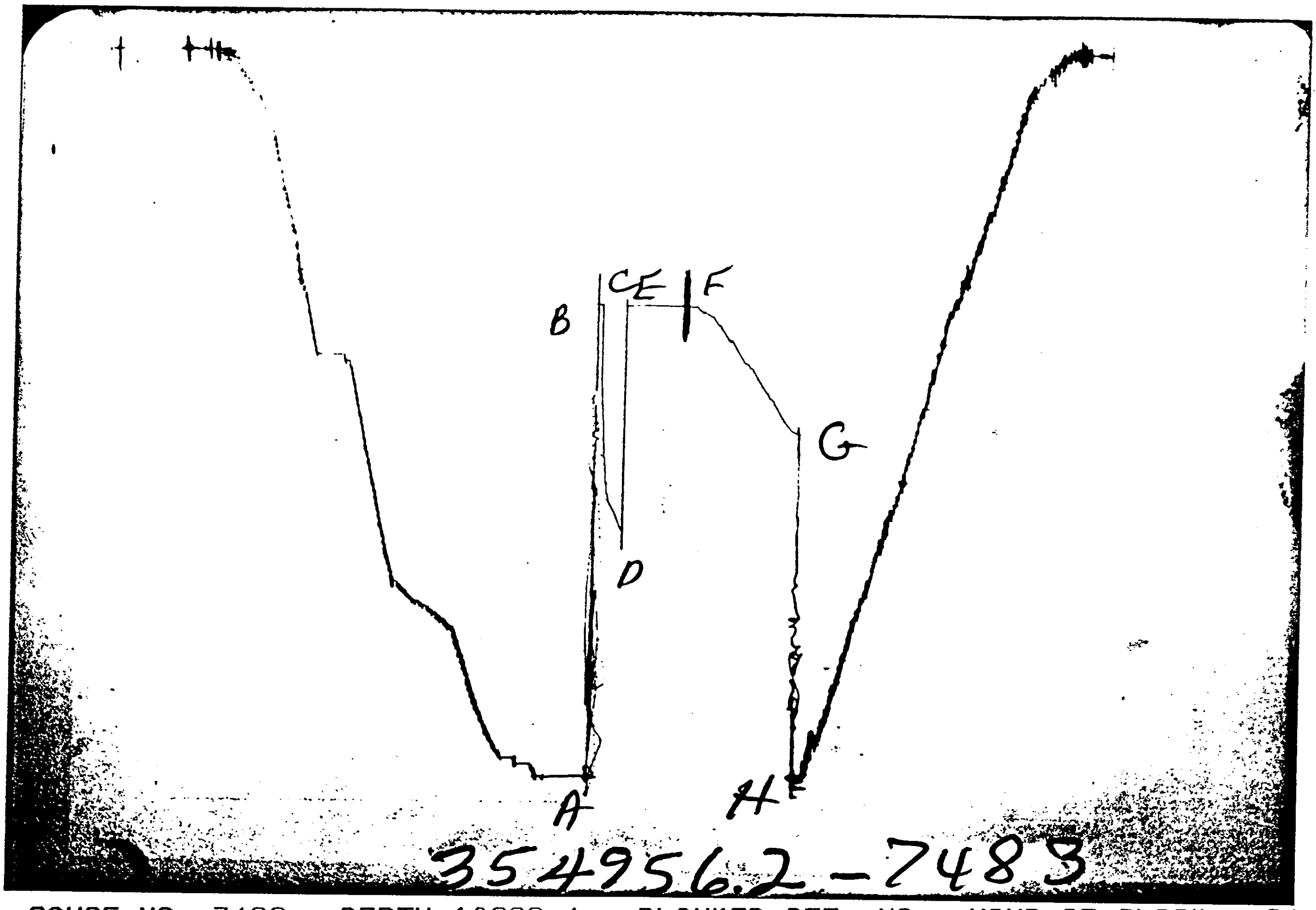
FORMATION TESTING SERVICE REPORT

LEASE NAME	WINDAMERE
WELL NO.	2
TEST NO.	2-A
TESTED INTERVAL	10413.8 - 10599.9
LEASE OWNER/COMPANY NAME	MINOR RESOURCES N.L.
LEGAL LOCATION SEC. - TWP. - RNG.	SEE REMARKS
FIELD AREA	OTWAY BASIN
COUNTY	VICTORIA
STATE	AUSTRALIA DR



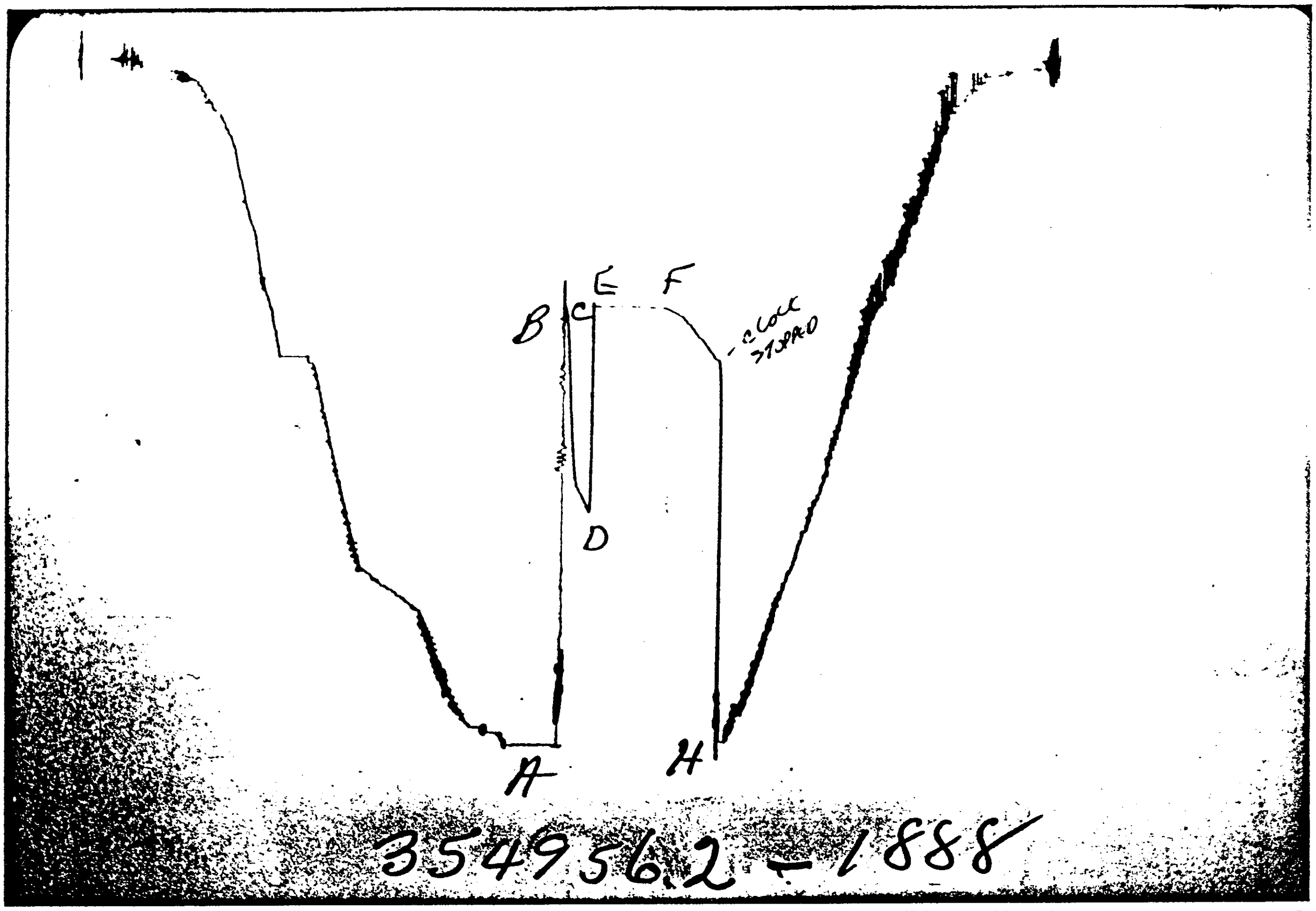
GAUGE NO: 8822 DEPTH: 10361.3 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC					
B	INITIAL FIRST FLOW		1675.4	6.0	6.3	F
C	FINAL FIRST FLOW	1662	1787.7			
C	INITIAL FIRST CLOSED-IN	1662	1787.7	30.0	27.3	C
D	FINAL FIRST CLOSED-IN		1698.5			
E	INITIAL SECOND FLOW		1698.5	71.0	71.0	F
F	FINAL SECOND FLOW	1692	1712.6			
F	INITIAL SECOND CLOSED-IN	1692	1712.6	142.0	144.4	C
G	FINAL SECOND CLOSED-IN		1712.6			
H	FINAL HYDROSTATIC					



GAUGE NO: 7483 DEPTH: 10382.4 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE REPORTED	PRESSURE CALCULATED	TIME REPORTED	TIME CALCULATED	TYPE
A	INITIAL HYDROSTATIC	4808	4824.5			
B	INITIAL FIRST FLOW	1682	1684.0	6.0	6.3	F
C	FINAL FIRST FLOW	1682	1684.0			
C	INITIAL FIRST CLOSED-IN	1682	1684.0	30.0	27.3	C
D	FINAL FIRST CLOSED-IN	3179	3196.0			
E	INITIAL SECOND FLOW	1682	1693.8	71.0	71.0	F
F	FINAL SECOND FLOW	1685	1690.3			
F	INITIAL SECOND CLOSED-IN	1685	1690.3	142.0	144.4	C
G	FINAL SECOND CLOSED-IN	2522	2549.1			
H	FINAL HYDROSTATIC	4808	4818.8			



GAUGE NO: 1888 DEPTH: 10596.9 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE REPORTED	PRESSURE CALCULATED	TIME REPORTED	TIME CALCULATED	TYPE
A	INITIAL HYDROSTATIC	4867	4903.2			
B	INITIAL FIRST FLOW	1772	1782.6	6.0	6.3	F
C	FINAL FIRST FLOW	1807	1855.7			
C	INITIAL FIRST CLOSED-IN	1807	1855.7	30.0	27.3	C
D	FINAL FIRST CLOSED-IN	3223	3261.1			
E	INITIAL SECOND FLOW	1769	1783.9	71.0	71.0	F
F	FINAL SECOND FLOW	1776	1793.9			
F	INITIAL SECOND CLOSED-IN	1776	1793.9	142.0		C
G	FINAL SECOND CLOSED-IN	2155				
H	FINAL HYDROSTATIC	4860	4883.7			

EQUIPMENT & HOLE DATA

FORMATION TESTED: LOWER EUMERALLA
NET PAY (ft): 20.2 (10459.3-10479.5)
GROSS TESTED FOOTAGE: 186.2
ALL DEPTHS MEASURED FROM: K.B. (19' AGL)
CASING PERFS. (ft):
HOLE OR CASING SIZE (in): 8.500
ELEVATION (ft): 151.4 GROUND LEVEL
TOTAL DEPTH (ft): 10599.9
PACKER DEPTH(S) (ft): 10398, 10406, 10414
FINAL SURFACE CHOKE (in): 0.75000
BOTTOM HOLE CHOKE (in): 0.750
MUD WEIGHT (lb/gal): 9.00
MUD VISCOSITY (sec): 30
ESTIMATED HOLE TEMP. (°F): 260
ACTUAL HOLE TEMP. (°F): 275 @ 10596.9 ft

TICKET NUMBER: 35495620
DATE: 4-9-89 TEST NO: 2-A
TYPE DST: OPEN HOLE
HALLIBURTON CAMP: MOOMBA
TESTER: IAN HOVELL
WITNESS: J.E. OZOLINS ?????
DRILLING CONTRACTOR: ATCO RIG #2

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm

SAMPLER DATA

Psig AT SURFACE:
cu.ft. OF GAS:
cc OF OIL:
cc OF WATER:
cc OF MUD:
TOTAL LIQUID cc:

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): @ °F
GAS/OIL RATIO (cu.ft. per bbl):
GAS GRAVITY:

CUSHION DATA

TYPE	AMOUNT	WEIGHT
WATER (FT.)	4285.0	8.33

RECOVERED:

WATER CUSHION ONLY, SLIGHTLY GAS CUT WITH OIL TRACE.

MEASURED FROM TESTER VALVE

REMARKS:

LEGAL LOCATION: 38 DEG. 14' 10.59" S. LAT., 142 DEG. 01' 17.9" E. LONG.

TYPE & SIZE MEASURING DEVICE: ______ | TICKET NO: 35495620

TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
4-8-89					
2130					MADE UP TOOLS
2245					RUN IN HOLE
4-9-89					
0600					HEAD UP
					HANGING WT. 187,000#
					UP WT. 190,000#
					DOWN WT. 180,000#
0645					SET WT. ON TOOL-48,000#
0651	.75				OPENED TOOL
0657					CLOSED TOOL
0727					OPENED TOOL
0834					ROTATED TO CLOSE TOOL
0838					CLOSED TOOL
1100					PULLED FREE AND HELD
					LET PACKERS DECOMPRESS
					PULLED OUT OF HOLE
1620					BROKE DOWN TOOL
1745					LAID OUT TOOL
					CHARTS READ AND EVALUATED
					CLOCK IN BT #1888 STOPPED
					AFTER 57 MINUTES OF FINAL CIP
					BOTH BT AND CLOCK IS TO BE
					REPLACED.

TICKET NO: 35495620
CLOCK NO: 29491 HOUR: 24

GAUGE NO: 8822
DEPTH: 10361.3

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
			FIRST FLOW			
B	1	0.0	1675.4			
C	2	6.3	1787.7	112.3		
			FIRST CLOSED-IN			
C	1	0.0	1787.7			
D	2	27.3	1698.5	-89.2	5.1	0.091
			SECOND FLOW			
E	1	0.0	1698.5			
	2	10.0	1709.7	11.1		
	3	20.0	1709.7	0.0		
	4	30.0	1709.7	0.0		
	5	40.1	1709.7	0.0		
	6	50.0	1709.7	0.0		
	7	60.0	1711.5	1.8		
F	8	71.0	1712.6	1.1		
			SECOND CLOSED-IN			
F	1	0.0	1712.6			
G	2	144.4	1712.6	0.0	50.4	0.186

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$

REMARKS:

TICKET NO: 35495620	
CLOCK NO: 7273	HOUR: 24

GAUGE NO: 7483
DEPTH: 10382.4

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
			FIRST FLOW			
B	1	0.0	1684.0			
C	2	6.3	1684.0	0.0		
			FIRST CLOSED-IN			
C	1	0.0	1684.0			
	2	2.0	2614.5	930.5	1.5	0.620
	3	4.0	2771.3	1087.3	2.4	0.414
	4	6.0	2877.6	1193.6	3.1	0.313
	5	8.0	2995.3	1311.2	3.5	0.253
	6	10.0	3020.5	1336.5	3.9	0.213
	7	12.0	3039.0	1355.0	4.1	0.184
	8	14.0	3061.7	1377.7	4.4	0.162
	9	16.0	3078.9	1394.9	4.5	0.145
	10	18.0	3107.3	1423.3	4.7	0.131
	11	20.0	3134.9	1450.9	4.8	0.119
	12	22.0	3162.7	1478.7	4.9	0.110
	13	24.0	3189.8	1505.8	5.0	0.102
D	14	27.3	3196.0	1512.0	5.1	0.091
			SECOND FLOW			
E	1	0.0	1693.8			
	2	10.0	1692.5	-1.3		
	3	20.0	1690.1	-2.4		
	4	30.0	1688.7	-1.4		
	5	40.0	1688.7	0.0		
	6	50.0	1691.2	2.6		
	7	60.0	1691.2	0.0		
F	8	71.0	1690.3	-1.0		
			SECOND CLOSED-IN			
F	1	0.0	1690.3			
	2	10.0	1696.8	6.5	8.9	0.940
	3	20.0	1720.6	30.4	15.9	0.687
	4	30.0	1751.1	60.9	21.6	0.554
	5	40.0	1802.6	112.3	26.3	0.467
	6	50.0	1871.7	181.5	30.4	0.406
	7	60.0	1926.7	236.4	33.8	0.360
	8	70.0	2021.1	330.9	36.7	0.323
	9	80.0	2086.8	396.6	39.3	0.294
	10	90.0	2157.0	466.7	41.6	0.269
	11	100.0	2247.0	556.7	43.6	0.249
	12	110.0	2320.2	629.9	45.4	0.231
	13	120.0	2416.3	726.1	47.0	0.216
	14	130.0	2500.8	810.5	48.5	0.203
	15	140.0	2545.1	854.9	49.8	0.191
G	16	144.4	2549.1	858.8	50.3	0.186

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$

REMARKS:

TICKET NO: 35495620	
CLOCK NO: 6719	HOUR: 24

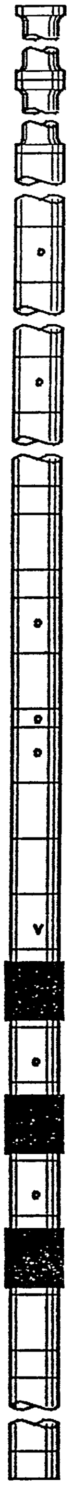
GAUGE NO: 1888
DEPTH: 10596.9

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
		FIRST FLOW				
B	1	0.0	1782.6			
	2	1.0	1785.6	3.0		
	3	2.0	1789.1	3.5		
	4	3.0	1794.3	5.2		
	5	4.0	1817.5	23.3		
	6	5.0	1839.6	22.0		
C	7	6.3	1855.7	16.1		
		FIRST CLOSED-IN				
C	1	0.0	1855.7			
	2	2.0	2263.4	407.7	1.5	0.621
	3	4.0	2531.8	676.1	2.4	0.413
	4	6.0	2764.6	908.8	3.1	0.313
	5	8.0	2944.9	1089.1	3.5	0.253
	6	10.0	3049.5	1193.8	3.9	0.213
	7	12.0	3086.3	1230.6	4.1	0.184
	8	14.0	3105.3	1249.6	4.4	0.162
	9	16.0	3127.6	1271.8	4.5	0.145
	10	18.0	3147.6	1291.9	4.7	0.131
	11	20.0	3176.2	1320.5	4.8	0.119
	12	22.0	3198.5	1342.7	4.9	0.110
	13	24.0	3231.0	1375.3	5.0	0.102
D	14	27.3	3261.1	1405.4	5.1	0.091
		SECOND FLOW				
E	1	0.0	1783.9			
	2	10.0	1786.5	2.6		
	3	20.0	1784.2	-2.3		
	4	30.0	1783.2	-1.0		
	5	40.0	1784.5	1.4		
	6	50.0	1787.5	3.0		
	7	60.0	1791.7	4.2		
F	8	71.0	1793.9	2.3		
		SECOND CLOSED-IN				
F	1	0.0	1793.9			
	2	10.0	1826.2	32.3	8.9	0.940
	3	20.0	1878.3	84.4	15.9	0.687
	4	30.0	1960.1	166.1	21.6	0.553
	5	40.0	2042.0	248.1	26.4	0.467
	6	50.0	2136.8	342.8	30.4	0.406
$\boxed{1}$	7	57.0	2172.5	378.6	32.8	0.372
G	8	NO DATA FOR THIS POINT				

LEGEND:
$\boxed{1}$ CLOCK STOPPED

REMARKS:

TICKET NO. 35495620

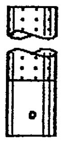


		O.D.	I.D.	LENGTH	DEPTH
1	DRILL PIPE	5.500		9740.0	
1	DRILL PIPE	5.500		183.2	
3	DRILL COLLARS	6.500	2.750	340.7	
51	PUMP OUT REVERSING SUB	6.000	3.000	1.0	10263.9
3	DRILL COLLARS	6.500	2.750	62.2	
50	IMPACT REVERSING SUB	6.000	3.000	1.0	10327.1
3	DRILL COLLARS	6.500	2.750	31.1	
258	BAR CATCHER SUB	6.000	1.120	1.0	
80	AP RUNNING CASE	5.000	2.250	4.1	10361.3
5	CROSSOVER	5.000	3.000	1.0	
12	DUAL CIP VALVE	5.000	0.870	4.9	
202	SAMPLE CHAMBER	5.000	2.500	4.9	
33	DRAIN VALVE	5.000	2.200	0.9	
60	HYDROSPRING TESTER	5.000	0.750	5.3	10380.2
80	AP RUNNING CASE	5.000	2.250	4.1	10382.4
15	JAR	5.000	1.750	5.0	
16	VR SAFETY JOINT	5.000	1.000	2.8	
70	OPEN HOLE PACKER	7.500	1.530	5.8	10398.1
18	DISTRIBUTOR VALVE	5.000	1.680	2.0	
70	OPEN HOLE PACKER	7.500	1.530	5.8	10406.0
18	DISTRIBUTOR VALVE	5.000	1.680	2.0	
70	OPEN HOLE PACKER	7.500	1.530	5.8	10413.8
19	ANCHOR PIPE SAFETY JOINT	5.000	1.500	4.3	
5	CROSSOVER	6.000	3.000	1.0	
3	DRILL COLLARS	6.500	2.750	122.5	
5	CROSSOVER	6.000	3.000	1.0	

CONTINUED

EQUIPMENT DATA

TICKET NO. 35495620



		O.D.	I.D.	LENGTH	DEPTH
20	FLUSH JOINT ANCHOR..............	5.000	2.370	52.0	
81	BLANKED-OFF RUNNING CASE........	5.000		4.1	10596.9
	TOTAL DEPTH				10599.9

EQUIPMENT DATA

APPENDIX K

APPENDIX K

SOURCE ROCK ANALYSIS AND PETROLEUM GEOCHEMISTRY

SOURCE ROCK ANALYSIS AND PETROLEUM GEOCHEMISTRY,

WINDERMERE -2, PEP -111

OTWAY BASIN

MINORA RESOURCES NL

F3/0/0 - F 7565/89

July 1989

amdel technology and enterprise

Amdel Limited
(Incorporated in S.A.)
31 Flemington Street,
Frewville, S.A. 5063

Telephone: (08) 372 2700

P.O. Box 114,
Eastwood, S.A. 5063

Telex: AA82520
Facsimile: (08) 79 6623

27th July 1989

Minora Resources NL
GPO Box D164
PERTH WA 6001

Attention: T Scholefield

REPORT F 7565/89

CLIENT REFERENCE:	Fax message from T Scholefield, 10/4/89 and Data Transmittal from I Copp, 9/5/89
TITLE:	Source rock analysis and petroleum geochemistry, Windermere -2, PEP -111, Otway Basin
MATERIAL:	Oil (1 sample), Water (1 sample), Sidewall core (4 samples), Cuttings (13 samples).
LOCALITY:	WINDERMERE -2
IDENTIFICATION:	As in Table 1 of report
DATES RECEIVED:	12 April and 10 May, 1989
WORK REQUIRED:	Water: Water analysis (W2/1) Oil: Solvent extraction from water (R3.6a). Whole extract GC (R2.1). Liquid chromatography without deasphaltening (R3.8). GC of saturates (R3.9). Isolation and GC-MS of naphthenes (R3.13). Isolation (by TLC) and GC-MS of aromatics (R3.14). Cuttings: TOC content and Rock-Eval pyrolysis (R3.2). SWC and Selected Cuttings: Vitrinite reflectance. Organic petrology (R3.20). Pyrolysis-GC of solvent-washed cuttings (R3.19). Interpretation.

Investigation and Report by: Dr David M McKirdy and Brian L Watson

Dr Brian G Steveson
Manager, Petroleum Services Section

apk

1. INTRODUCTION

Water, oil and rock samples (sidewall cores, cuttings) from the Early Cretaceous sequence in Windermere -2 were submitted for geochemical and organic petrological analysis (Table 1).

The aims of the investigation were fourfold:

1) to evaluate the hydrocarbon source potential of organic-rich sediments within the lower Eumeralla Formation and underlying Crayfish Formation at Windermere -2;

2) to determine the type, source affinity and maturity of the Windermere -2 (basal Eumeralla) oil show;

3) to compare the Windermere -2 crude with oil recovered from the Heathfield Sandstone Member in Windermere -1 (McKirdy, 1987); and

4) to characterise the chemical composition, total dissolved solids, hardness, alkalinity and resistivity/conductivity of water obtained from the Heathfield Sandstone Member during DST 1 of Windermere - 2.

Preliminary results were facsimilied to Minora Resources, Perth, in various progress reports dated 13 and 14 April, 16 and 28 June and 17 July.

2. ANALYTICAL METHODS

The analytical procedures were essentially as described for Windermere -1 (McKirdy, 1987) except that, GC-MS analysis of naphthenes and pyrolysis-GC of solvent-washed cuttings were undertaken at Curtin University, Perth.

3. RESULTS

Analytical data are summarised and presented herein as follows:

	Table	Figure	Appendix
Source Rock Analysis			
Formation tops	-	-	-
Vitrinite reflectance	2	1	2
TOC, Rock-Eval pyrolysis	3	2	-
Organic petrology	4-6	-	3
Whole-rock pyrolysis-GC	7,8	3	-
Oil Analysis			
C_{12+} composition	9	4	-
Whole-extract GC	-	5	-
GC of saturates	9	6,7	-
GC-MS of naphthenes	10,11	8,17	4
GC-MS of aromatics	12	18,19	-
Water Analysis	-	-	5

amdel

4. SOURCE ROCK ANALYSIS

4.1 Maturity

The stratigraphy of the Windermere -2 well section is given in Appendix 1. Vitrinite reflectance (VR) data plotted in Figure 1 show that Tertiary and Cretaceous sediments above 2435 metres depth are immature (VR < 0.5%).

The onset of gas and oil generation from Type III kerogen occurs at the following depths within the lower Eumeralla Formation:

Threshold	VR %	Depth m
top of gas window	0.6	2745
top of oil window	0.7	3002

At total depth in Windermere -2 the Crayfish Formation is optimally mature for oil generation (3595 m KB, VR = 0.97%).

Rock-Eval Tmax values on selected samples of the lower Eumeralla and Crayfish Formations (Fig 2) are in broad agreement with measured vitrinite reflectance.

Production index, another maturation indicator, increases steadily from 0.02 (immature) at 1950 metres to 0.20 (mature) at 3415 metres depth (Table 3).

4.2 Source Richness

Within the lower Eumeralla Formation both total organic carbon content (TOC) and genetic potential ($S_1 + S_2$) increase towards the base of the unit (Table 3) where coaly sediments reflect deposition in a paludal environment. The source richness of this siltstone/shale/coal lithofacies association is good to very good (TOC = 3.45 - 30.6%; $S_1 + S_2$ = 8-96 kg hydrocarbons/tonne).

Shale/siltstone from the basal sandstone member of the Eumeralla Formation also has good source richness (TOC = 3.8%; $S_1 + S_2$ = 8 kg hydrocarbons/tonne), in marked contrast to the underlying Crayfish Formation (TOC < 1%; $S_1 + S_2$ < 1 kg hydrocarbons/tonne: rating = poor).

4.3 Source Quality and Kerogen Type

Rock-Eval hydrogen indices in the range HI = 218 - 280 reflect the presence in the lower Eumeralla Formation of moderate quality, oil and gas-prone, Type II-III kerogen (Fig 2). Petrographic examination of three high-graded lower Eumeralla samples reveals that their maceral assemblages are dominated by vitrinite.

Depth	V : I : E	HI	Rock Type
2805 - 2810	65 : 20 : 15	265	sh, 10-20% coal
2955 - 2960	75-80 : 10 : 10-15	233	silt/sh, 10-20% coal
3060 - 3065	65-70 : 10 : 20-25	273	coal, 30-40% sh

Sporinite is the dominant exinite in each case. A similar correlation between vitrinite content and hydrogen index was observed in coal from the lower Eumeralla Formation in Windermere -1 (McKirdy, 1987).

Source quality deteriorates downwards through the basal sandstone member of the Eumeralla Formation (HI = 182) and into the upper Crayfish Formation (HI = 85-91). Dispersed organic matter in both of these units is predominantly inertinitic (I = 85-90% : Table 4).

In order to further assess their oil-generative potential, coal-rich cuttings from 3060-3065 metres depth in Windermere -2 were analysed by pyrolysis-GC. The pyrolysate has a low gas: oil ratio (C_{1-5} : C_{5-31} ≃ 1 : 3 : Table 8) consistent with the moderately oil-prone character indicated by Rock-Eval pyrolysis. However, close inspection of the P-GC trace (Fig 3) reveals a number of features which together suggest the potential for generations of gas and condensate-type liquids only, viz.

1) a dominance of condensate-range components (C_5 - C_{14} = 55% of total pyrolysate),

2) a low proportion of C_{15+} components (21% of total pyrolysate),

3) a high abundance of aromatic compounds (eg. benzene, toluene, m + p-xylene, naphthalene, methylnaphthalenes, dimethylnaphthalenes) relative to aliphatic components, and

4) high alkane/alkene ratios in the C_{13+} range.

5. OIL GEOCHEMISTRY

5.1 General Characteristics

In view of its mode of recovery (extracted from DST 2A water sample by shaking with dichloromethane), the Windermere -2 oil cannot be compared with the Windermere -1 (DST 1) crude in terms of its physical properties (specific gravity, viscosity and pour point). Nevertheless, the two oils (C_{12+} fraction) do have similar paraffinic bulk compositions (Table 9, Fig 4) and both are moderately waxy (Fig 5; McKirdy, 1987, Fig 1).

The enhanced concentration of the C_{25} n-alkane in the Windermere -2 whole-oil chromatogram (Fig 5) is not repeated in the saturates chromatogram (Fig 6), and may be due to coelution of an aromatic compound.

5.2 Maturity and Migration

Maturation-dependent ratios based on isoprenoid alkane, sterane and triterpane biomarkers (Table 10) and triaromatic hydrocarbons (Table 12) concur in highlighting the normal maturity of the Windermere -2 crude. Its MPI-derived maturity (VR_{calc} = 0.97%) represents the maturation level of its source rock at the time of primary migration. Comparison of its VR_{calc} value with the present vitrinite reflectance of the host reservoir (VR_{meas} = 0.79%) confirms that the oil is appreciably out-of-place in terms of maturity.

The marked maturity difference between the Windermere -1 (Heathfield) and Windermere -2 (basal Eumeralla) oils, clearly evident from parameters 4, 6, 9, 10, 12, 16 and 17 (Table 10 : see also Fig 7), is consistent with the latter's origin from a second, more deeply buried source rock.

Unlike the Windermere -1 (Heathfield) crude which originated more or less in situ (McKirdy, 1987), the Windermere -2 (basal Eumeralla) oil does display some biomarker evidence of long-distance migration (parameter 6, Table 10). Another migration-sensitive parameter, the C_{29} diasterane/sterane ratio (parameter 7,

Table 10) is anomalously low, but this may simply reflect the coaly nature of its source rock.

5.3 Source Affinity

The terrestrial source affinity of the Windermere -2 oil is evident from aspects of its C_{12+} composition (Fig 17). The oil originated from higher plant remains (C_{29}/C_{27} sterane > 1.50 which were deposited in a partly oxic aquatic environment (pr/ph > 2). This primary land plant detritus was reworked (degraded) by aerobic bacteria (and ?fungi) during early diagenesis. Bacteria were the precursors of the C_{27}-C_{35} hopanes found in the oil (m/z 191, Fig 13). These hopanes (pentacyclic triterpanes), representing a primary input of bacterial lipids to the source material, in turn underwent yet further bacterial degradation to drimanes (bicyclic sesquiterpanes) prior to burial of the organic-rich sediment below the zone of microbiological activity. This accounts for the low hopane/sterane ratio and high drimane/hopane ratio of the Windermere -2 oil (Table 11).

The C_{27}-C_{29} sterane and diasterane distributions of the Windermere -2 oil are dominated by C_{29} homologues of higher plant origin (Fig 8). This is a characteristic feature of most Australian non-marine crude oils (see e.g. Vincent *et al.*, 1985; Philp and Gilbert, 1986).

The oil's diterpane distribution (Figs 15, 16) is dominated by the C_{18} - C_{20} labdanes (bicyclic) and the C_{19} - C_{20} isopimaranes (tricyclic). These diterpenoid alkanes are derived from resins of the type synthesized by Araucariacean conifers (kauri pines : Alexander *et al.*, 1988). As in the Lindon -1 (Pebble Point) and Windermere -1 (Heathfield) oils, the tetracyclic diterpanes (beyerane, phyllocladane, kaurane) are subordinate. This feature distinguishes these Otway Basin oils from the Gippsland Basin crude oils examined by Alexander *et al.*, (1988).

6. CONCLUSIONS

1. Tertiary and Cretaceous sediments above 2435 metres depth in Windermere - 2 are thermally immature (VR < 0.5%).

2. Maturation thresholds for the onset of hydrocarbon generation from resinite-poor terrestrial organic matter in the Windermere -2 Early Cretaceous sequence are located within the lower Eumeralla Formation, as follows:

	VR %	Depth m
top of gas window	0.6	2745
top of oil window	0.7	3002

   The Crayfish Formation has attained optimal maturity for oil generation at total depth in Windermere -2 (3595 m, VR = 0.97%).

3. Organic-rich sediments (TOC = 3.5 - 31%; S_1 + S_2 = 7.7 - 96 kg hydrocarbons/tonne; HI = 218-280) occur throughout the lower Eumeralla Formation. Vitrinite-rich coals at the base of this unit (2985-3080

metres depth) contain gas and condensate-prone Type II-III kerogen that is initially mature for hydrocarbon generation (VR = 0.75 - 0.80 %).

4. Cuttings from the underlying upper Crayfish Formation are organically lean (TOC < 0.9%, $S_1 + S_2$ < 1 kg hydrocarbons/tonne). Their kerogen is inertinite-rich (I = 85-90% of DOM) and dry gas-prone (HI < 100).

5. Trace amounts of paraffinic, moderately waxy oil were recovered with water during a drill-stem test (DST 2A, 3174-3230.7 m) of the basal sandstone member of the Eumeralla Formation.

6. Like the paraffinic crude from the stratigraphically higher Heathfield sandstone member in Windermere -1, this Windermere -2 oil is of terrestrial (land plant) origin. However, the two Windermere oils differ in terms of:

   1) Their maturity (VR_{calc} = 0.97%, Windermere -2 cf. 0.57%, Windermere -1), and

   2) Specific aspects of their biomarker geochemistry (notably C_{29}/C_{27} sterane, C_{30} hopane/C_{29} sterane and drimane + homodrimane/C_{30} hopane ratios),

   and therefore appear to have originated from different Cretaceous source rocks.

7. The most likely source of the Windermere -2 oil show is the superjacent coal of the lower Eumeralla Formation, with the actual source kitchen being located basinward of the Windermere -2 well locality.

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TABLE 1

SAMPLES SUBMITTED FOR GEOCHEMICAL ANALYSIS, WINDERMERE -2

Sample Type	Test	Depth m	Unit
Water	DST 1	1775.2 - 1802.3	Heathfield sst. member, Eumeralla Formation
Oil and Water	DST 2A	3174.0 - 3230.7	Basal sst. member, Eumeralla Formation
Sidewall cores	# 24	1876	Lower Eumeralla Formation
	# 19	2352	
	# 13	2697	
	# 9	3015	
Cuttings		1950 - 1955	Lower Eumeralla Formation
		2735 - 2740	
		2805 - 2810	
		2955 - 2960	
		3060 - 3065	
		3075 - 3080	
		3220 - 3225	Basal sst. member, Eumeralla Formation
		3245 - 3250	
		3335 - 3340	
		3415 - 3420	Crayfish Formation
		3505 - 3510	
		3565 - 3570	

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TABLE 2

SUMMARY OF VITRINITE REFLECTANCE MEASUREMENTS, WINDERMERE -2

Depth (m)	Mean Maximum Reflectance	Standard Deviation	Range	Number of Determinations
1876	0.34	0.06	0.26 - 0.43	6
2352	0.50	0.07	0.37 - 0.63	27
2697	0.55	0.05	0.42 - 0.73	19
2805 - 2810	0.77«(0.70)	0.07	0.61 - 0.91	33
2955 - 2960	0.78«(0.74)	0.09	0.62 - 0.94	13
3015	0.87«(0.78)	0.09	0.72 - 1.04	17
3245 - 3250	0.79	0.07	0.66 - 0.91	15
3335 - 3340	0.91	0.09	0.77 - 1.07	11
3505 - 3510	0.81*(0.89)	0.07	0.69 - 0.91	34

« Influenced by reworked vitrinite
* Influenced by carved cuttings
() Preferred Value

TABLE 3

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Rock-Eval Pyrolysis 01/01/80

Client: MINORA RESOURCES NL

Well: WINDERMERE-2

Depth (m)	T Max	S1	S2	S3	S1+S2	PI	S2/S3	PC	TOC	HI	OI
1950	429	0.18	7.54	1.58	7.72	0.02	4.77	0.64	3.45	218	45
2735	434	0.86	17.12	0.94	17.98	0.05	18.21	1.49	7.05	242	13
2805	434	1.17	22.07	0.58	23.24	0.05	38.05	1.93	8.30	265	6
2955	440	2.50	24.02	0.79	26.52	0.09	30.40	2.21	10.30	233	7
2985	440	7.43	59.54	1.48	66.97	0.11	40.22	5.58	21.20	280	6
3060	444	11.95	83.70	1.55	95.65	0.12	54.00	7.97	30.60	273	5
3075	444	11.35	83.40	1.25	94.75	0.12	66.72	7.89	30.50	273	4
3220	443	0.81	6.93	0.35	7.74	0.10	19.80	0.64	3.80	182	9
3415	444	0.17	0.68	0.47	0.85	0.20	1.44	0.07	0.74	91	63
3505	444	0.11	0.73	0.30	0.84	0.13	2.43	0.07	0.85	85	35

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TABLE 4

PERCENTAGE OF VITRINITE, INERTINITE AND EXINITE IN DISPERSED ORGANIC MATTER, WINDERMERE-2

Depth (m)	Percentage of		
	Vitrinite	Inertinite	Exinite
1876	5	95	<5
2352	5	85	10
2697	5	85 - 90	5 - 10
2805 - 2810	65	20	15
2955 - 2960	75 - 80	10	10 - 15
3015	5	90	5
3060 - 3065	65 - 70	10	20 - 25
3245 - 3050	5	90	5
3335 - 3340	5	85 - 90	5 - 10
3505 - 3510	<5	85	10
3565 - 3570	<5	85 - 90	5 - 10

TABLE 5

ORGANIC MATTER TYPE AND ABUNDANCE,

WINDERMERE-2

Depth (m)	Estimated Volume of DOM (%)	Exinites	Exinite Macerals
1876	≈0.5	Vr	lipto, spo, cut
2352	0.5-1	Ra	lipto, lama, spo, cut, res
2697	≈1	Ra	lipto, lama, bmite spo, cut, res, ?oil.
2805 - 2810	5-10	Co-Ab	spo, lipto, cut, res, lama.
2955 - 2960	5-10	Co	spo, cut, lipto, lama, bmite, res, ?oil.
3015	0.5-1	Ra-Vr	lipto, lama, spo, ?oil.
3060 - 3065	>30	Ab	spo, lipto, sub, res, lama, bmite, cut, exs
3245 - 3250	0.5-1	Ra-Vr	lipto, lama, cut.
3335 - 3340	0.5-1	Ra	bmite, lipto, cut, lama.
3505 - 3510	≈0.5	Ra	bmite, lipto.
3565 - 3570	≈0.5	Ra	bmite, lipto.

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TABLE 6

EXINITE MATERIAL ABUNDANCE AND FLUORESCENCE CHARACTERISTICS, WINDERMERE-2

Depth (m)	Exinite Macerals	Lithology/Comments
1876	lipto(Vr;mY-mO), spo(Vr;mO), cut(Tr;mO)	Siltstone.
2352	lipto(Ra;mY-mO), lama(Ra;mO-dO), spo(Ra-Vr;mO-dO), cut(Vr;mO-dO), res(Tr;mO).	Shale; some exinites are oxidised.
2697	lipto(Ra;mO-dO), lama(Ra-Vr;mO-dO), bmite(Ra-Vr;dB), spo(Ra-Vr;mO-dO), cut(Vr;mO-dO), res(Tr;mO), ?oil(Tr;iY).	Siltstone; ?oil is commonly associated with bituminite. Some exinites appear to be slightly oxidised.
2805	spo(Co-Ab;mO-dO), lipto(Sp-Co;mO-dO), cut(Ra;mO-dO), res(Ra;mY-dO), lama (Ra;mO-dO).	Chiefly shale, 10-20% coal (clarite, duroclarite); some coals contain up to 25% exinite.
2955	spo(Sp-Co;mO-dO), cut(sp-Co;mO-dO), lipto(Sp;mO-dO); ?lama(Ra;mO), bmite (Ra;dO), res(Vr;mO), sub(Vr;nofl), ?oil(Tr;iG).	Chiefly siltstone and shale, 10-20% coal (duroclarite and clarite); some coals contain up to 25% exinite. Oil generally occurs in the siltstones.
3015	lipto(Ra-Vr;mO), ?lama(Vr;mO-dB), spo(Tr;mO), ?oil(Tr;iY-iG).	Shale.
3065	spo(Ab;mO-dO), lipto(Ab;dO), sub(Co-Ab; nofl),res(Co;dO-nofl), lama(Sp;mO), bmite(Sp;dB), cut(Ra;dO-dB), exs(Ra;mO-dB).	Chiefly coal, 30-40% shale.
3245	lipto(Ra-Vr;mO), ?lama(Vr;dO), cut(Tr;dO).	Shale; some organic rich cavings contain 10-20% exinite.
3335	bmite(Ra;dO), lipto(Ra;mO), cut(Vr;dO), lama(Vr;mO).	Shale with minor coaly stringers.
3505	bmite(Ra-Sp;dO), lipto(Vr;mO-dO).	Siltstone.
3565	bmite(Ra;dO-dB), lipto(Ra;mO-dO).	Shale.

KEY TO DISPERSED ORGANIC MATTER DESCRIPTIONS

MACERAL GROUPS

V	Vitrinite
I	Inertinite
E	Exinite

EXINITE MACERALS

spo	Sporinite
cut	Cutinite
res	Resinite
sub	Suberinite
lipto	Liptodetrinite
fluor	Fluorinite
terp	Terpenite
exs	Exsudatinite
phyto	Phytoplankton
tela	Telalginite
lama	Lamalginite
bmite	Bituminite
bmen	Bitumen
thuc	Thucholite

ABUNDANCE (by vol.)

Ma	Major	>15%
Ab	Abundant	2-15%
Co	Common	1-2%
Sp	Sparse	0.5-1%
Ra	Rare	0.1-0.5%
Vr	Very Rare	≃0.1%
Tr	Trace	<0.1

FLUORESCENCE COLOUR AND INTENSITY

G	Green	i	Intense
Y	Yellow	m	Moderate
O	Orange	d	Dull
B	Brown	nofl	No Visible Fluorescence

TABLE 7

ALKANE AND ALKENE COMPONENT ANALYSIS FROM PYROLYSIS-GC

Well name: UNDISCLOSED

Date: 1989

Sample: 3065

Carbon No.	----Alkane + Alkene-----			---------Alkane---------			---------Alkene---------			Alkane/Alkene
	A	B	C	A	B	C	A	B	C	
1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	2.209	1.8489	0.0604	1.467	1.2279	0.0401	0.742	0.6211	0.0203	1.98
6	1.267	1.0605	0.0347	0.500	0.4185	0.0137	0.767	0.6420	0.0210	0.65
7	1.073	0.8981	0.0293	0.583	0.4880	0.0159	0.490	0.4101	0.0134	1.19
8	1.062	0.8889	0.0290	0.502	0.4202	0.0137	0.560	0.4687	0.0153	0.90
9	0.988	0.8270	0.0270	0.478	0.4001	0.0131	0.510	0.4269	0.0139	0.94
10	1.193	0.9985	0.0326	0.736	0.6160	0.0201	0.457	0.3825	0.0125	1.61
11	1.995	1.6698	0.0546	0.351	0.2938	0.0096	1.644	1.3760	0.0450	0.21
12	0.584	0.4888	0.0160	0.257	0.2151	0.0070	0.327	0.2737	0.0089	0.79
13	1.417	1.1860	0.0388	1.221	1.0220	0.0334	0.196	0.1641	0.0054	6.23
14	1.638	1.3710	0.0448	1.638	1.3710	0.0448	nd	nd	nd	nd
15	2.072	1.7343	0.0567	1.570	1.3141	0.0429	0.502	0.4202	0.0137	3.13
16	1.595	1.3350	0.0436	1.398	1.1701	0.0382	0.197	0.1649	0.0054	7.10
17	1.153	0.9651	0.0315	0.975	0.8161	0.0267	0.178	0.1490	0.0049	5.48
18	1.110	0.9291	0.0304	0.922	0.7717	0.0252	0.188	0.1574	0.0051	4.90
19	0.688	0.5759	0.0188	0.578	0.4838	0.0158	0.110	0.0921	0.0030	5.25
20	0.617	0.5164	0.0169	0.451	0.3775	0.0123	0.166	0.1389	0.0045	2.72
21	0.453	0.3792	0.0124	0.400	0.3348	0.0109	0.053	0.0444	0.0014	7.55
22	0.277	0.2318	0.0076	0.230	0.1925	0.0063	0.047	0.0393	0.0013	4.89
23	0.234	0.1959	0.0064	0.204	0.1707	0.0056	0.030	0.0251	0.0008	6.80
24	0.154	0.1289	0.0042	0.137	0.1147	0.0037	0.017	0.0142	0.0005	8.06
25	0.129	0.1080	0.0035	0.104	0.0870	0.0028	0.025	0.0209	0.0007	4.16
26	0.065	0.0544	0.0018	0.055	0.0460	0.0015	0.010	0.0084	0.0003	5.50
27	0.048	0.0402	0.0013	0.048	0.0402	0.0013	nd	nd	nd	nd
28	0.020	0.0167	0.0005	0.020	0.0167	0.0005	nd	nd	nd	nd
29	0.014	0.0117	0.0004	0.014	0.0117	0.0004	nd	nd	nd	nd
30	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
31	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

nd = no data
A = % of S2
B = mg/g Rock
C = (mg/g Rock)/TOC

TABLE 8

PARAMETER SUMMARY FOR PYROLYSIS GAS CHROMATOGRAPHY

Well name: UNDISCLOSED

Date: 1989

Sample: 3065

Parameter	Value A	Value B	Value C	Value D
C1-C4 abundance (all compounds)	24.18	20.239	0.661	
C5-C8 abundance (all compounds)	13.95	11.676	0.382	
C5-C8 abundance (alkanes+alkenes)	5.61	4.696	0.153	
C9-C14 abundance (all compounds)	40.95	34.275	1.120	
C9-C14 abundance (alkanes+alkenes)	7.82	6.541	0.214	
C15-C31 abundance (all compounds)	20.92	17.510	0.572	
C15-C31 abundance (alkanes+alkenes)	8.63	7.222	0.236	
C5-C31 abundance (all compounds)	75.82	63.461	2.074	
C5-C31 abundance (alkanes+alkenes)	22.06	18.460	0.603	
C5-C31 alkane abundance	14.84	12.420	0.406	
C5-C31 alkene abundance	7.22	6.040	0.197	
C5-C8 alkane/alkene				1.193
C9-C14 alkane/alkene				1.494
C15-C31 alkane/alkene				4.666
C5-C31 alkane/alkene				2.056
C1-C4 abundance/S2				0.242
C5-C31 abundance/S2				0.758
(C1-C5)/C6+ abundance				0.365
R	29.65	24.818	0.811	
PI x PC x TOC				30.35

nd = no data
A = % of S2
B = mg/g Rock
C = (mg/g Rock)/TOC
D = (no units)
R = [(C1-C4)+(Proportion alkenes x (C5-C31))]
N.B. C1-C4 and C5-C31 are for all compounds
PI = Production index
PC = Pyrolysable carbon
S2 = Rock-Eval S2 value
TOC = Total Organic Carbon

TABLE 9

COMPARATIVE OIL ANALYSES, WINDERMERE -1 & 2

Well & Test	Depth m	Formation	C_{12+} Composition					Alkane Ratios			
			N + Iso	Naph	Arom	Res	Asph	Np/Pr	Pr/Ph	Pr/n-C_{17}	Ph/n-C_{18}
Windermere -1 DST -1	1791-1858	Eumeralla (Heathfield sst mbr)	54.1	29.2	8.4	7.6	0.07	0.25	6.1	1.14	0.17
Windermere -2 DST -2A	3174-3230.7	Eumeralla (basal sst mbr)	48.9	30.7	15.9	--	4.5 --	0.33	5.7	0.86	0.14

* Data from McKirdy (1987)

TABLE 10

BIOMARKER PARAMETERS OF SOURCE, MATURITY, MIGRATION AND BIODEGRADATION IN OILS FROM WINDERMERE -1 & 2

Well & Formation	Test & Depth (m)	Steranes							Terpanes						Acyclic Alkanes			
Parameter*		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Windermere -1 Eumeralla (Heathfield sst member)**	DST 1 1791-1838	-	6.8	11.1	0.82	1.1	0.90	0.57	0.08	3.7	0.05	1.4	0.17	0.04	6.1	0.43	1.1	0.17
Windermere -2 Eumeralla (basal sst member)	DST 2A 3174-3230.7	-	3.7	4.6	0.97	1.3	1.4	0.49	0.25	1.2	0.24	1.4	0.08	-	5.7	0.55	0.86	0.14

* See key (next page) for derivation and specificity of each parameter

** Data from McKirdy (1987)

KEY TO BIOMARKER PARAMETERS OF SOURCE, MATURITY, MIGRATION AND BIODEGRADATION

Parameter	* Derivation	Specificity
1	C_{27} : C_{28} : C_{29} 5α(H)14α(H)17α(H) 20R steranes	Source
2	C_{29} 5α(H)14α(H)17α(H) 20R sterane / C_{27} 5α(H)14α(H)17α(H) 20R sterane	Source
3	C_{29} 13β(H)17α(H) 20R diasterane / C_{27} 13β(H)17α(H) 20R diasterane	Source
4	C_{29} 5α(H)14α(H)17α(H) 20S sterane / C_{29} 5α(H)14α(H)17α(H) 20R sterane	Maturity, Biodegradation
5	C_{27} 13β(H)17α(H) 20S diasterane / C_{27} 13β(H)17α(H) 20R diasterane	Maturity
6	C_{29} 5α(H)14β(H)17β(H) 20R sterane / C_{29} 5α(H)14α(H)17α(H) 20R sterane	Maturity, Migration
7	C_{29} 13β(H)17α(H) 20R+20S diasteranes / C_{29} 5α(H) steranes	Migration, Source
8	C_{30} pentacyclic terpane/C_{30} 17α(H)21β(H) hopane	Source
9	C_{27} 17α(H)-22,29,30-trisnorhopane / C_{27} 18α(H)-22,29,30-trisnorhopane (T_m/T_s)	Maturity, Source
10	T_s / C_{30} 17α(H)21β(H) hopane	Maturity
11	C_{32} 17α(H)21β(H) 22S homohopane / C_{32} 17α(H)21β(H) 22R homohopane	Maturity
12	C_{30} 17β(H)21α(H) moretane / C_{30} 17α(H)21β(H) hopane	Maturity
13	C_{29} 17α(H)-25-norhopane / C_{29} 17α(H)-30-norhopane	Biodegradation
14	pristane / phytane	Source
15	2,6,10-trimethyltridecane / pristane	Maturity
16	pristane / n-heptadecane	Source, Biodegradation, Maturity
17	phytane / n-octadecane	Source, Biodegradation, Maturity

* Ratios calculated from peak areas as follows:

Parameters 1-6 m/z = 217 mass fragmentogram
Parameter 7 m/z = 217, 259 mass fragmentograms
Parameters 8-13 m/z = 191 mass fragmentogram
Parameters 14-17 capillary gas chromatogram of alkanes or whole oil/extract

TABLE 11

SUPPLEMENTARY SOURCE-DEPENDENT BIOMARKER RATIOS IN OILS FROM WINDERMERE -1 AND 2

Well and Formation	Test and Depth (m)	C_{30} Hopane / C_{29} Steranes	C_{15}, C_{16} Drimanes / C_{30} Hopane	C_{20} Isopimarane / 16βH-Phyllocladane
Windermere -1 Heathfield sst member Eumeralla Fm**	DST 1 1791-1838	4.4	0.49	6.0
Windermere -2 Basal sst mbr, Eumeralla Fm	DST 2A 3174-3230.7	0.33	23.1	2.5
* Parameter		18	19	20

* Measured from mass fragmentograms as follows:

Parameter 18 m/z 191, 217
Parameter 19 m/z 123, 191
Parameter 20 m/z 123

** Data from McKirdy (1987)

TABLE 12

OIL MATURITY BASED ON AROMATIC HYDROCARBON DISTRIBUTIONS *

WINDERMERE -1 & 2

Well & Test	Depth m	MPI	MPR	MPDF	DNR	VR calc (a)	(b)	(c)	(d)	(e) √	(f)
Windermere -1 DST 1**	1791-1838	0.49	0.81	nd	nd	0.70	N/A	0.85	N/A	0.57	nd
Windermere -2 DST 2A	3174-3230.7	1.07	1.04	0.511	4.39	1.04	N/A	0.96	1.09	0.97	0.98

* See key (next page) for determination of listed parameters
** = Data from McKirdy (1987)
nd = Not determined
N/A = Not applicable
√ = Preferred value

KEY TO AROMATIC MATURITY INDICATORS

Methylphenanthrene index (MPI), methylphenanthrene ratio (MPR), dimethylnaphthalene ratio (DNR) and calculated vitrinite reflectance (VR_{calc}) are derived from the following equations (after Radke and Welte, 1983; Radke *et al.*, 1984):

$$MPI = \frac{1.5\ (2\text{-}MP + 3\text{-}MP)}{P + 1\text{-}MP + 9\text{-}MP}$$

$$VR_{calc}\ (a) = 0.6\ MPI + 0.4\ (\text{for } VR < 1.35\%)$$

$$VR_{calc}\ (b) = -0.6\ MPI + 2.3\ (\text{for } VR > 1.35\%)$$

$$MPR = \frac{2\text{-}MP}{1\text{-}MP}$$

$$VR_{calc}\ (c) = 0.99\ \log_{10} MPR + 0.94\ (VR = 0.5\text{-}1.7\%)$$

$$DNR = \frac{2,6\text{-}DMN + 2,7\text{-}DMN}{1,5\text{-}DMN}$$

$$VR_{calc}\ (d) = 0.046\ DNR + 0.89\ (\text{for } VR = 0.9\text{-}1.5\%)$$

Where

P	=	phenanthrene
1-MP	=	1-methylphenanthrene
2-MP	=	2-methylphenanthrene
3-MP	=	3-methylphenanthrene
9-MP	=	9-methylphenanthrene
1,5-DMN	=	1,5-dimethylnaphthalene
2,6-DMN	=	2,6-dimethylnaphthalene
2,7-DMN	=	2,7-dimethylnaphthalene

Peak areas measured from m/z 156 (dimethylnaphthalene), m/z 178 (phenanthrene) and m/z 192 (methylphenanthrene) mass fragmentograms of diaromatic and triaromatic hydrocarbon fraction isolated by thin layer chromatography.

Recalibration of the methylphanthrene index using data from a suite of Australian coals has given rise to another equation for calculated vitrinite reflectance (after Boreham *et al.*, 1988):

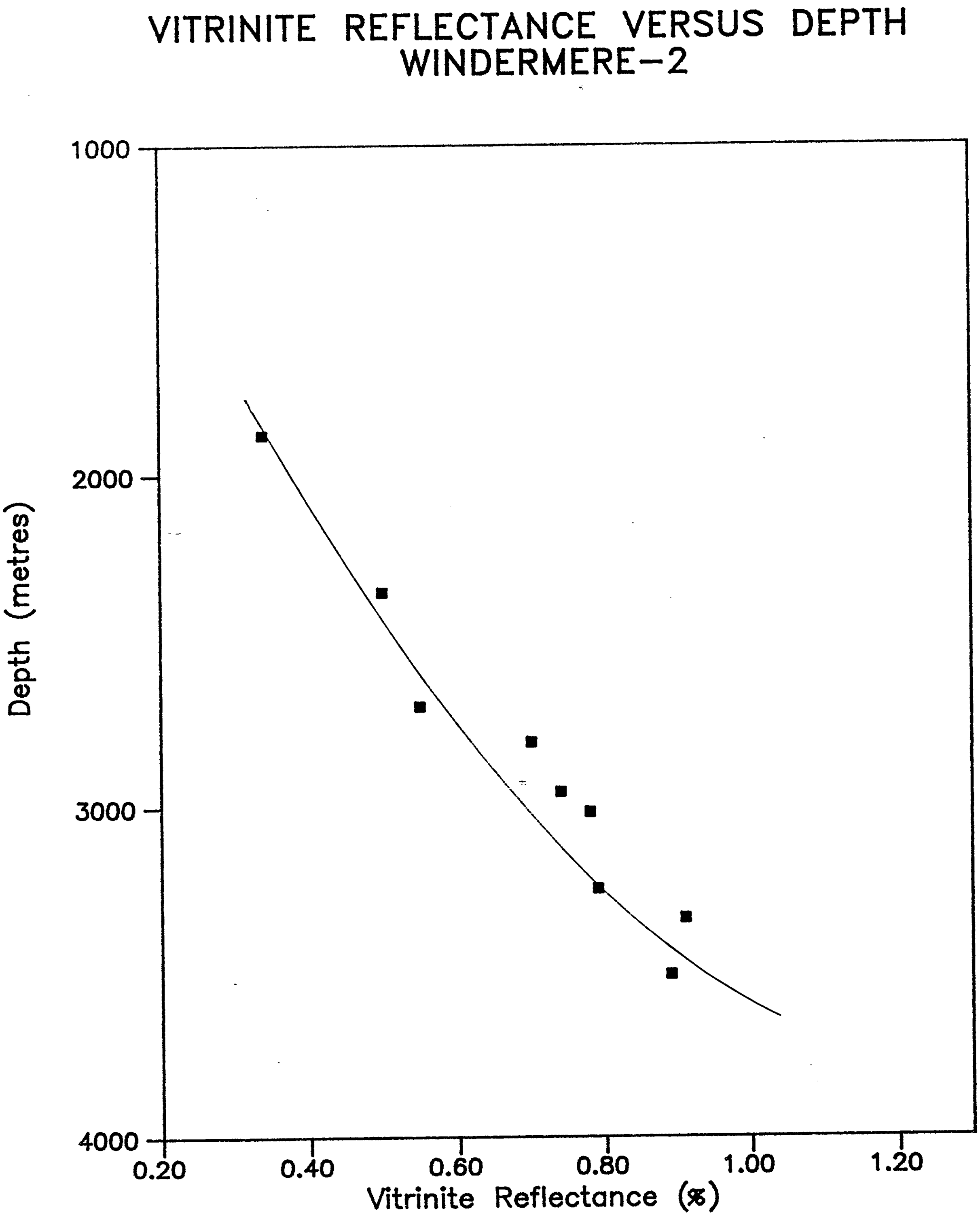
$$VR_{calc}\ (e) = 0.7\ MPI + 0.22\ (\text{for } VR < 1.7\%)$$

The methylphenanthrene distribution ratio (MPDF) and calculated vitrinite reflectance VR_{calc} (f) is derived from the following equation (after Kvalheim *et al.*, 1987):

$$MPDF = \frac{(2\text{-}MP + 3\text{-}MP)}{(2\text{-}MP + 3\text{-}MP + 1\text{-}MP + 9\text{-}MP)}$$

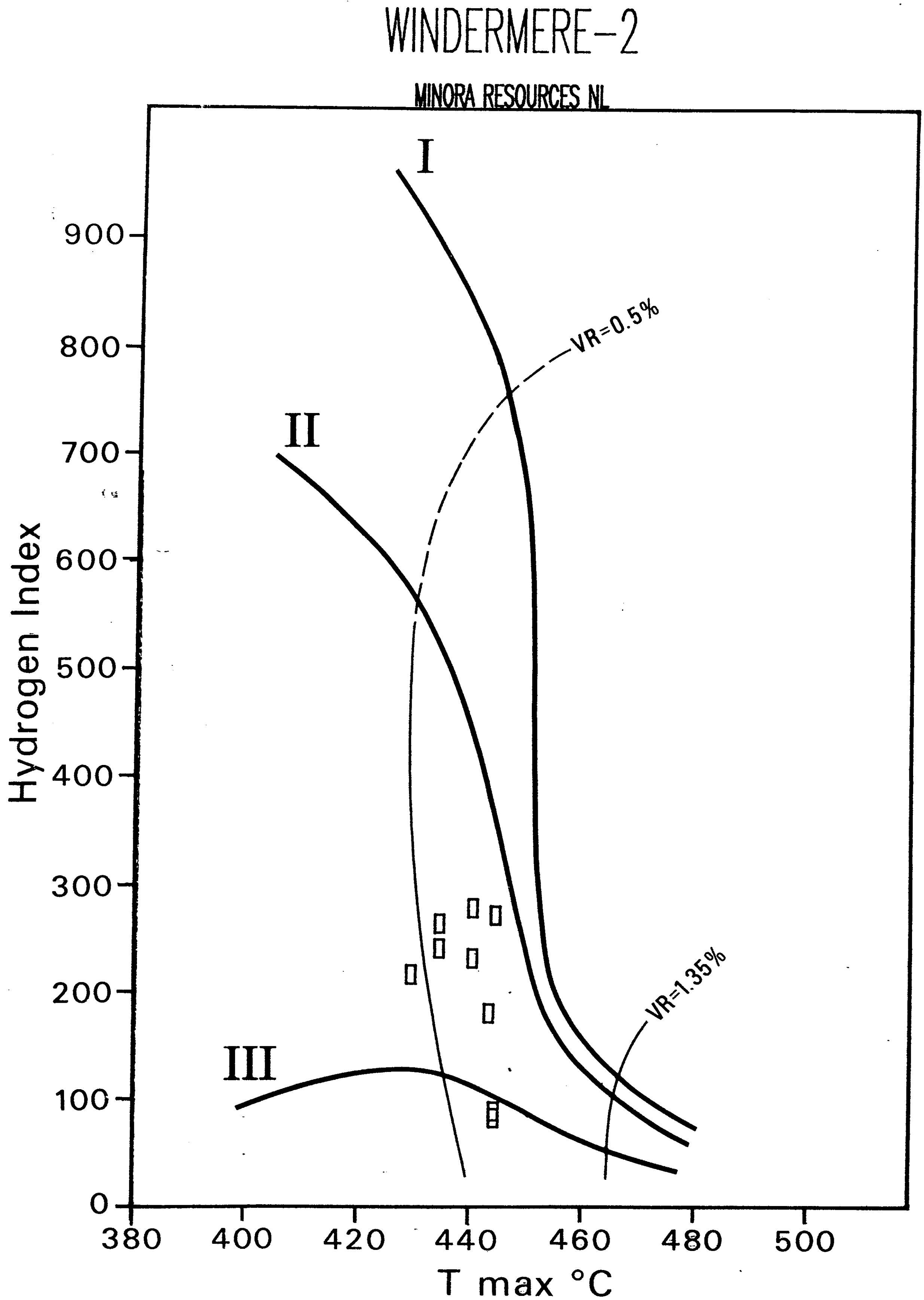
$$VR_{calc}\ (f) = -0.166 + 2.242\ MPDF$$

FIGURE 1



VITRINITE REFLECTANCE VERSUS DEPTH
WINDERMERE-2
1000
2000
3000
4000
Depth (metres)
0.20
0.40
0.60
0.80
1.00
1.20
Vitrinite Reflectance (%)

FIGURE 2



WINDERMERE-2
MINORA RESOURCES NL
I
II
III
VR=0.5%
VR=1.35%
Hydrogen Index
900
800
700
600
500
400
300
200
100
0
380
400
420
440
460
480
500
T max °C

FIGURE 3

3065

Pyrolysis Gas Chromatogram

Instrument: Varian 2700

Column: 25m BP-1 0.22mm ID

Injector temperature: 280°C

Detector temperature: 320°C

Column temperature: -20° to 280° at 4°/min

Carrier gas: Helium

Pyrolysis temperature setting: 750

* Aromatic Hydrocarbon

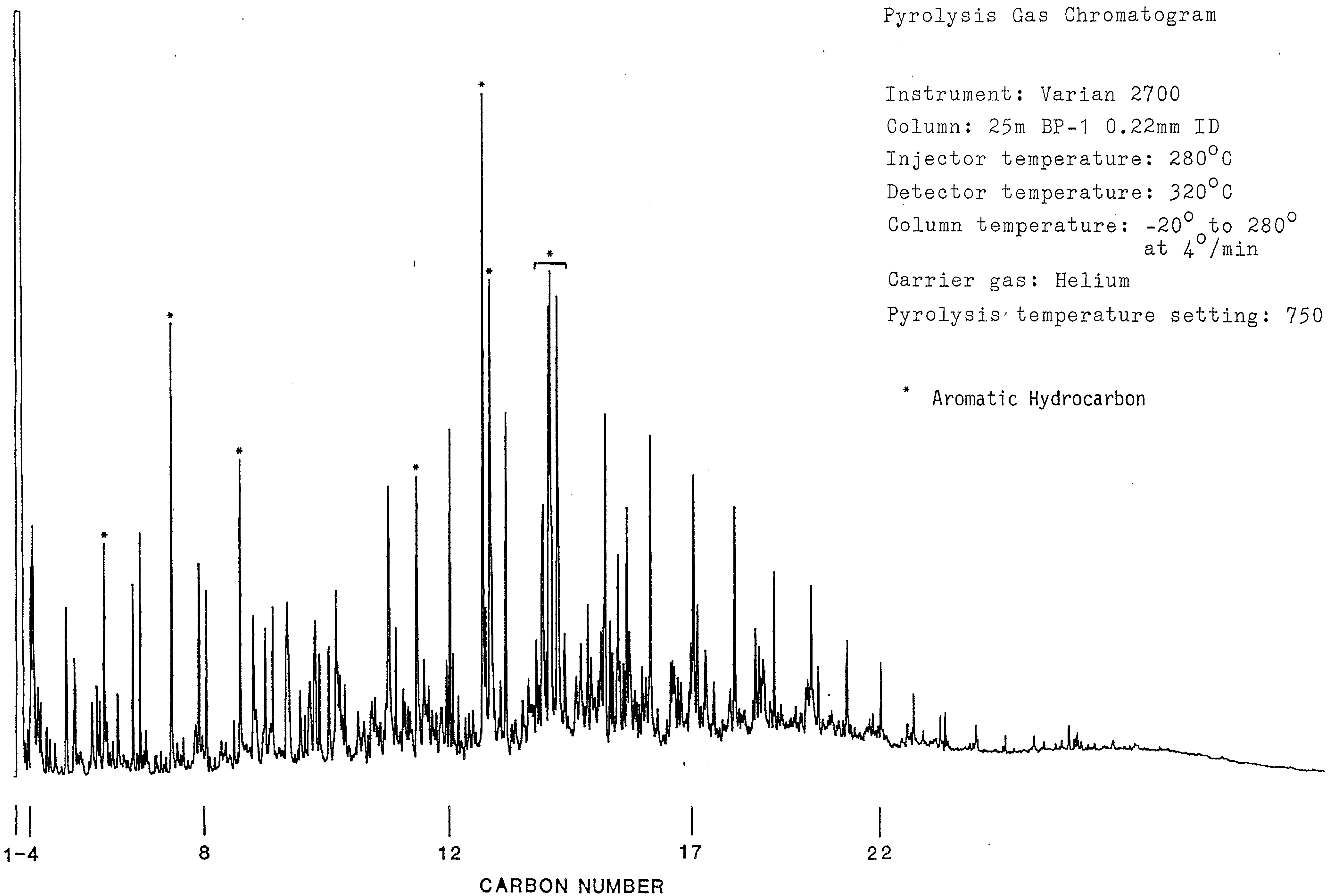
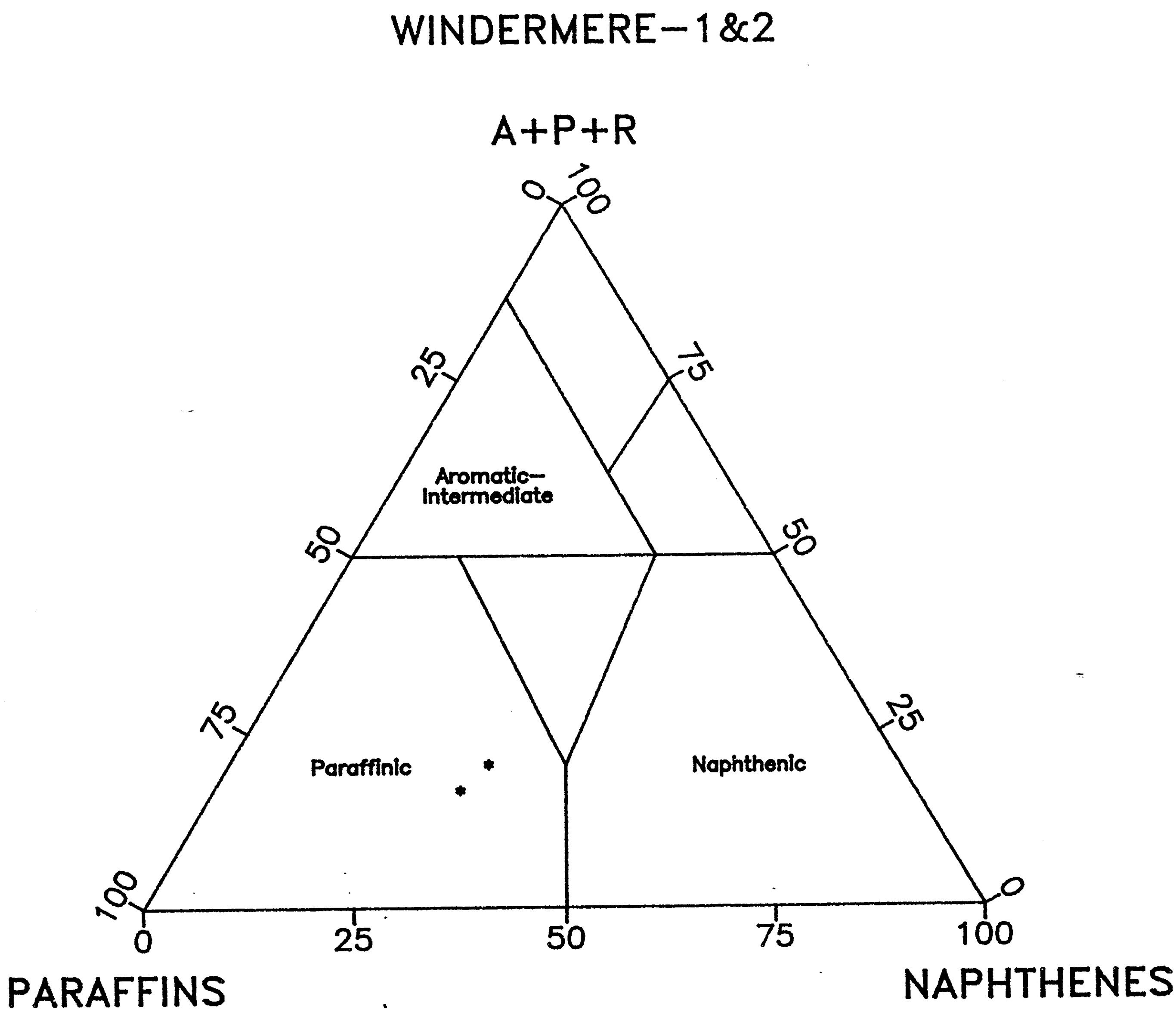


FIGURE 4



WINDERMERE-1&2
A+P+R
0
100
25
75
50
50
75
25
100
0
Aromatic-Intermediate
Paraffinic
Naphthenic
0
25
50
75
100
PARAFFINS
NAPHTHENES

FIGURE 5

WINDERMERE -2
DST 2A
GC OF EOM

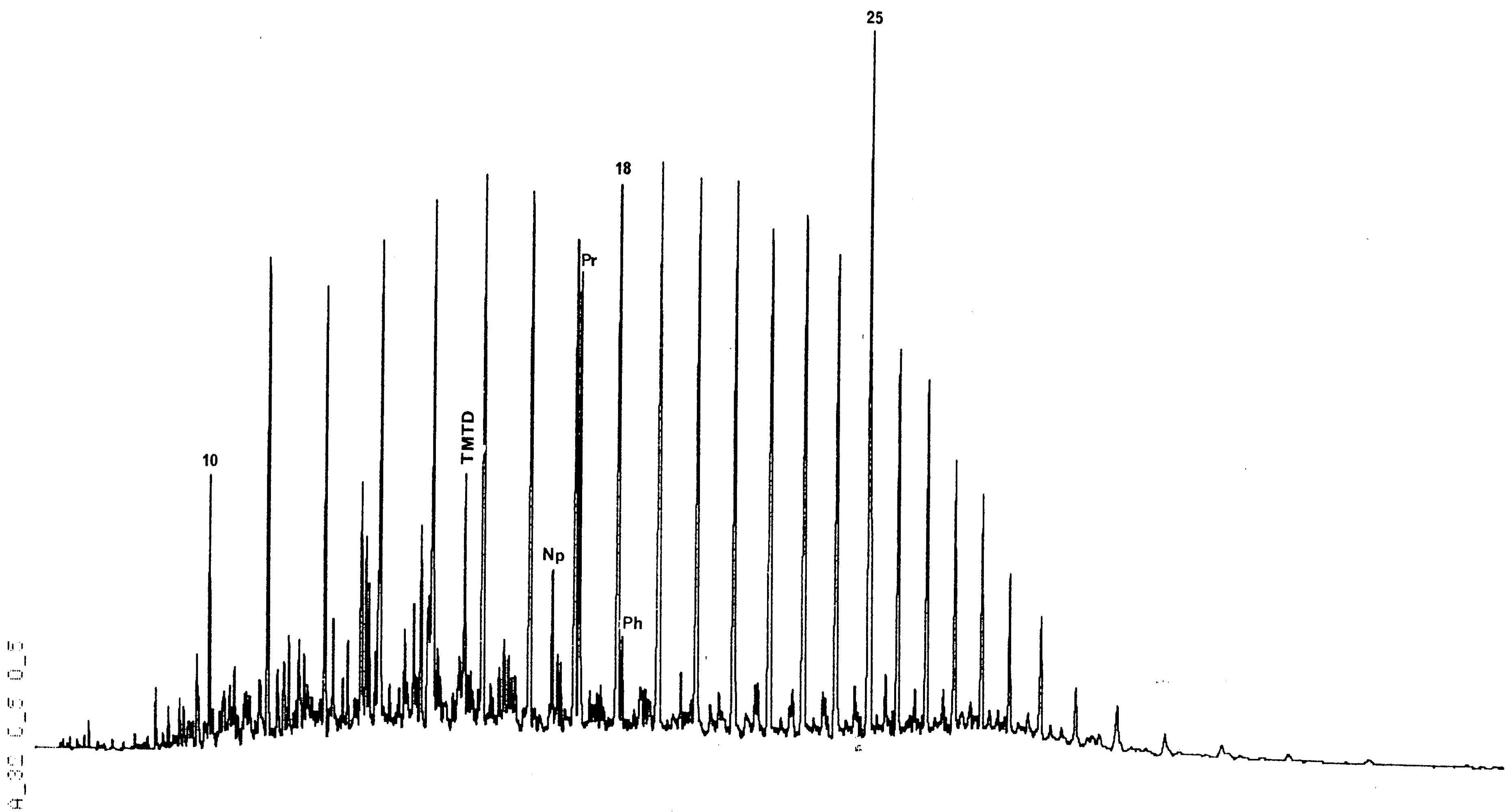


FIGURE 6

WINDERMERE -2

DST 2A

GC of Saturated Hydrocarbons

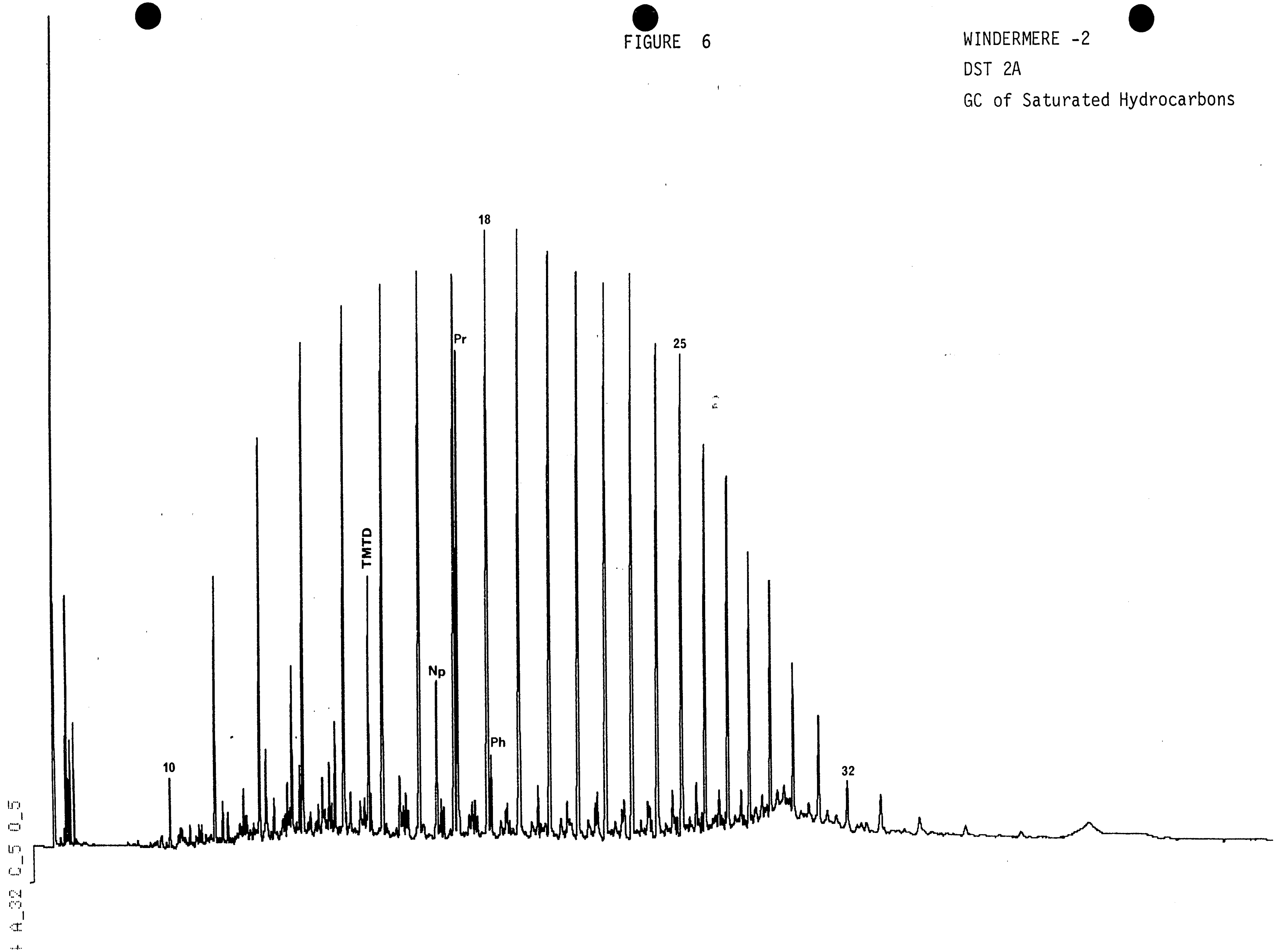
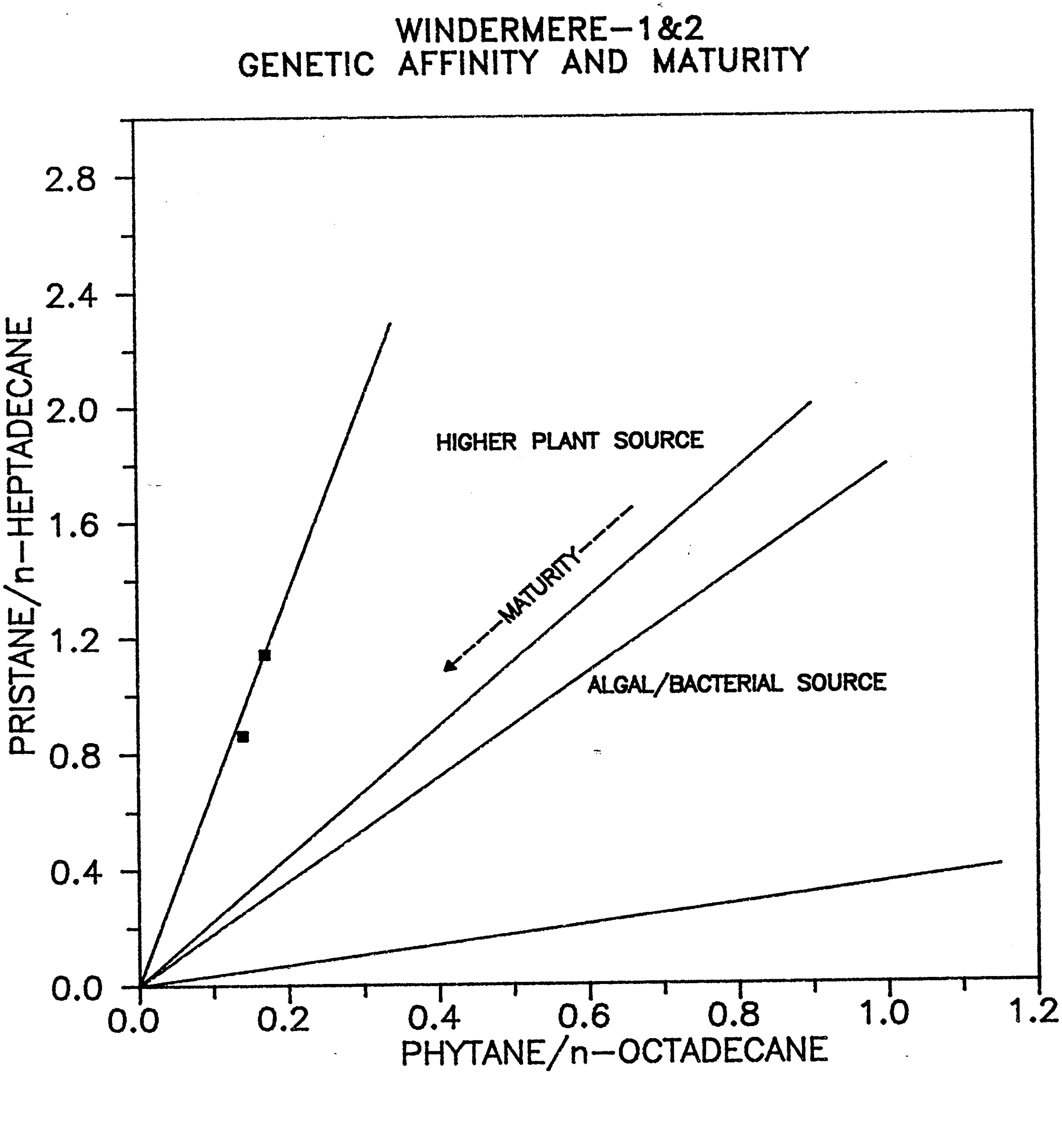


FIGURE 7



WINDERMERE-1&2
GENETIC AFFINITY AND MATURITY
HIGHER PLANT SOURCE
MATURITY
ALGAL/BACTERIAL SOURCE
PRISTANE/n-HEPTADECANE
PHYTANE/n-OCTADECANE
0.0
0.4
0.8
1.2
1.6
2.0
2.4
2.8
0.0
0.2
0.4
0.6
0.8
1.0
1.2

KEY TO AROMATIC MATURITY INDICATORS

Methylphenanthrene index (MPI), methylphenanthrene ratio (MPR), dimethylnaphthalene ratio (DNR) and calculated vitrinite reflectance (VR_{calc}) are derived from the following equations (after Radke and Welte, 1983; Radke *et al.*, 1984):

$$MPI = \frac{1.5\,(2\text{-}MP + 3\text{-}MP)}{P + 1\text{-}MP + 9\text{-}MP}$$

$$VR_{calc}\ (a) = 0.6\ MPI + 0.4 \quad (\text{for } VR < 1.35\%)$$

$$VR_{calc}\ (b) = -0.6\ MPI + 2.3 \quad (\text{for } VR > 1.35\%)$$

$$MPR = \frac{2\text{-}MP}{1\text{-}MP}$$

$$VR_{calc}\ (c) = 0.99\ \log_{10} MPR + 0.94 \quad (VR = 0.5\text{-}1.7\%)$$

$$DNR = \frac{2{,}6\text{-}DMN + 2{,}7\text{-}DMN}{1{,}5\text{-}DMN}$$

$$VR_{calc}\ (d) = 0.046\ DNR + 0.89 \quad (\text{for } VR = 0.9\text{-}1.5\%)$$

Where

P	=	phenanthrene
1-MP	=	1-methylphenanthrene
2-MP	=	2-methylphenanthrene
3-MP	=	3-methylphenanthrene
9-MP	=	9-methylphenanthrene
1,5-DMN	=	1,5-dimethylnaphthalene
2,6-DMN	=	2,6-dimethylnaphthalene
2,7-DMN	=	2,7-dimethylnaphthalene

Peak areas measured from m/z 156 (dimethylnaphthalene), m/z 178 (phenanthrene) and m/z 192 (methylphenanthrene) mass fragmentograms of diaromatic and triaromatic hydrocarbon fraction isolated by thin layer chromatography.

Recalibration of the methylphanthrene index using data from a suite of Australian coals has given rise to another equation for calculated vitrinite reflectance (after Boreham *et al.*, 1988):

$$VR_{calc}\ (e) = 0.7\ MPI + 0.22 \quad (\text{for } VR < 1.7\%)$$

The methylphenanthrene distribution ratio (MPDF) and calculated vitrinite reflectance VR_{calc} (f) is derived from the following equation (after Kvalheim *et al.*, 1987):

$$MPDF = \frac{(2\text{-}MP + 3\text{-}MP)}{(2\text{-}MP + 3\text{-}MP + 1\text{-}MP + 9\text{-}MP)}$$

$$VR_{calc}\ (f) = -0.166 + 2.242\ MPDF$$

FIGURES 8 - 16

MASS FRAGMENTOGRAMS OF NAPHTHENES IN WINDERMERE -2, DST 2A, OIL SHOW

Figs 8,9	m/z	217, 259	Steranes, diasteranes
Figs 10	m/z	231	4-methyl steranes
Figs 11	m/z	83	Alkylcyclohexanes
	m/z	183	Isoprenoid alkanes
Figs 12,13	m/z	191	Tricyclic & Tetracyclic Terpanes
Fig 14	m/z	123	Drimanes, rearranged drimanes
Figs 15,16	m/z	123	Diterpanes

FIGURE 8

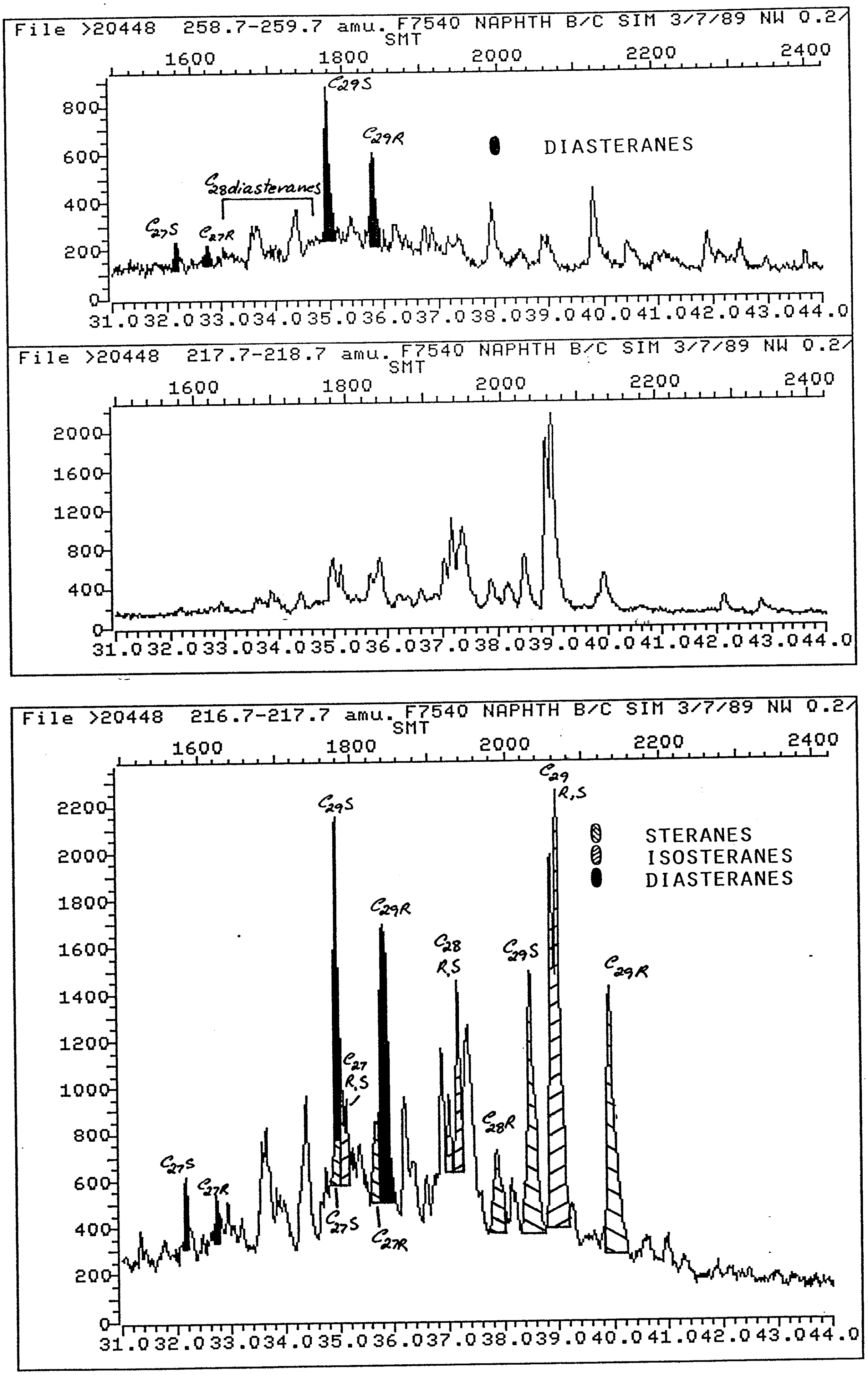

File >20448 258.7-259.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
C29S
C29R
DIASTERANES
C28diasteranes
C27S
C27R
File >20448 217.7-218.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
File >20448 216.7-217.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
C29 R,S
STERANES
ISOSTERANES
DIASTERANES
C29S
C29R
C28 R,S
C29S
C29R
C27 R,S
C28R
C27S
C27R
C27S
C27R

FIGURE 9

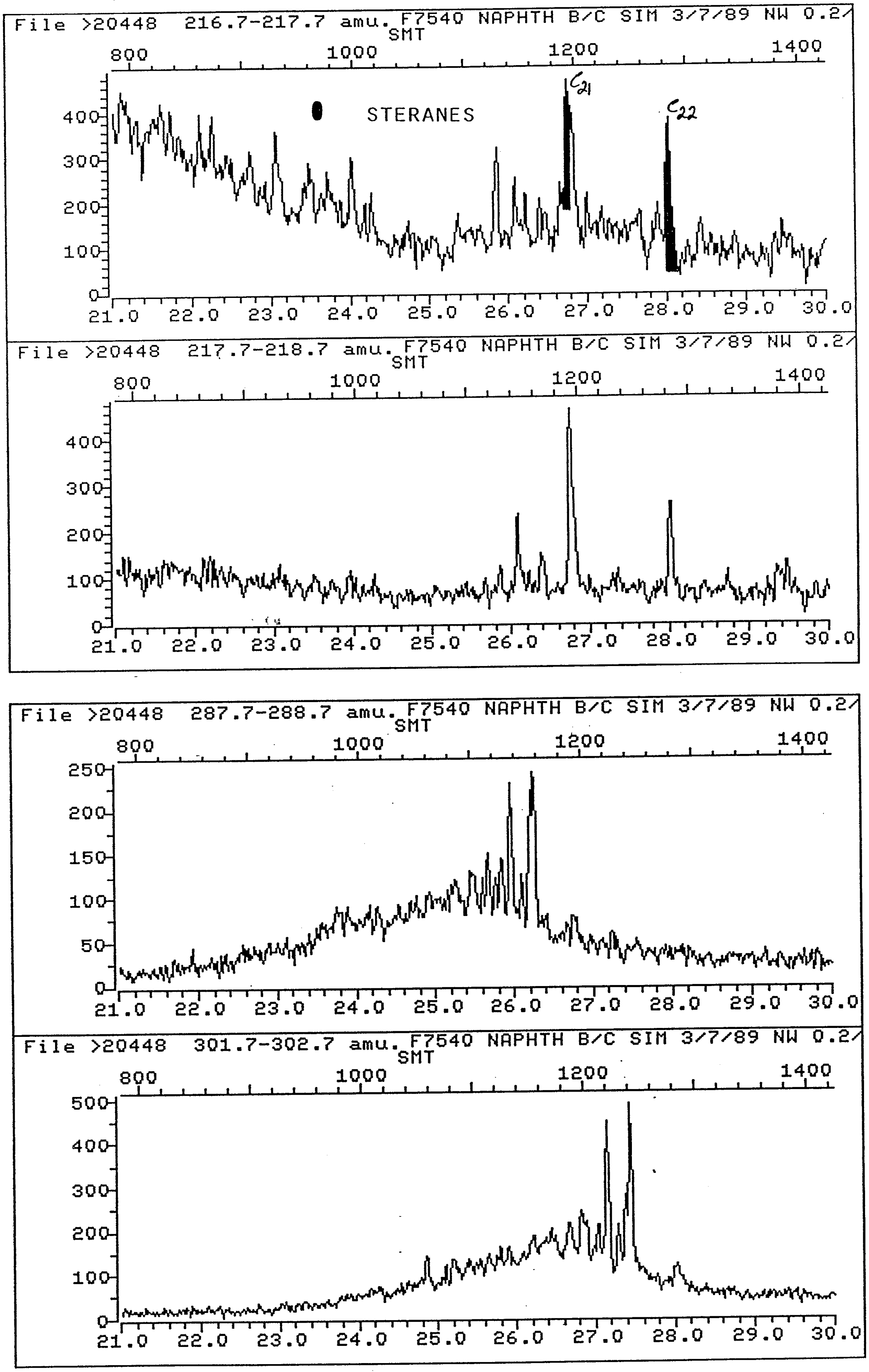
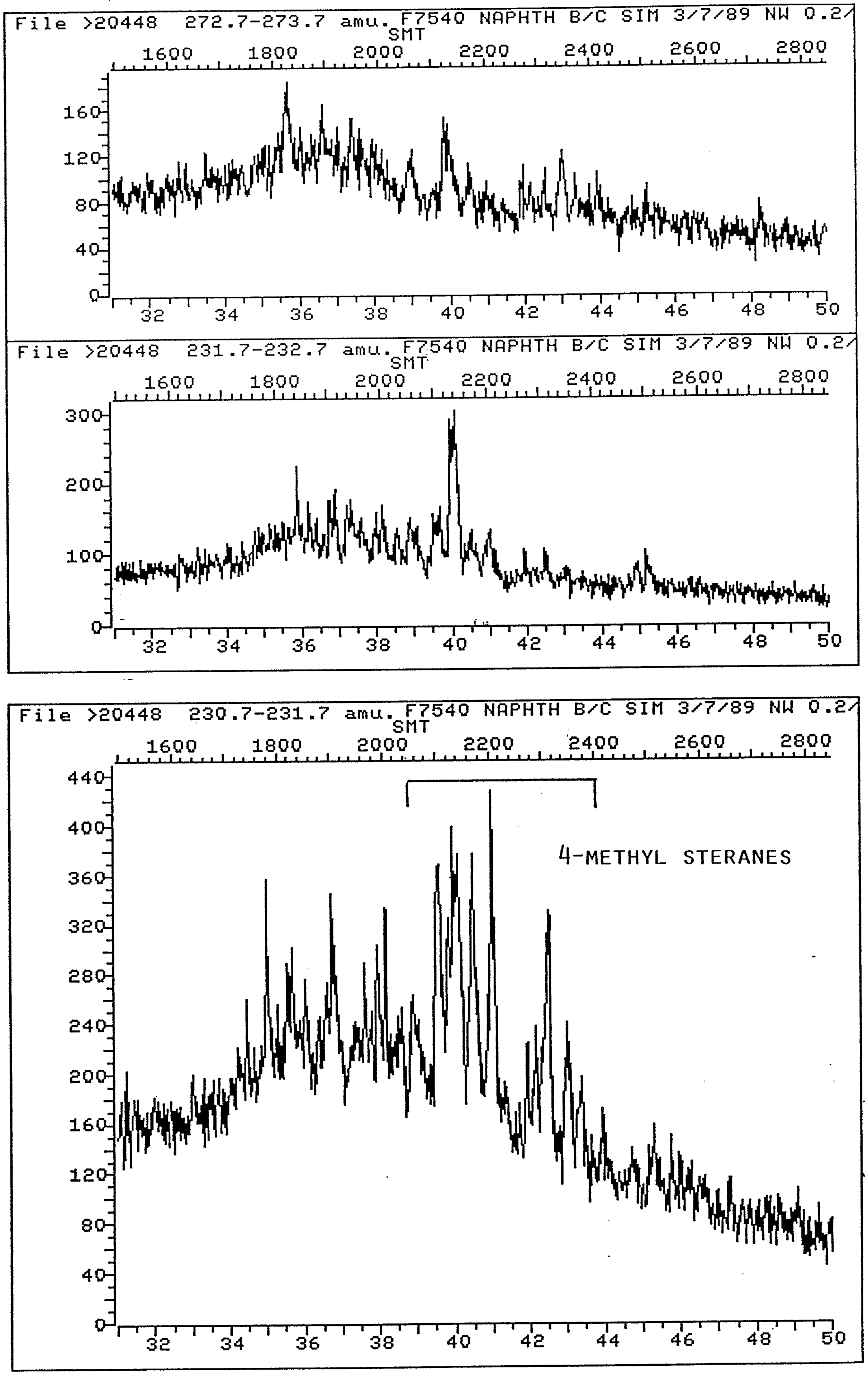
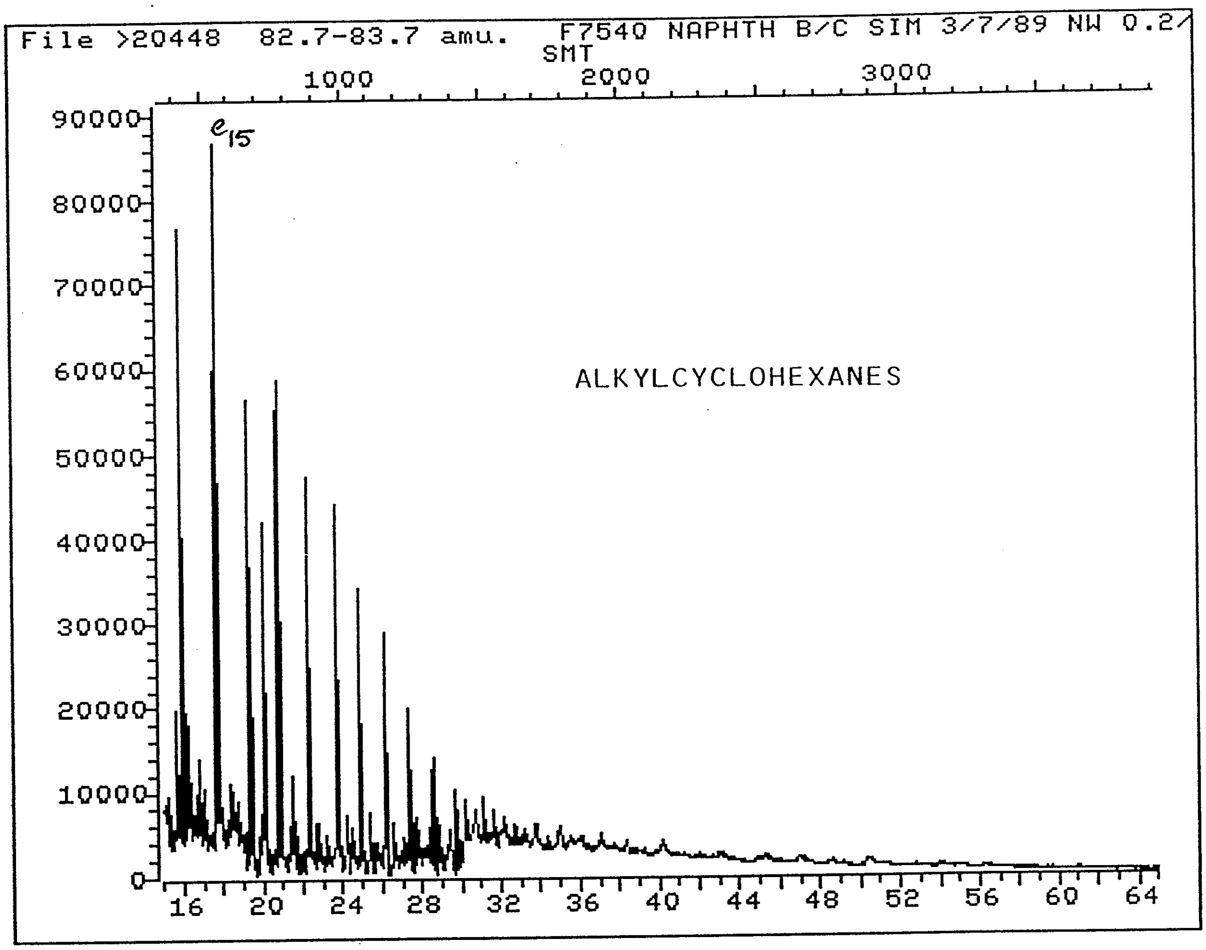

File >20448 216.7-217.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
800 1000 1200 1400
STERANES
C21
C22
0 100 200 300 400
21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0
File >20448 217.7-218.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
800 1000 1200 1400
0 100 200 300 400
21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0
File >20448 287.7-288.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
800 1000 1200 1400
0 50 100 150 200 250
21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0
File >20448 301.7-302.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
800 1000 1200 1400
0 100 200 300 400 500
21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0

FIGURE 10

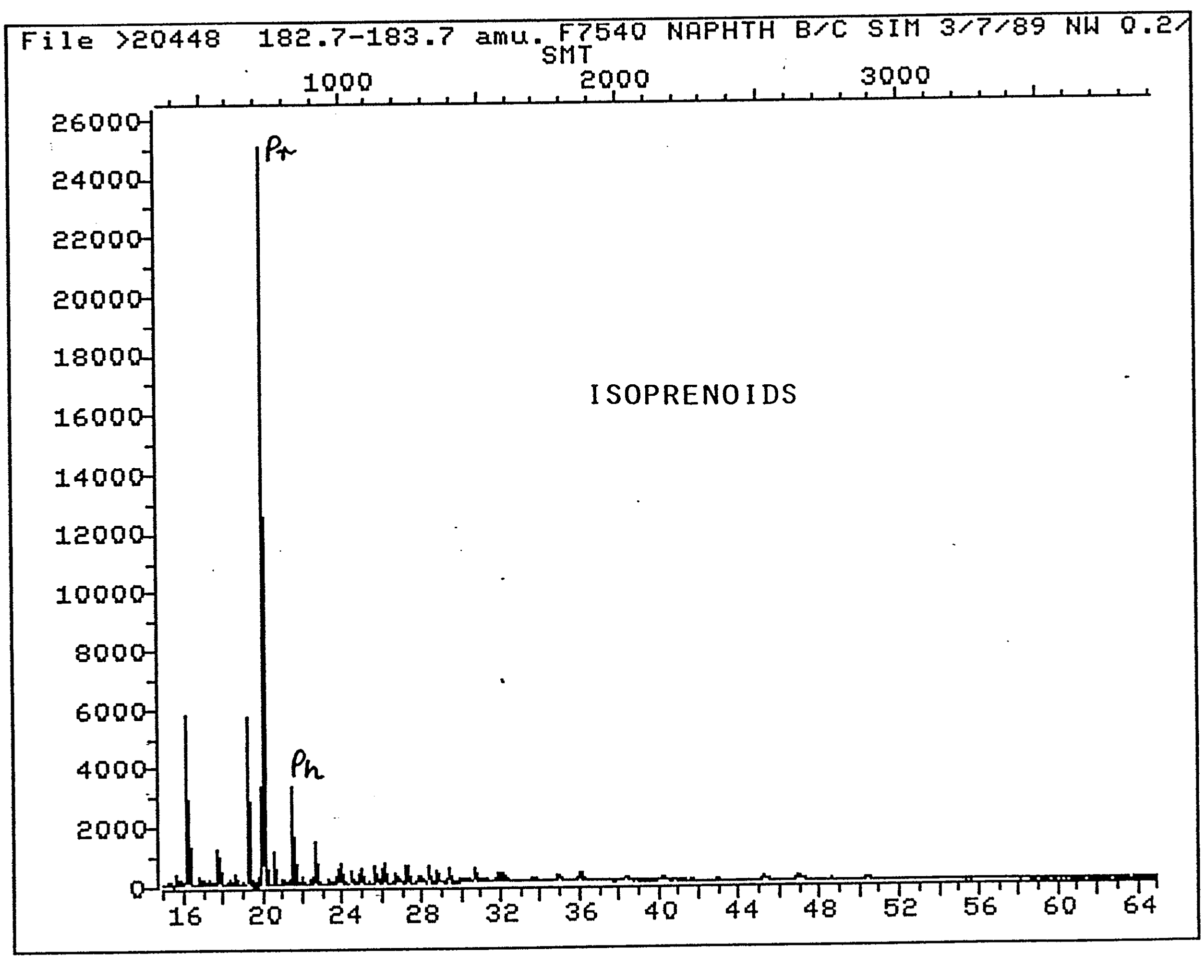


File >20448 272.7-273.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
File >20448 231.7-232.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
File >20448 230.7-231.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
4-METHYL STERANES

FIGURE 11



File >20448 82.7-83.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
1000
2000
3000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
C_{15}
ALKYLCYCLOHEXANES
16
20
24
28
32
36
40
44
48
52
56
60
64



File >20448 182.7-183.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
1000
2000
3000
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Pr
Ph
ISOPRENOIDS
16
20
24
28
32
36
40
44
48
52
56
60
64

FIGURE 12

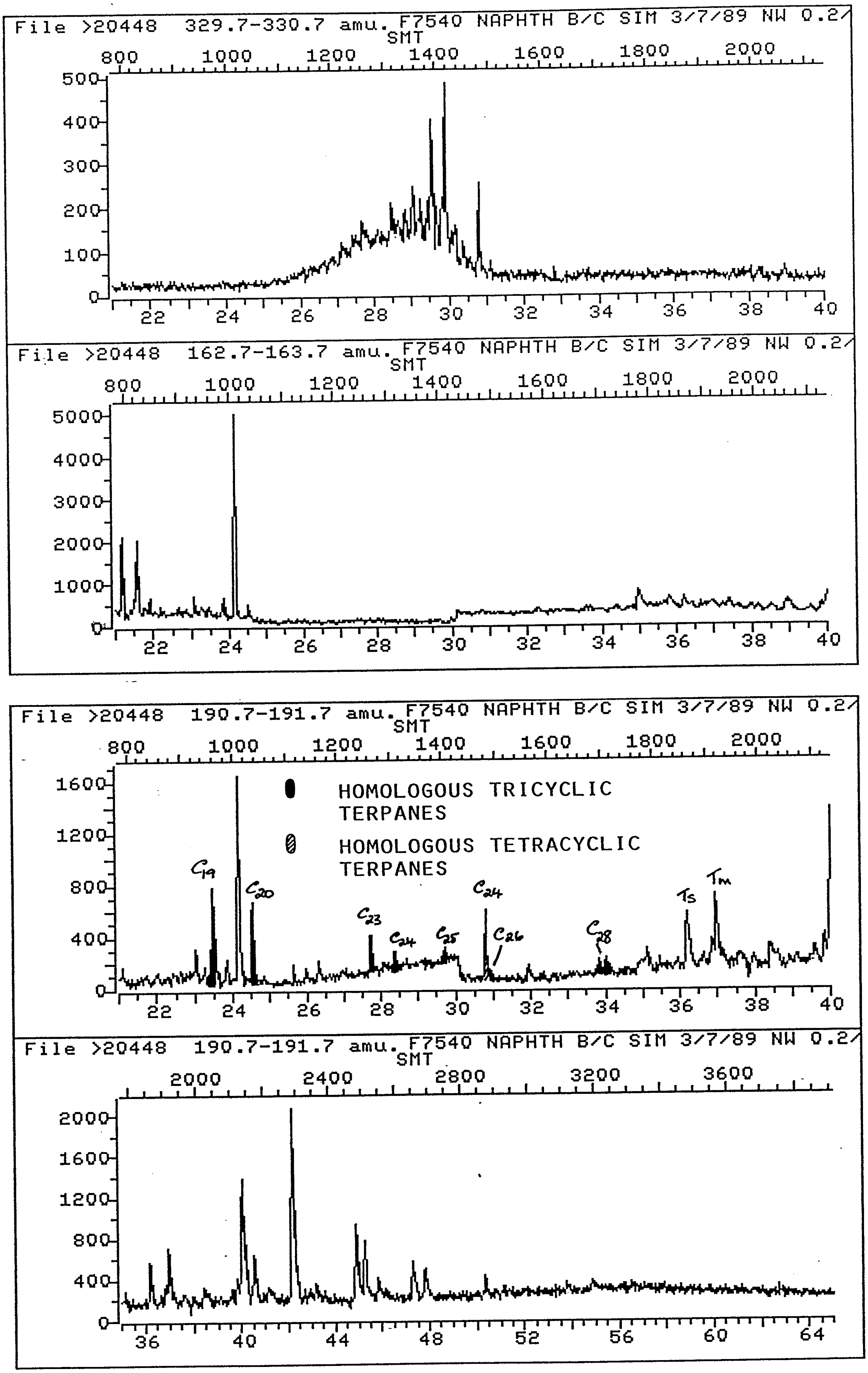

File >20448 329.7-330.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
800 1000 1200 1400 1600 1800 2000
500 400 300 200 100 0
22 24 26 28 30 32 34 36 38 40
File >20448 162.7-163.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
800 1000 1200 1400 1600 1800 2000
5000 4000 3000 2000 1000 0
22 24 26 28 30 32 34 36 38 40
File >20448 190.7-191.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
800 1000 1200 1400 1600 1800 2000
1600 1200 800 400 0
HOMOLOGOUS TRICYCLIC TERPANES
HOMOLOGOUS TETRACYCLIC TERPANES
C19
C20
C23
C24
C25
C24
C26
C28
Ts
Tm
22 24 26 28 30 32 34 36 38 40
File >20448 190.7-191.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
2000 2400 2800 3200 3600
2000 1600 1200 800 400 0
36 40 44 48 52 56 60 64

FIGURE 13

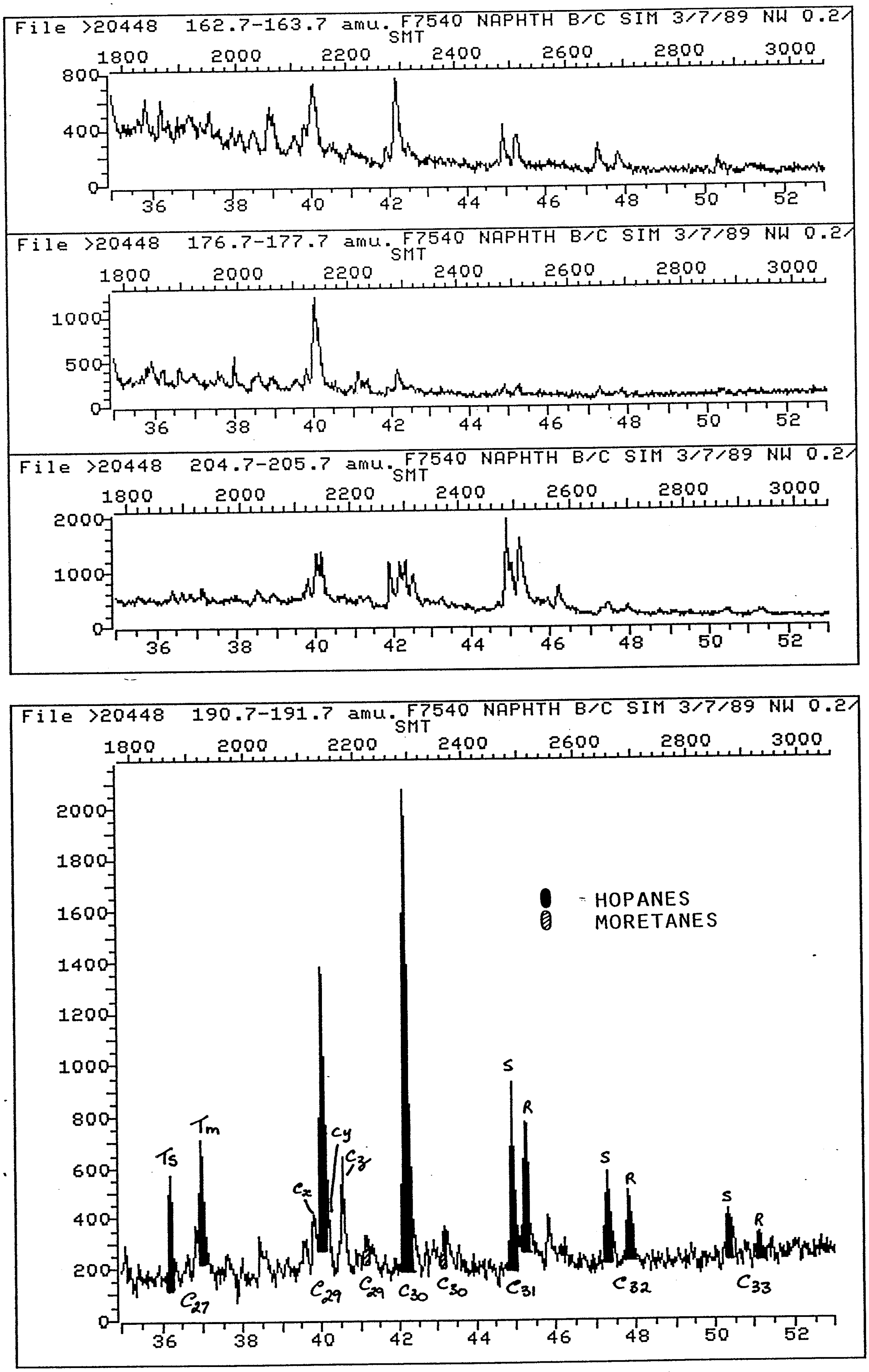

File >20448 162.7-163.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
File >20448 176.7-177.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
File >20448 204.7-205.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
File >20448 190.7-191.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
HOPANES
MORETANES
Ts
Tm
Cx
Cy
Cz
S
R
C27
C29
C29
C30
C30
C31
C32
C33

FIGURE 14

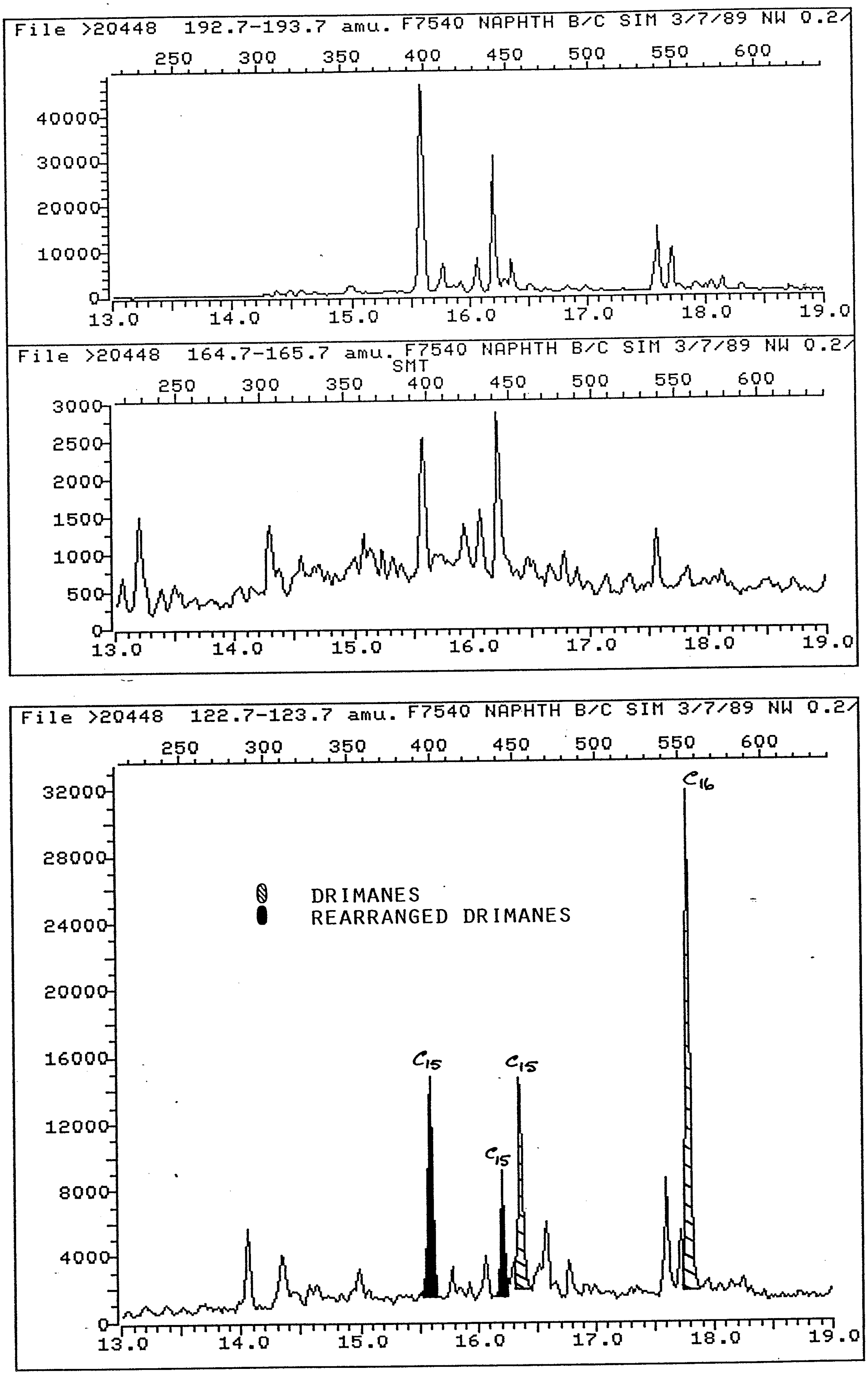
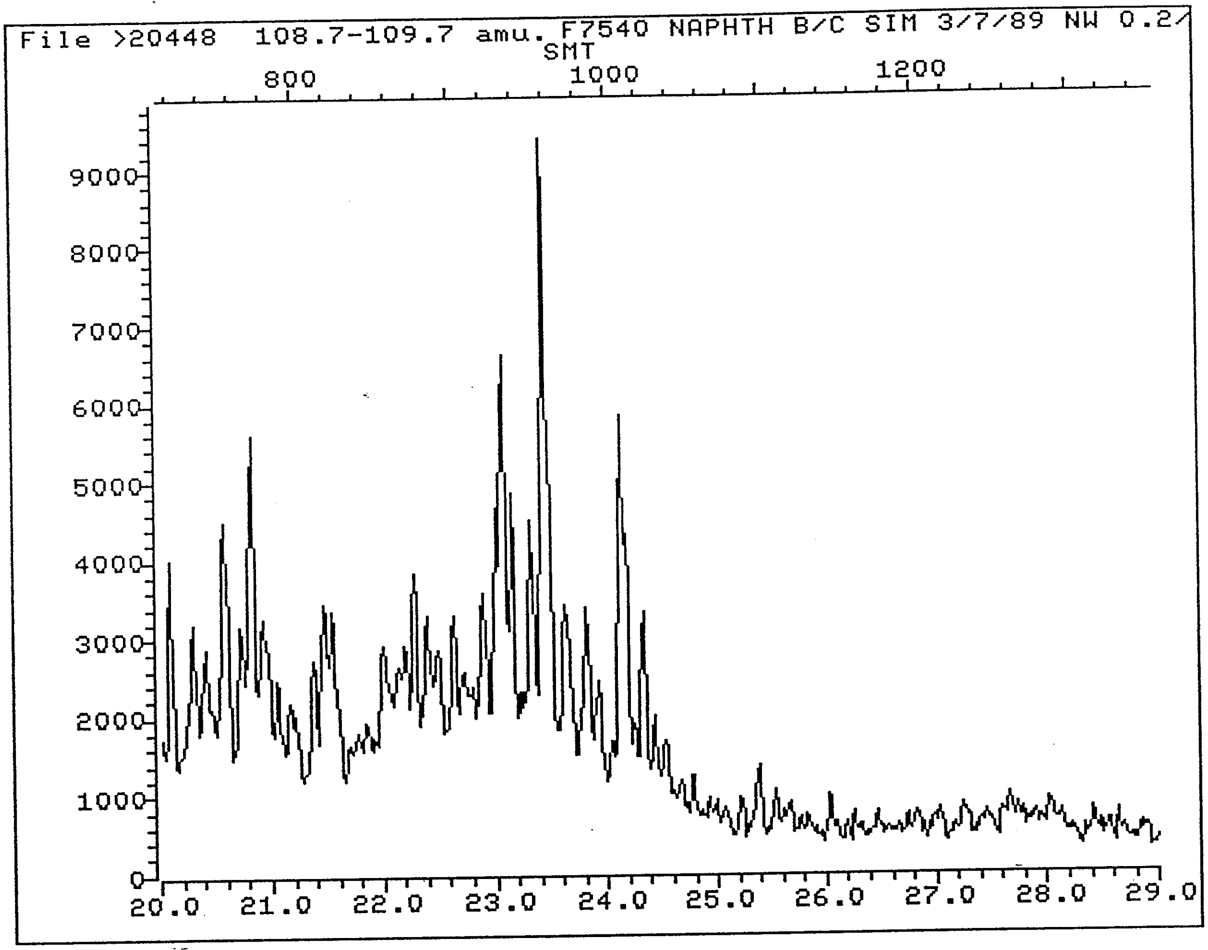
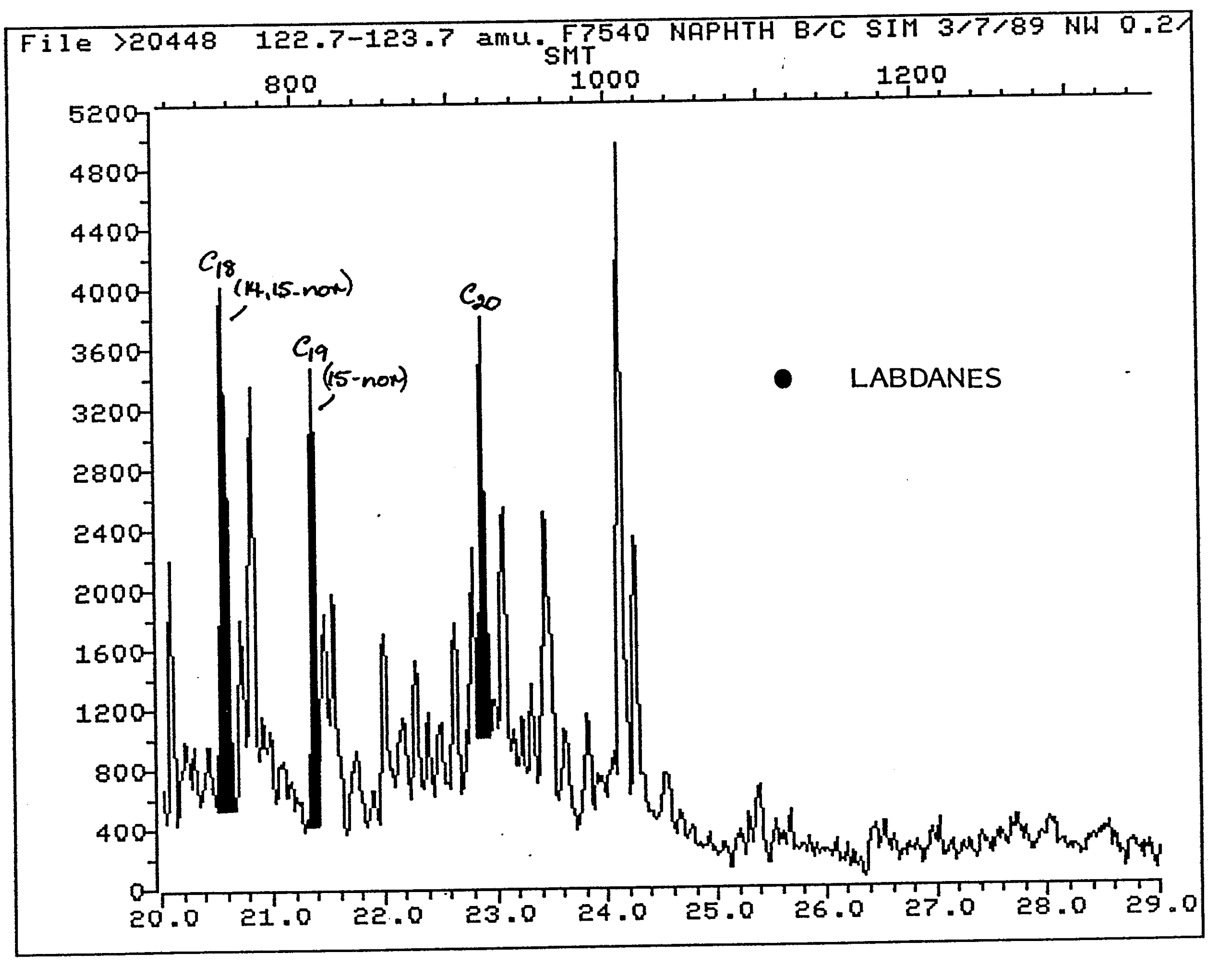

File >20448 192.7-193.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
File >20448 164.7-165.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
File >20448 122.7-123.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
DRIMANES
REARRANGED DRIMANES
C_{15}
C_{15}
C_{15}
C_{16}

FIGURE 15

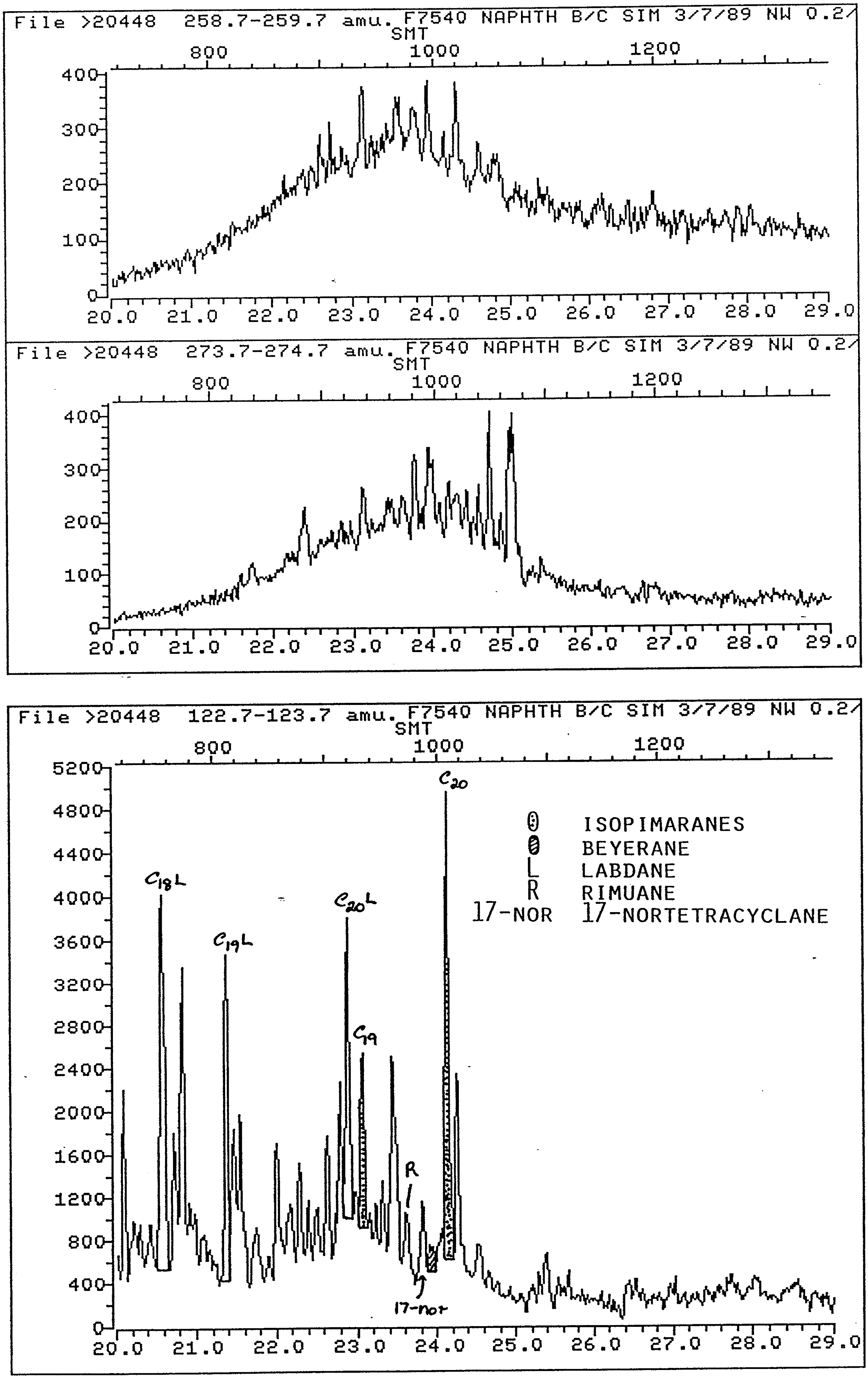


File >20448 108.7-109.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
800
1000
1200
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
20.0
21.0
22.0
23.0
24.0
25.0
26.0
27.0
28.0
29.0



File >20448 122.7-123.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
800
1000
1200
5200
4800
4400
4000
3600
3200
2800
2400
2000
1600
1200
800
400
0
C_{18} (14,15-nor)
C_{19} (15-nor)
C_{20}
● LABDANES
20.0
21.0
22.0
23.0
24.0
25.0
26.0
27.0
28.0
29.0

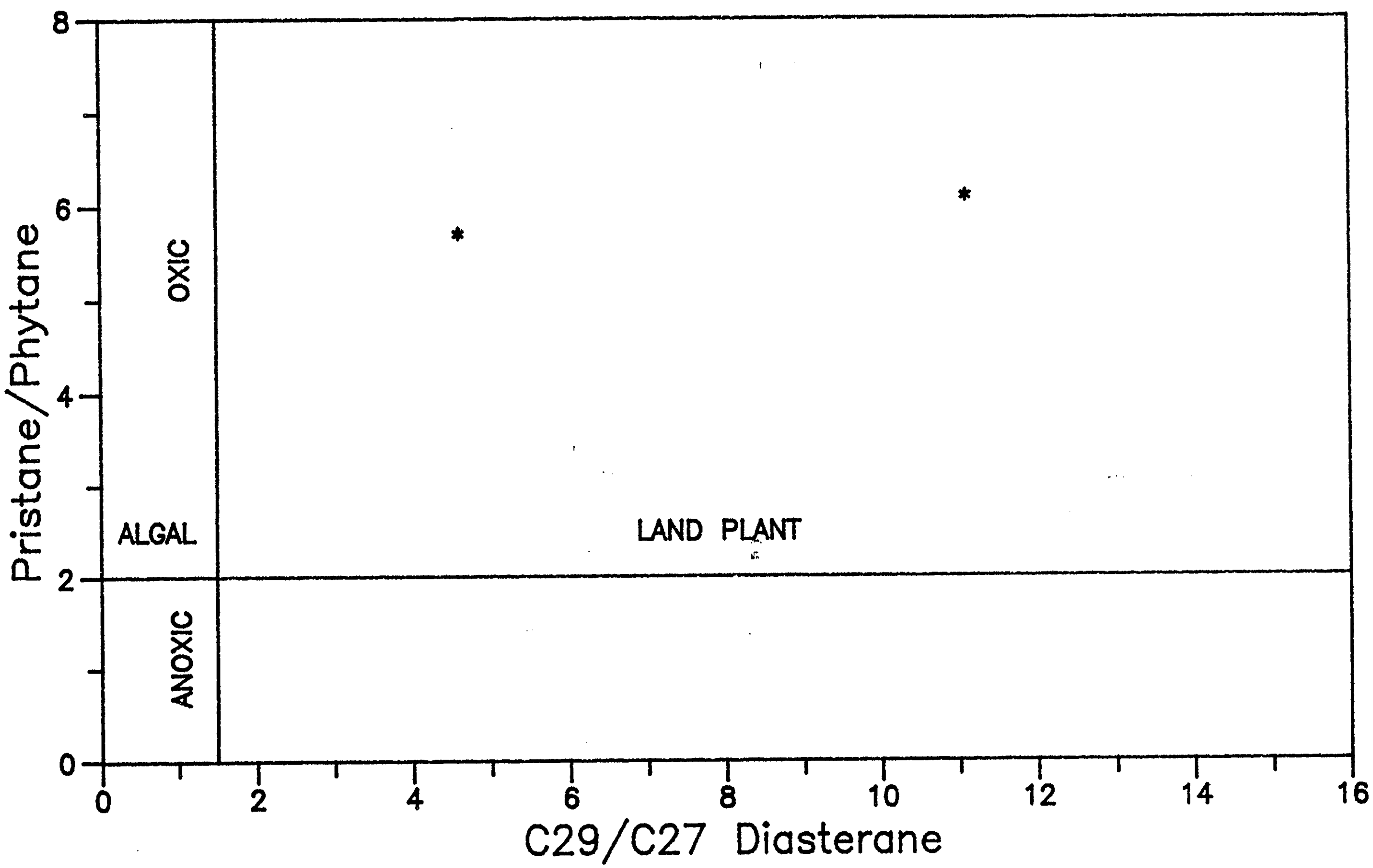
FIGURE 16



File >20448 258.7-259.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
File >20448 273.7-274.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
File >20448 122.7-123.7 amu. F7540 NAPHTH B/C SIM 3/7/89 NW 0.2/
SMT
$C_{18}L$
$C_{19}L$
$C_{20}L$
C_{19}
C_{20}
R
17-nor
ISOPIMARANES
BEYERANE
L LABDANE
R RIMUANE
17-NOR 17-NORTETRACYCLANE

FIGURE 17

WINDERMERE-1&2
OIL SOURCE AFFINITY



amdel

FIGURES 18, 19

MASS FRAGMENTOGRAMS OF AROMATIC HYDROCARBONS IN WINDERMERE -2, DST 2A, OIL SHOW

Fig 18 m/z 178 + 191 + 192 + 205 + 206

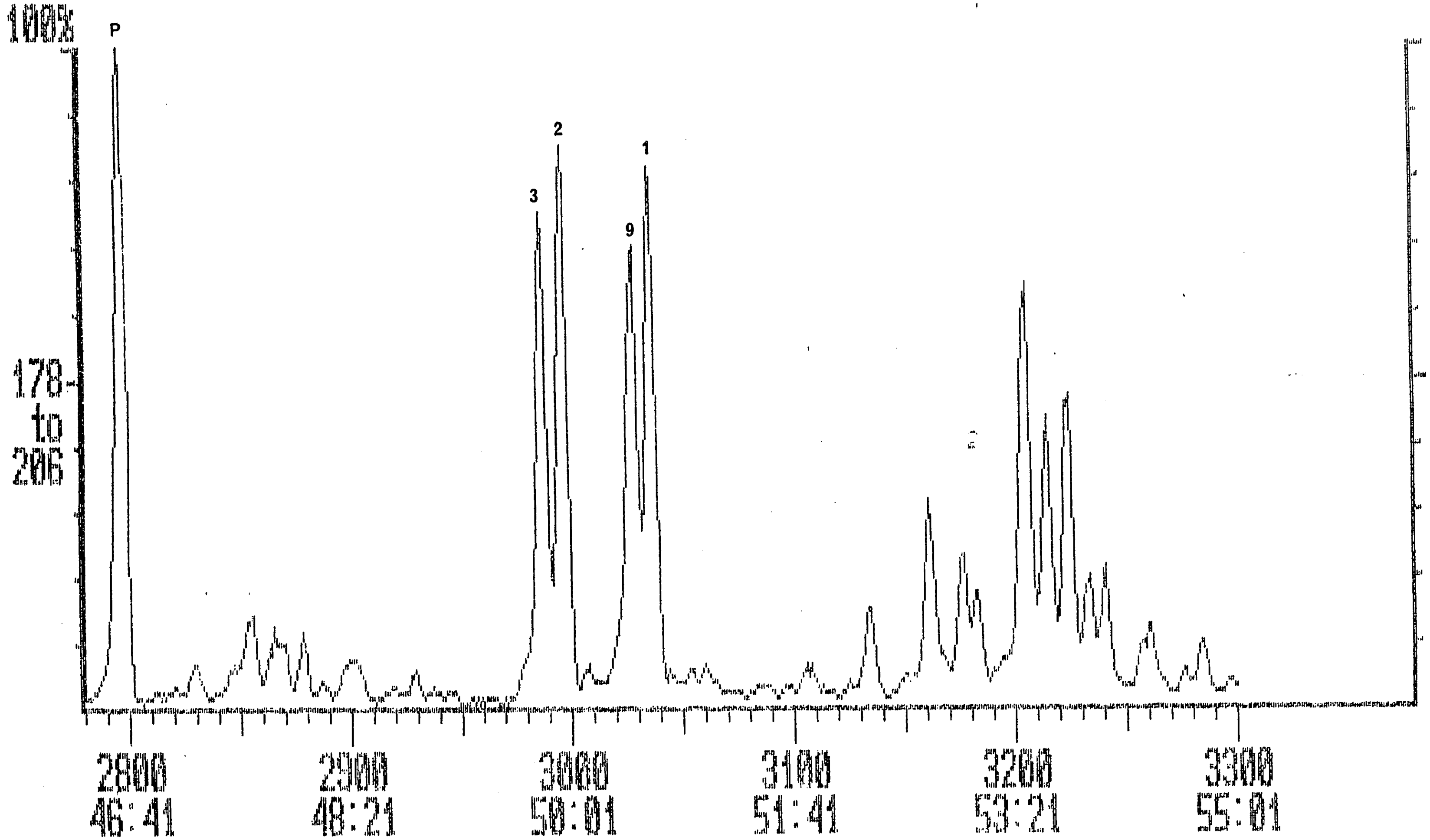
phenanthrene, methylphenanthrenes, dimethylphenanthrenes

Fig 19 m/z 156 + 169 + 170

dimethylnaphthalenes, trimethylnaphthalenes

FIGURE 18

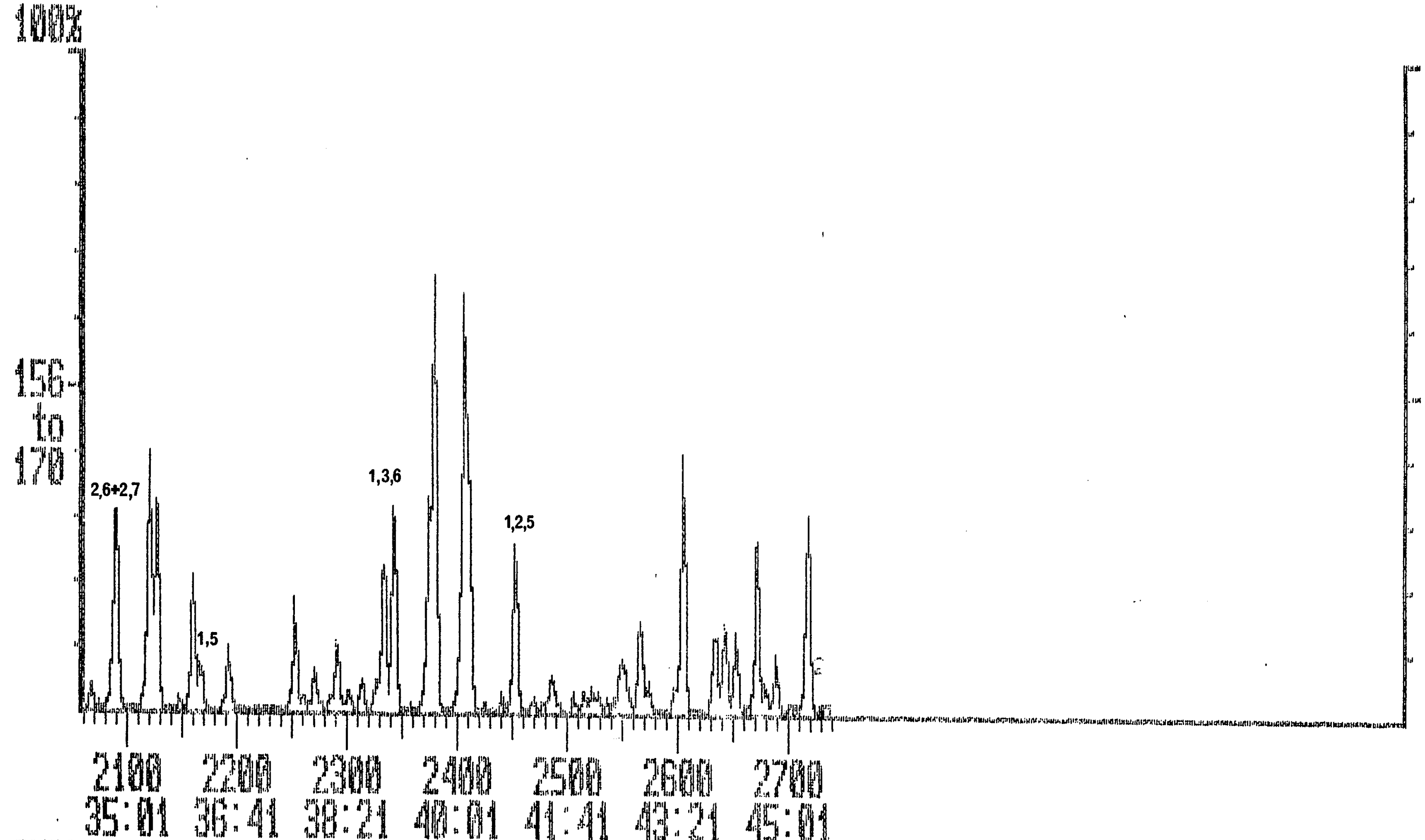
Chromatogram C:\ITD\GEN-156 Acquired: Jun-14-1989 21:43:14
Comment: WINDEMERE MPI RUN
Scan Range: 2780 - 3300 Scan: 2780 Int = 537 @ 46:21 100% = 58848



CHRO>

FIGURE 19

Chromatogram C:\ITD\GEN-156 Acquired: Jun-14-1989 21:43:14
Comment: WINDEMERE MPI RUN
Scan Range: 2060 - 2740 Scan: 2060 Int = 29 @ 34:21 100% = 14712



CHRO>

APPENDIX 1

FORMATION TOPS, WINDERMERE -2

Unit	Depth (KB) metres
Gellibrnad Marl	100
Clifton Fm	357
Dilwyn Fm	425
Pember Mudstone	667.2
Pebble Point Fm	715.5
Paaratte Fm	750
Belfast Mudstone	950
Eumeralla Fm	
- Upper	1009.3
- Middle	1170
- Heathfield sst Mbr	?1671
- Lower	1806.6
- Basal sst Mbr	?3187
Crayfish Fm	?3359
TD	3595

APPENDIX 2

HISTOGRAMS OF VITRINITE REFLECTANCE MEASUREMENTS, WINDERMERE -2

VITRINITE REFLECTANCE VALUES

Well Name: WINDERMERE-2
Depth: 1876 m

Sorted List

0.26
0.30
0.32
0.32
0.43
0.43

Number of values= 6

Mean of values 0.34
Standard Deviation 0.06

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

26-28	*
29-31	*
32-34	**
35-37	
38-40	
41-43	**

VITRINITE REFLECTANCE VALUES

Well Name: WINDERMERE-2
Depth: 2352 m

Sorted List

0.37	0.48	0.53
0.39	0.49	0.54
0.40	0.49	0.54
0.40	0.49	0.58
0.41	0.51	0.61
0.42	0.51	0.62
0.46	0.52	0.63
0.46	0.53	
0.47	0.53	
0.47	0.53	

Number of values= 27

Mean of values 0.50
Standard Deviation 0.07

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

```
37-39    **
40-42    ****
43-45
46-48    *****
49-51    *****
52-54    *****
55-57    **
58-60    *
61-63    ***
```

VITRINITE REFLECTANCE VALUES

Well Name: WINDERMERE-2
Depth: 2697 m

Sorted List

0.42	0.56
0.42	0.56
0.44	0.58
0.45	0.60
0.48	0.61
0.50	0.63
0.50	0.65
0.51	0.70
0.54	0.73
0.54	

Number of values= 19

Mean of values 0.55
Standard Deviation 0.09

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

42-44	***
45-47	*
48-50	***
51-53	*
54-56	**
57-59	***
60-62	**
63-65	**
66-68	
69-71	*
72-74	*

VITRINITE REFLECTANCE VALUES

Well Name: WINDERMERE-2
Depth: 2805-2810 m

Sorted List

0.61	0.73	0.80	0.86
0.65	0.74	0.80	0.87
0.67	0.74	0.80	0.91
0.68	0.74	0.81	
0.68	0.75	0.82	
0.69	0.76	0.82	
0.71	0.76	0.82	
0.71	0.79	0.83	
0.73	0.79	0.84	
0.73	0.80	0.86	

Number of values= 33

Mean of values 0.77
Standard Deviation 0.07

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

61-63	*
64-66	*
67-69	****
70-72	**
73-75	*******
76-78	**
79-81	*******
82-84	*****
85-87	***
88-90	
91-93	*

VITRINITE REFLECTANCE VALUES

Well Name: WINDERMERE-2
Depth: 2955-2960

Sorted List

0.62	0.87
0.67	0.91
0.69	0.93
0.71	
0.76	
0.76	
0.79	
0.81	
0.82	
0.84	

Number of values= 13

Mean of values 0.78
Standard Deviation 0.09

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

62-64	*
65-67	*
68-70	*
71-73	*
74-76	**
77-79	*
80-82	**
83-85	*
86-88	*
89-91	*
92-94	*

VITRINITE REFLECTANCE VALUES

Well Name: WINDERMERE-2
Depth: 3015 m

Sorted List

0.72	0.91
0.74	0.92
0.75	0.95
0.80	0.97
0.80	0.97
0.82	0.97
0.82	1.04
0.85	
0.87	
0.91	

Number of values= 17

Mean of values 0.87
Standard Deviation 0.09

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

72-74	**
75-77	*
78-80	**
81-83	**
84-86	*
87-89	*
90-92	***
93-95	*
96-98	***
99-101	
102-104	*

VITRINITE REFLECTANCE VALUES

Well Name: WINDERMERE-2
Depth: 3245-3250 m

Sorted List

0.66	0.82
0.70	0.82
0.72	0.87
0.73	0.90
0.74	0.91
0.76	
0.76	
0.79	
0.80	
0.81	

Number of values= 15

Mean of values 0.79
Standard Deviation 0.07

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

66-68	*
69-71	*
72-74	***
75-77	**
78-80	**
81-83	***
84-86	
87-89	*
90-92	**

VITRINITE REFLECTANCE VALUES

Well Name: WINDERMERE-2
Depth: 3335-3340 m

Sorted List

0.77	1.07
0.82	
0.84	
0.87	
0.88	
0.89	
0.89	
0.90	
1.03	
1.04	

Number of values= 11

Mean of values 0.91
Standard Deviation 0.09

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

77-79	*
80-82	*
83-85	*
86-88	**
89-91	***
92-94	
95-97	
98-100	
101-103	*
104-106	*
107-109	*

VITRINITE REFLECTANCE VALUES

Well Name: WINDERMERE-2
Depth: 3505-3510 m

Sorted List

0.69	0.75	0.83	0.88
0.70	0.76	0.84	0.90
0.71	0.76	0.84	0.91
0.71	0.78	0.85	0.91
0.72	0.81	0.86	
0.73	0.81	0.87	
0.74	0.81	0.87	
0.75	0.81	0.87	
0.75	0.83	0.87	
0.75	0.83	0.88	

Number of values= 34

Mean of values 0.81
Standard Deviation 0.07

HISTOGRAM OF VALUES
Reflectance values multiplied by 100

69-71	****
72-74	***
75-77	******
78-80	*
81-83	*******
84-86	****
87-89	******
90-92	***

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APPENDIX 3

PHOTOMICROGRAPHS OF DISPERSED ORGANIC MATTER, WINDERMERE -2

PE907892

This is an enclosure indicator page.
The enclosure PE907892 is enclosed within the container PE902151 at this location in this document.

The enclosure PE907892 has the following characteristics:

ITEM_BARCODE =	PE907892
CONTAINER_BARCODE =	PE902151
NAME =	SEM Core Photograph
BASIN =	OTWAY
PERMIT =	PEP 111
TYPE =	WELL
SUBTYPE =	CORE_PHOTO
DESCRIPTION =	SEM Core Photographs Plate 1 & 2 (Enclosure from Appendix G--Petrological Report--of Well Completion Report vol.2) for Windermere-2
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	9/11/89
W_NO =	W992
WELL_NAME =	Windermere-2
CONTRACTOR =	Amdel
CLIENT_OP_CO =	Minora Resources NL

(Inserted by DNRE - Vic Govt Mines Dept)

DEPT. NAT. RES & ENV
PE907892

amdel

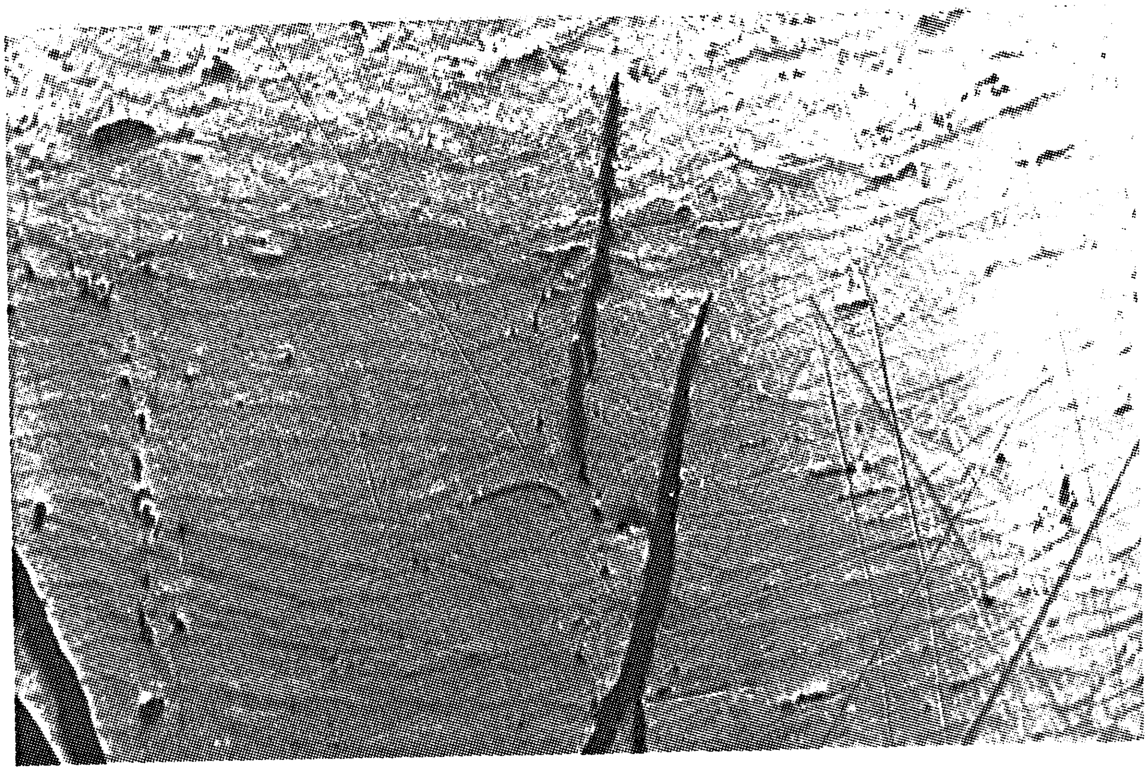

Plate 1: 3060 - 3065 m **Reflected Light**
Exsudatinite (primary oil; black veins) occurs with suberinite (moderate grey) in this vitrinite (light grey) rich shale.
Field Dimension: 0.26 x 0.18 mm

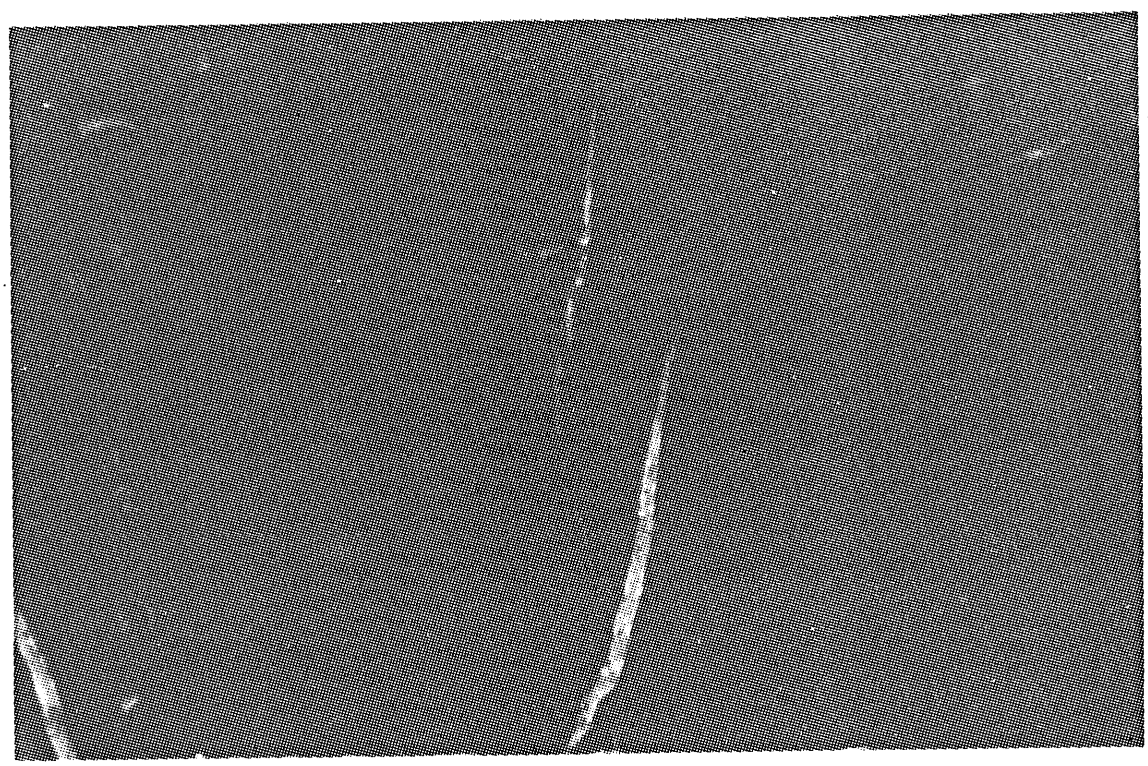

Plate 2: Same field as above **Fluorescence Mode**
Exsudatinite and liptodetrinite have a moderate orange fluorescence whilst suberinite fluorescence is notably "dull".

PE907893

This is an enclosure indicator page.
The enclosure PE907893 is enclosed within the container PE902151 at this location in this document.

The enclosure PE907893 has the following characteristics:

ITEM_BARCODE =	PE907893
CONTAINER_BARCODE =	PE902151
NAME =	SEM Core Photograph
BASIN =	OTWAY
PERMIT =	PEP 111
TYPE =	WELL
SUBTYPE =	CORE_PHOTO
DESCRIPTION =	SEM Core Photographs Plate 3 & 4 (Enclosure from Appendix G--Petrological Report--of Well Completion Report vol.2) for Windermere-2
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	9/11/89
W_NO =	W992
WELL_NAME =	Windermere-2
CONTRACTOR =	Amdel
CLIENT_OP_CO =	Minora Resources NL

(Inserted by DNRE - Vic Govt Mines Dept)

amdel

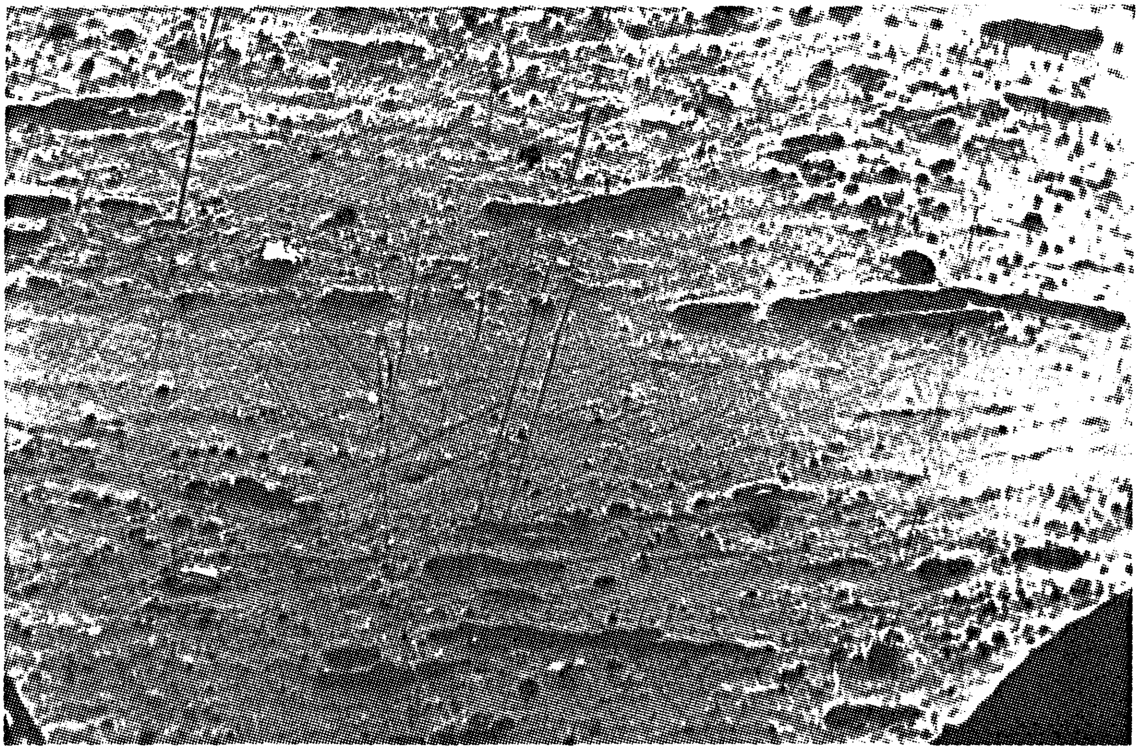

Plate 3: 3060 - 3065 m **Reflected Light**
This is a more typical field of view of this vitrinite rich coal.
Field Dimension: 0.26 x 0.18 mm

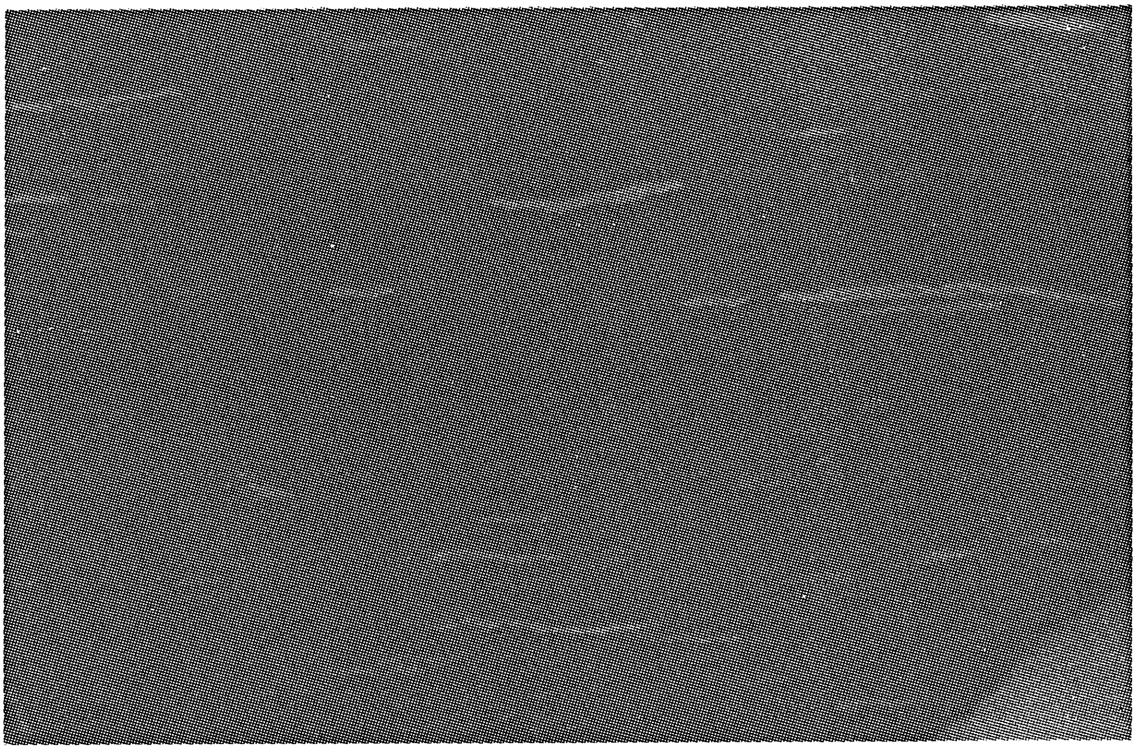

Plate 4: Same field as above **Fluorescence Mode**
The majority of the exinite in this coal consists of sporinite and liptodetrinite.

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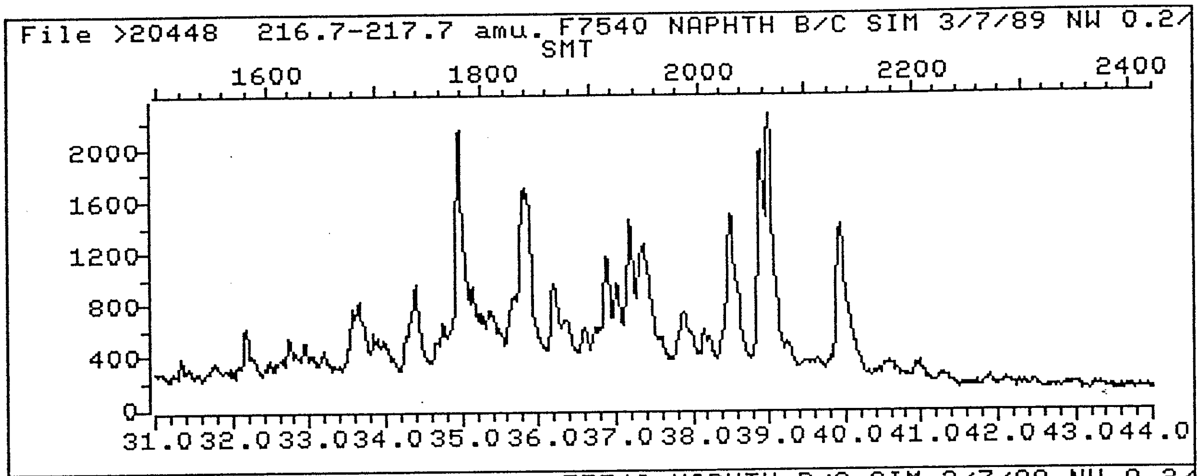
APPENDIX 4

OTHER MASS FRAGMENTOGRAMS OF NAPHTHENES IN OIL

FROM WINDERMERE -2, DST 2A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SMT
1600 1800 2000 2200 2400
0 400 800 1200 1600 2000
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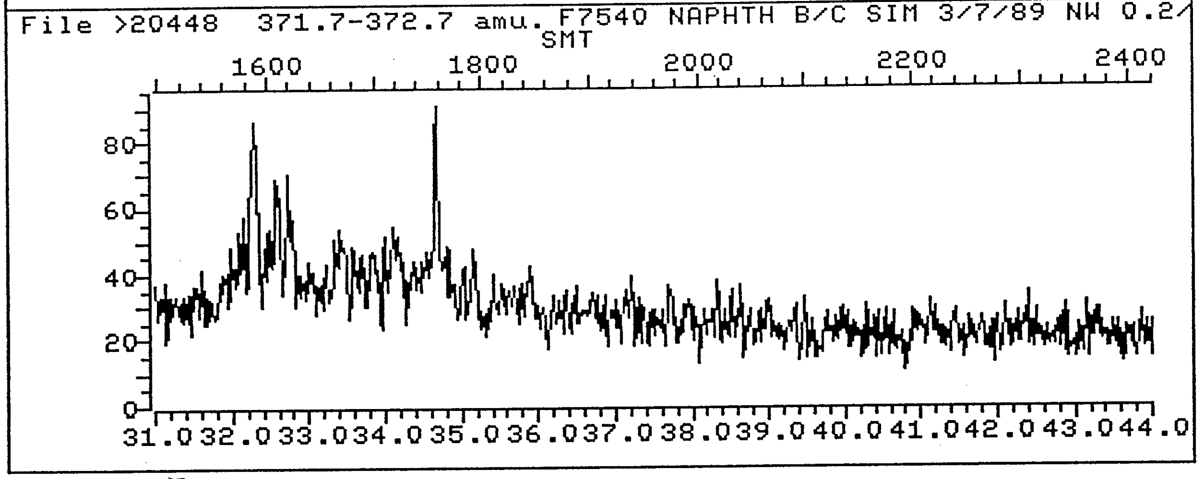
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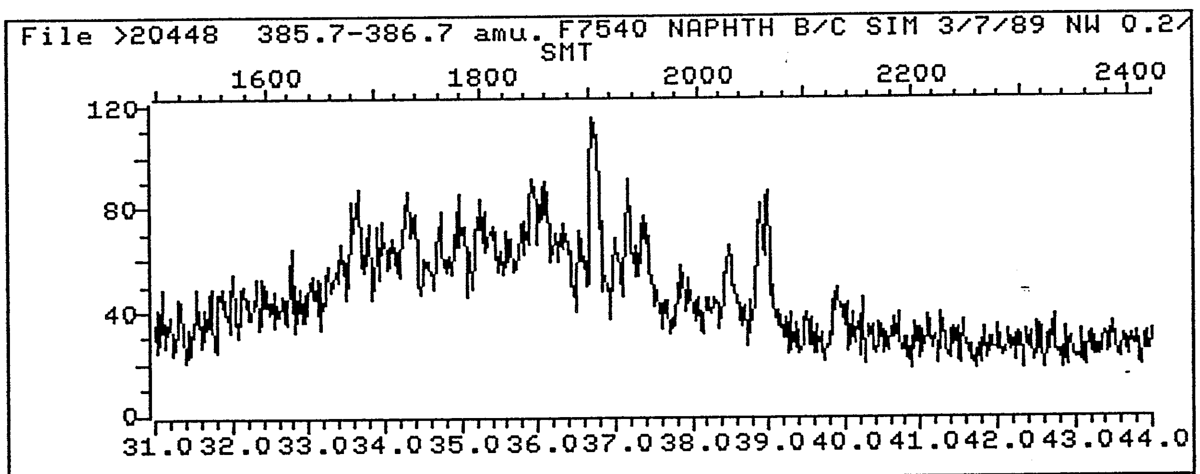
0 20 40 60 80
31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0 41.0 42.0 43.0 44.0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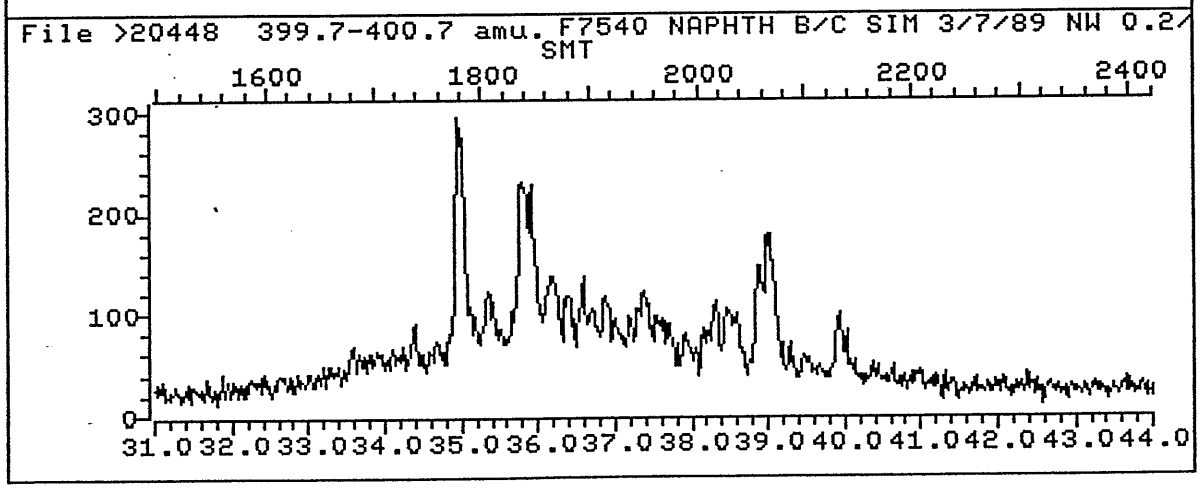
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0 100 200 300
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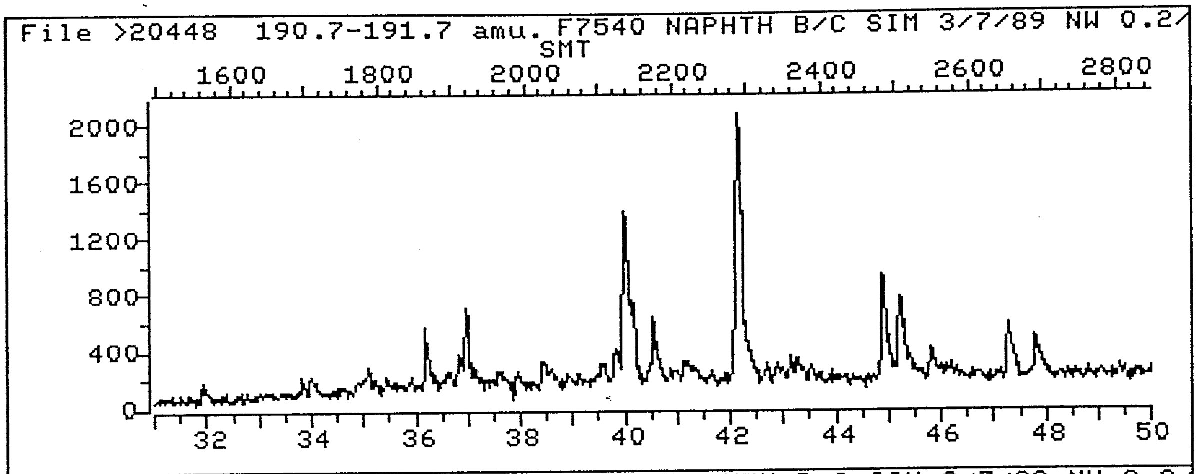
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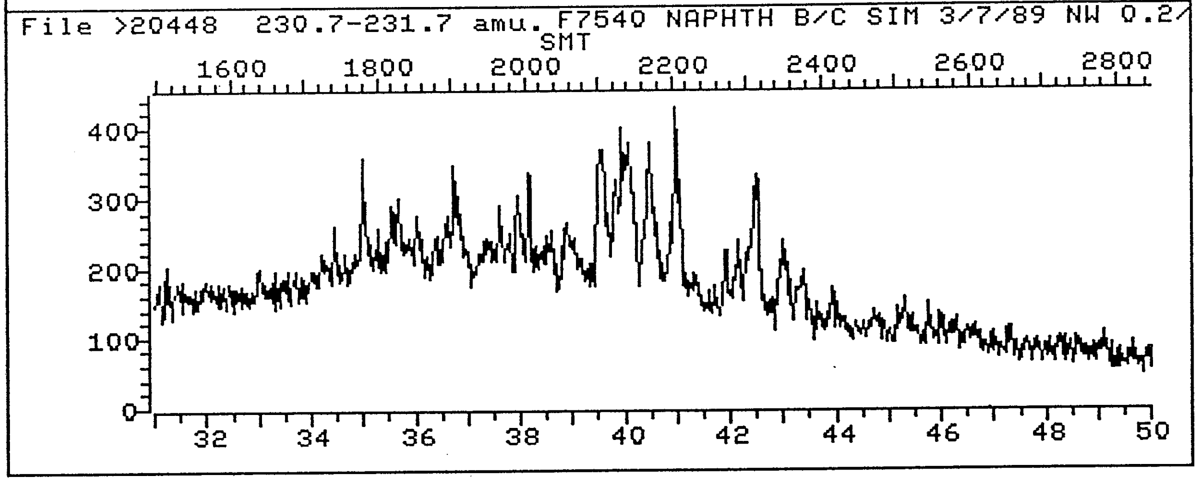
2000 1600 1200 800 400 0
32 34 36 38 40 42 44 46 48 50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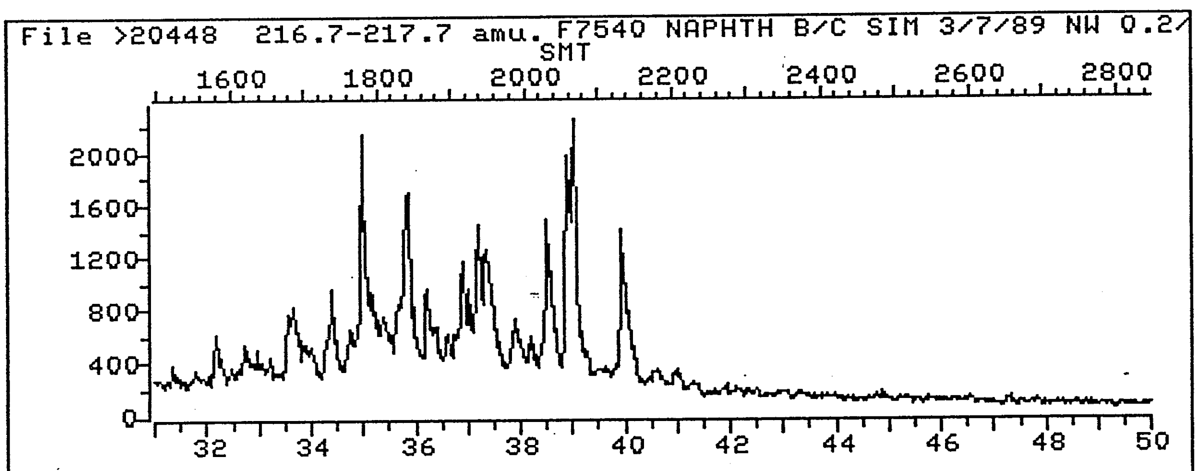
32 34 36 38 40 42 44 46 48 50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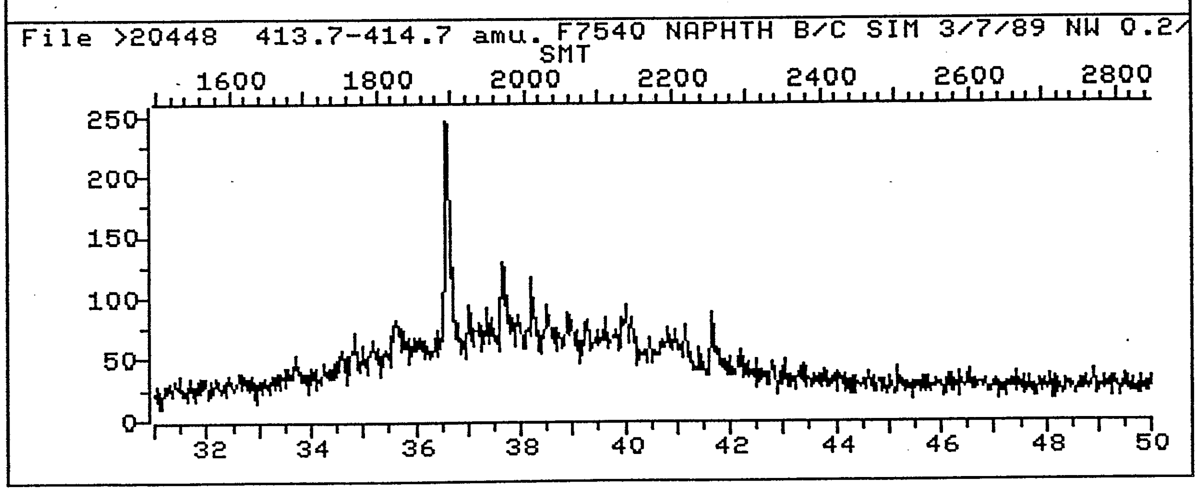
32 34 36 38 40 42 44 46 48 50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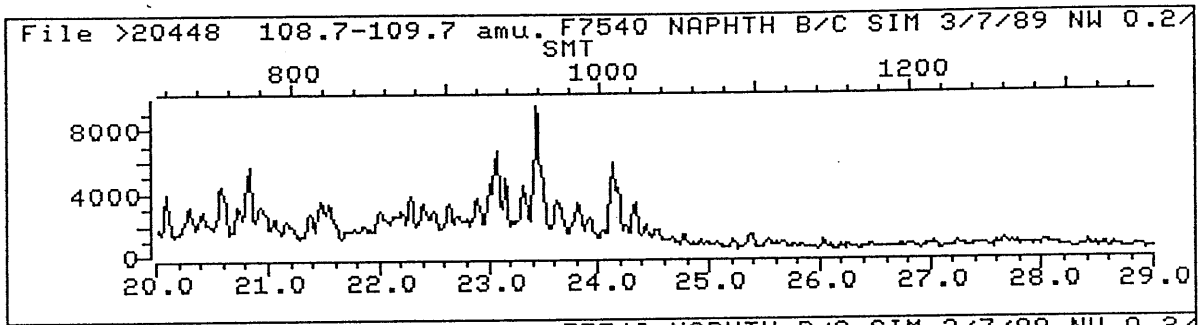
32 34 36 38 40 42 44 46 48 50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8000 4000 0
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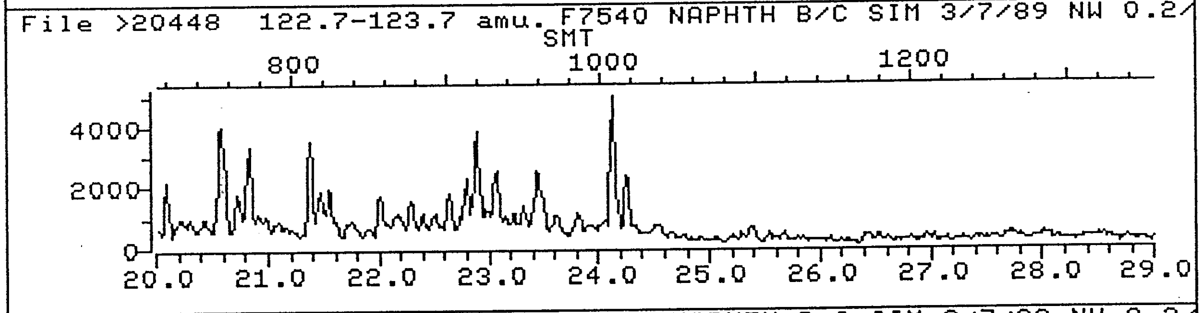
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4000 2000 0
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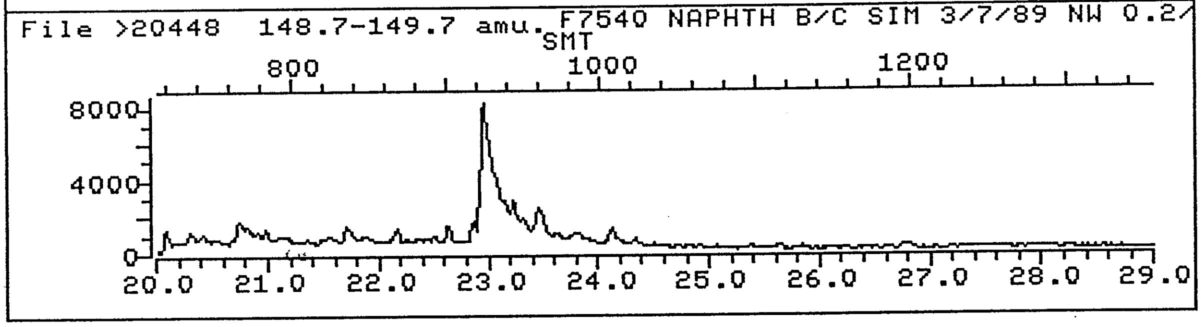
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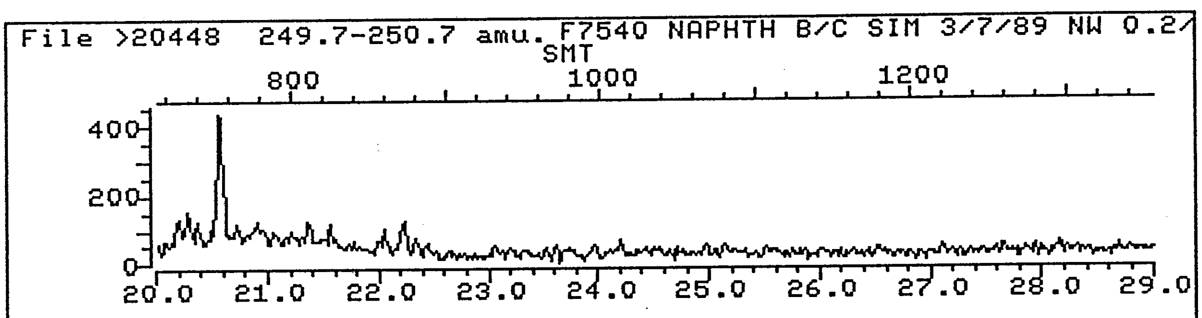
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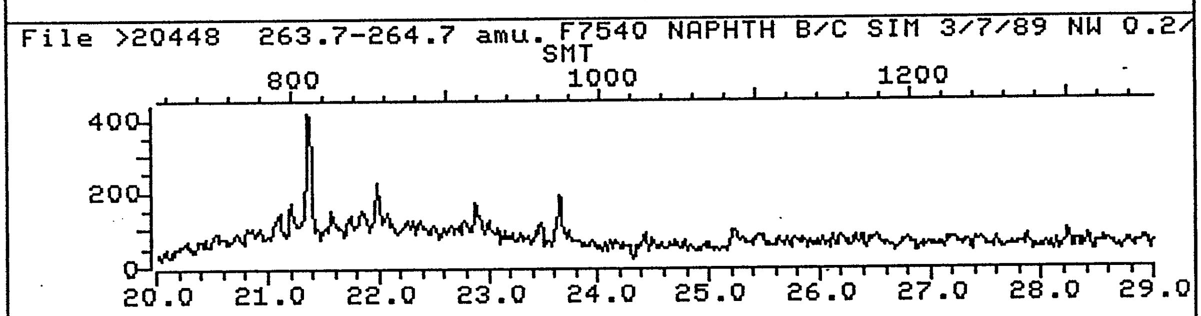
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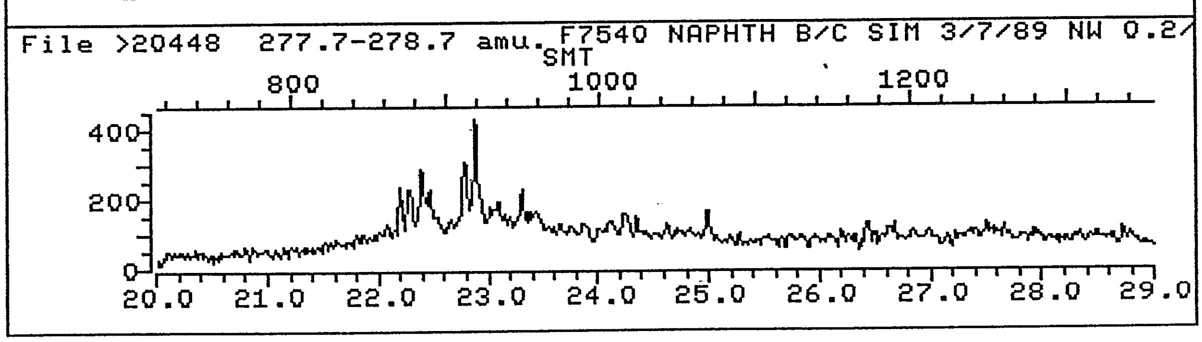
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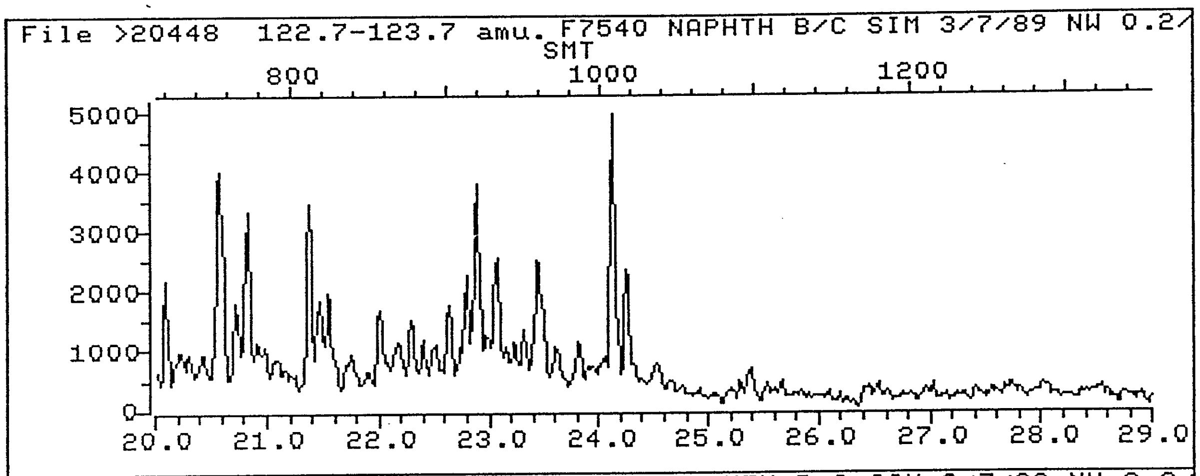
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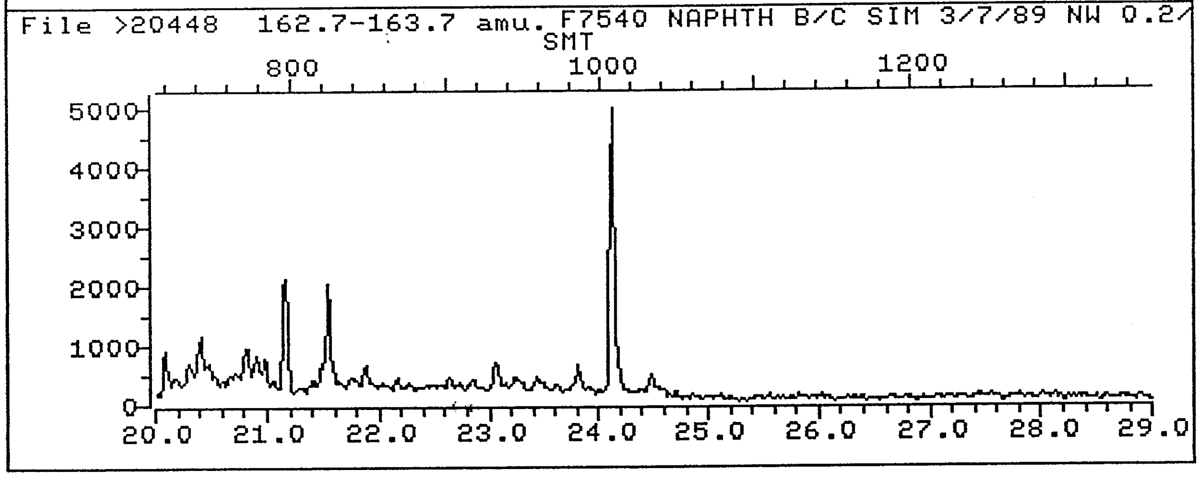
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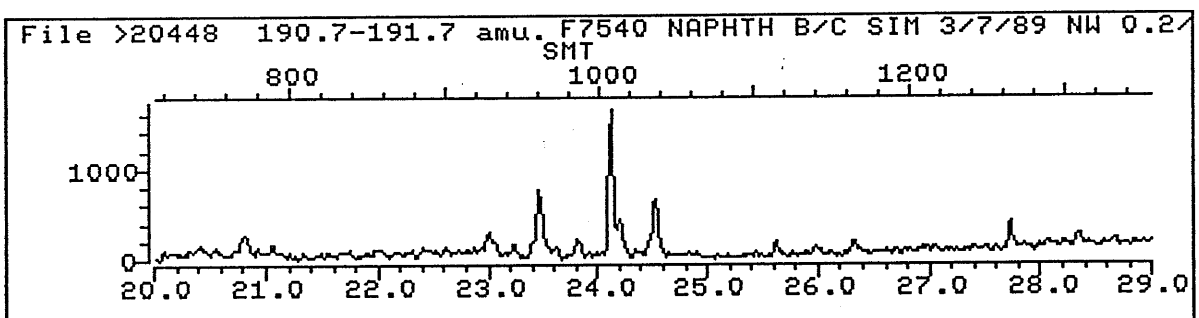
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1000 0
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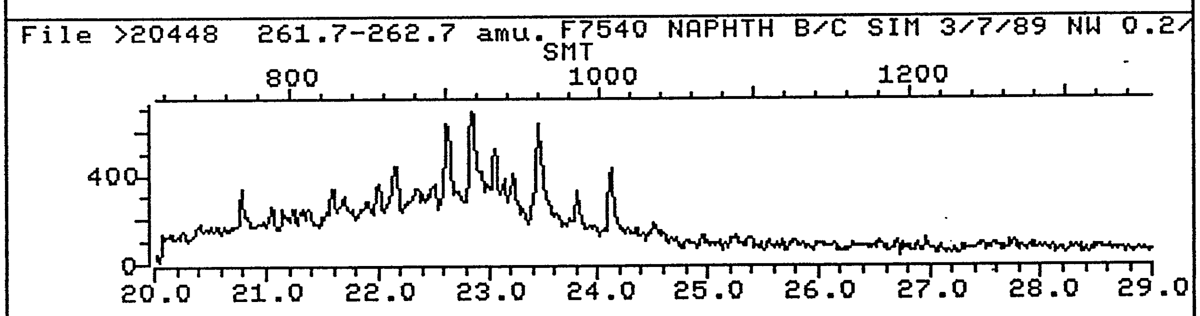
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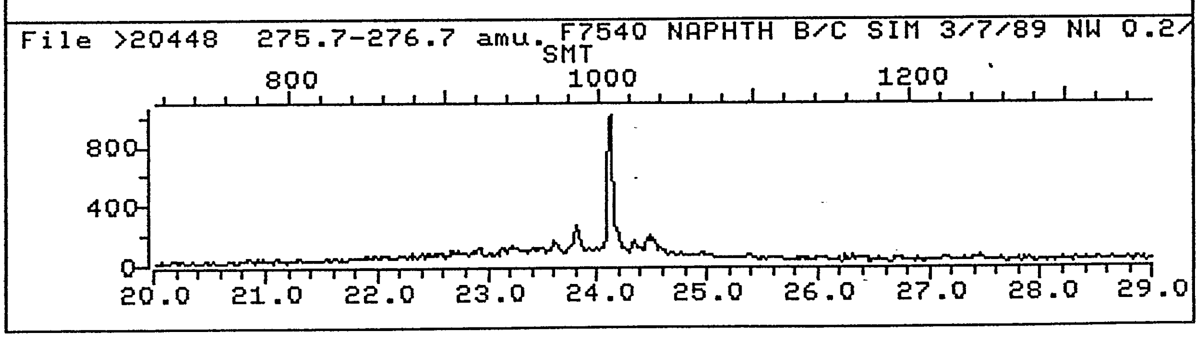
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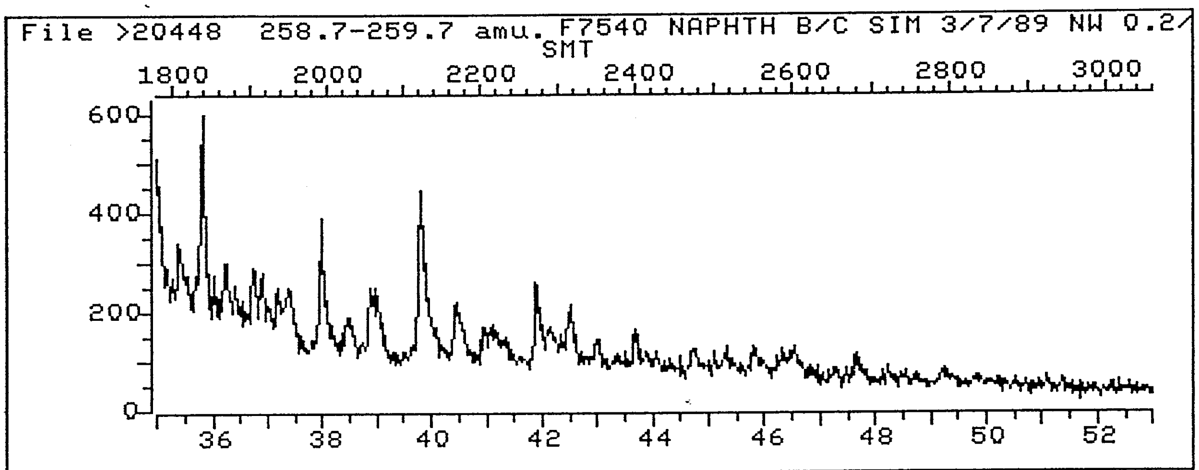
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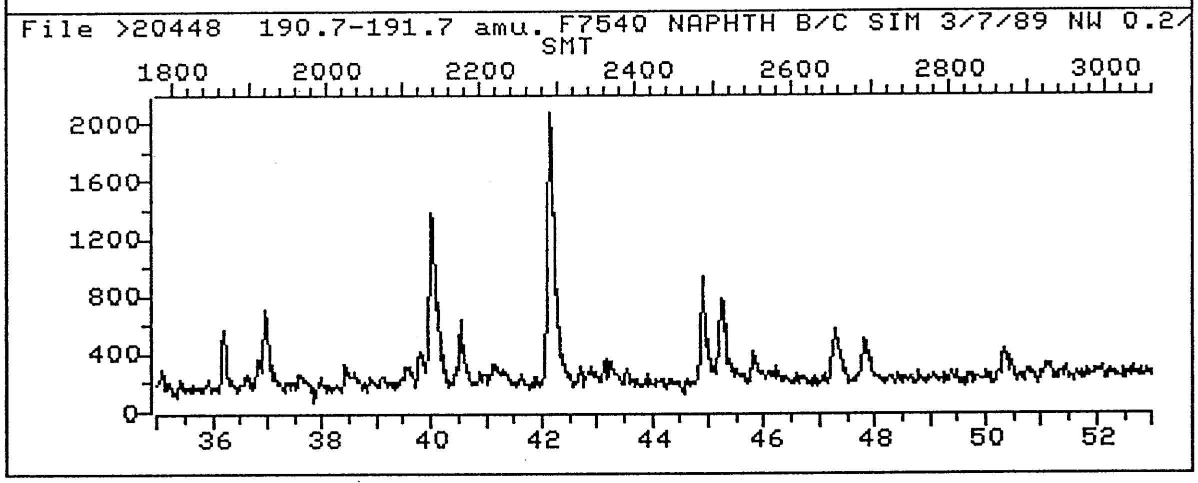
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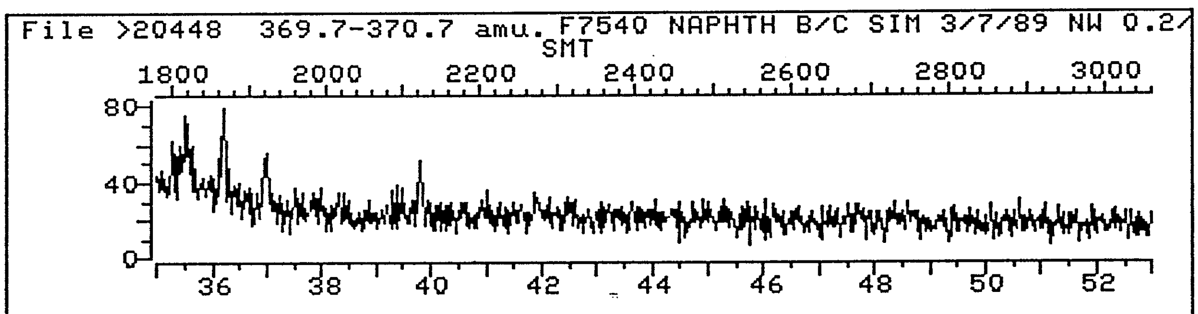
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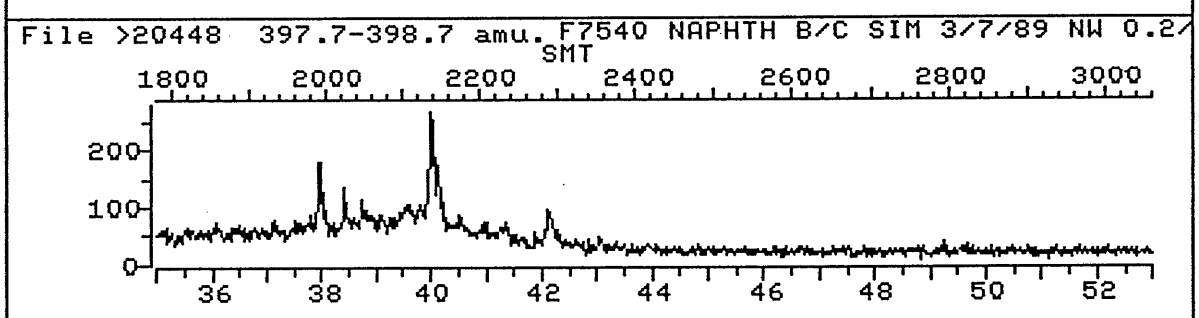
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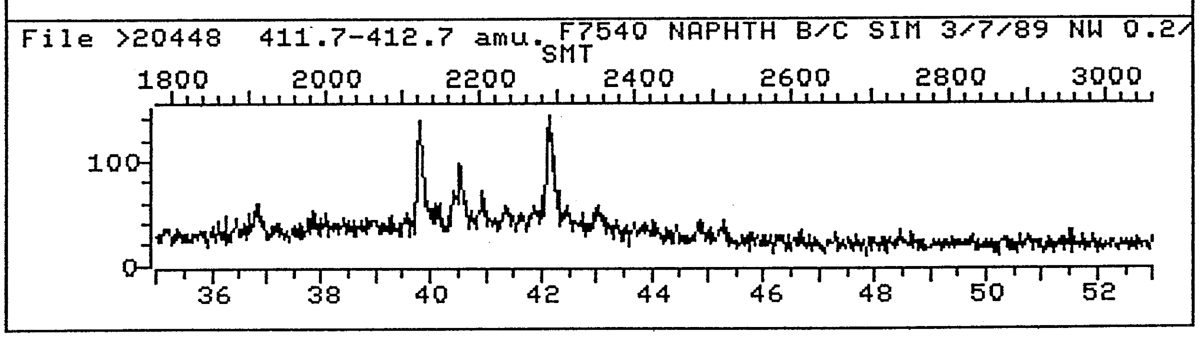
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SMT
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100 0
36 38 40 42 44 46 48 50 52

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APPENDIX 5

WATER ANALYSIS, WINDERMERE -2, DST 1

Water Analysis Report   Job No. 2281/89   Method W2/1 Page W1

Sample ID. WINDERMERE 2 DST 1

Chemical Composition

		mg/L	me/L
Cations			
Calcium	(Ca)	3877.0	193.463
Magnesium	(Mg)	2.0	0.165
Sodium	(Na)	3172.0	137.973
Potassium	(K)	1322.0	33.811
Anions			
Hydroxide	(OH)		
Carbonate	(CO3)		
Bi-Carbonate	(HCO3)	322.8	5.291
Sulphate	(SO4)	128.0	2.665
Chloride	(Cl)	12750	359.145
Nitrate	(NO3)	0.6	0.010

Other Analyses

Reaction - pH	7.0
Conductivity (E.C) (micro -S/cm at 25°C)	33400
Resistivity Ohm.M at 25°C	0.299

Derived Data

	mg/L
Total Dissolved Solids	
A. Based on E.C.	24350
B. Calculated (HCO3=CO3)	21413
Total Hardness	9689
Carbonate Hardness	290
Non-Carbonate Hardness	9399
Total Alkalinity	290
(Each as CaCO3)	

Totals and Balance

Cations (me/L)	365.4	Diff=	1.70
Anions (me/L)	367.1	Sum =	732.52

ION BALANCE (Diff*100/Sum) = 0.23%

Sodium / Total Cation Ratio 37.8%

Remarks

RECOVERED 299M OF MUD&MUDDY WATER

Note: mg/L = Milligrams per litre
me/L = MilliEqivs.per litre

Name: MR B.WATSON
Address: PETROLEUM SERVICES
AMDEL LTD
ADELAIDE

Date Collected 20-3-89
Date Received 12-4-89
Collected by D.A.SHORT

Formation HEATHFIELD MBR
Type
Point SAMPLE CHAMBER
Time
Interval 1775.2-1802.3M
Geologist
Depth

APPENDIX L

APPENDIX L

PALYNOLOGY

PALYNOLOGY OF MINORA WINDERMERE-2

ONSHORE OTWAY BASIN, VICTORIA

BY

ROGER MORGAN
Box 161
MAITLAND 5573
(088) 322795
Fax (088) 322658

for MINORA RESOURCES June. 1989

PALYNOLOGY OF MINORA WINDERMERE-2

ONSHORE OTWAY BASIN, VICTORIA

BY

ROGER MORGAN

CONTENTS PAGE

I SUMMARY

1000-20m (cutts) : upper T.pachyexinus Zone : Santonian: nearshore marine (I.cretaceum Zone) : immature (minor Otway Group components at 1010-20m presumed reworked)

1090-1200m (cutts) : P.pannosus Zone : Late Albian: probably non-marine : marginally mature

1290-1490m (cutts) : upper C.paradoxa Zone : mid Albian : non-marine : marginally mature

1650m (cutts)-1748 (core) : lower C.paradoxa Zone : mid Albian : non-marine : early mature

1825m (cutts)-2007m (swc) : C.striatus Zone : early Albian : non-marine : early mature

2240m (swc)-3290m (cutts)(3200m swc) : C.hughesi Zone : Aptian : non-marine : mature 2240-3200m, peak mature 3245-3290m

3335m (cutts)-3570m (cutts) : F.wonthaggiensis Zone : late Neocomian : non-marine, some lacustrine influence : peak mature.

Breakdown is fairly straight forward; cuttings are generally fairly clean of downhole contamination. Sampled section comprised a condensed Sherbrook Group, normal Eumeralla Formation and a thin section of Crayfish Formation. Top Crayfish unconformity is expected in or near the gap 3290 to 3335m. The intra Eumeralla unconformity is expected in or near the gap 1748-1825m.

II INTRODUCTION

Ed Kopson of Minora Resources submitted 25 samples (14 cuttings, 10 swcs and 1 conventional core) after well completion. These were in addition to 7 "hot" cuttings samples submitted in 3 groups during drilling, to help locate top Crayfish Formation and therefore TD, ahead of the logs. Results were submitted as available and this report details the final interpretation of results from these samples.

Palynomorph occurrence date are shown as Appendix I and form the basis for the assignment of the samples to seven spore-pollen units of Santonian to late Neocomian age. The Cretaceous spore-pollen zonation is essentially that of Playford and Dettmann (1969), but has been significantly modified and improved by various authors since, and most recently discussed in Helby et al. (1987) as shown on figure 1.

Cretaceous dinoflagellates are seen in only a few samples, and are discussed within the recent zonation framework of Helby et al. (1987), as on figure 1.

Maturity data are generated in the form of Spore Colour Index and plotted in figure 2. The oil window corresponds to spore colours of light-mid brown (2.7) to dark brown (3.6) and vitrinite reflectances of 0.6% to 1.3% respectively. Geological factors and kerogen factors can modify this window in a minor way, and instrumental geochemistry offers more quantitative and repentable measurements.

	AGE		SPORE – POLLEN ZONES	DINOFLAGELLATE ZONES
Early Tertiary	Early Oligocene		P. tuberculatus	
	Late Eocene		upper N. asperus	P. comatum
			middle N. asperus	V. extensa
	Middle Eocene		lower N. asperus	D. heterophlycta
				W. echinosuturata
			P. asperopolus	W. edwardsii
				W. thompsonae
	Early Eocene		upper M. diversus	W. ornata
				W. waipawaensis
			middle M. diversus	
			lower M. diversus	W. hyperacantha
	Paleocene		upper L. balmei	A. homomorpha
			lower L. balmei	E. crassitabulata
				T. evittii
Late Cretaceous	Maastrichtian		T. longus	M. druggii
	Campanian		T. lillei	I.korojonense
			N. senectus	X. australis
	Santonian		T. pachyexinus	N. aceras
				I. cretaceum
				O. porifera
	Coniacian		C. triplex	
	Turonian			C. striatoconus
				P. infusorioides
	Cenomanian		A. distocarinatus	
Early Cretaceous	Albian	Late	P. pannosus	
		Middle	upper C. paradoxa	
		Early	lower C. paradoxa	
			C. striatus	
	Aptian		upper C. hughesi	
			lower C. hughesi	
	Barremian		F. wonthaggiensis	
	Hauterivian			
	Valanginian		upper C. australiensis	
	Berriasian		lower C. australiensis	
Juras.	Tithonian		R. watherooensis	

FIGURE 1 ZONATION FRAMEWORK

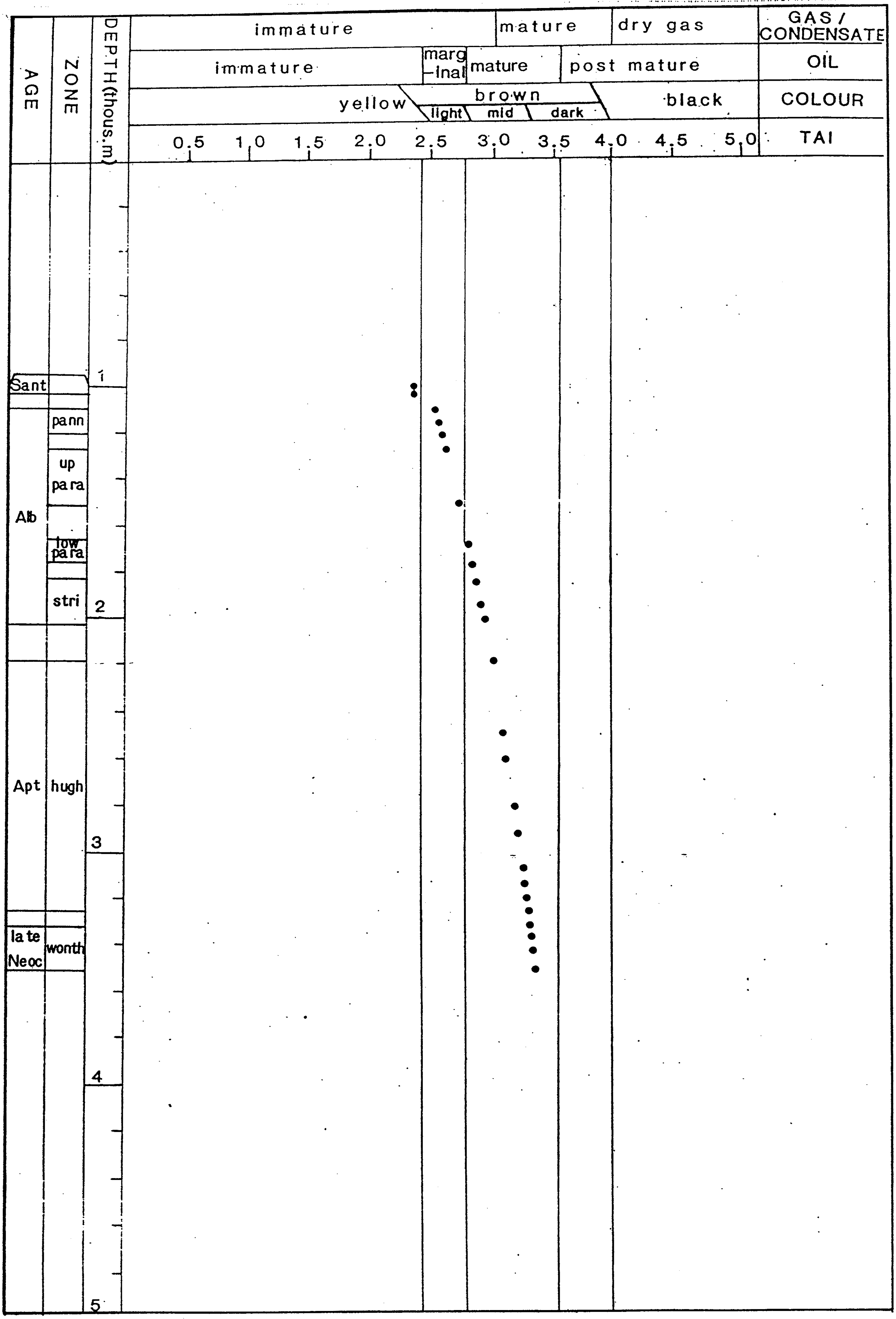


FIGURE 2 MATURITY PROFILE, WINDERMERE 2

III PALYNOSTRATIGRAPHY

A. 1000-20m (cutts) : upper T.pachyexinus Zone (I.cretaceum Zone)

These two cuttings samples are assigned to the Tricolporites pachyexinus Zone of Santonian age on the presence of T.pachyexinus (=T.apoxyexinus) without younger indicators. The upper half of the zone is clearly indicated by the scarcity of Amosopollis cruciformis and the dinoflagellate data. Cuticle and inertinite dominate the residues and Proteacidites spp. are the dominant spore-pollen taxa. Age significant taxa include Australopollis obscuris, Clavifera triplex, Ornamentifera sentosa, Phyllocladidites mawsonii and Tricolpites confessus. Minor Paleogene caving (Nothofagidites emarcidus) is seen in both samples. Minor Albian Otway Group reworking (A.spinulosus, C.paradoxa) and minor Permian and Triassic reworking are seen at 1010-20m only.

Dinoflagellates comprise 50 % of palynomorphs and are quite diverse (15-20) species). Nearshore environments are therefore indicated. Heterosphaeridium heteracanthum is dominant, but the co-occurence of Isabelidinium belfastense with I.cretaceum, Odontochitina porifera and Hexagonifera glabra indicates the upper part of the I.cretaceum Dinoflagellate Zone.

Palynomorphs are colourless, indicating immaturity for hydrocarbon generation.

These features are normally seen in the marine Sherbrook Group.

B. 1090-1200m (cutts) : P.pannosus Zone

Assignment to the Phimopollenites pannosus Zone is indicated at the top by youngest Coptospora paradoxa in situ and Pilosisporites grandis, along with a vast influx of spores and pollen. At the base, oldest P.pannosus indicates the assignment, but this may be slightly too low, if caving has occurred, Caving in these 3 cuttings samples appears to be minor, with caved Late Cretaceous taxa comprising only about 2% of the assemblage. The assemblage is dominated by Cyathidites and Stereisporites with high diversity. Trace Triassic reworking was seen at 1150-60m only.

Non-marine environments are considered most likely, as all of the marine elements are probably caved from the late Cretaceous. The abundant and diverse spores and pollen, and high cuticle and tracheid contents also support a non-marine provenance.

Light brown spore colours indicate marginal maturity for oil, but immaturity for gas/condensate. N.P. These features are normally seen in the topmost Eumeralla Formation.

C. 1290-1490m (cutts) : upper C.paradoxa Zone

Assignment to the upper Coptospora paradoxa Zone is indicated at the top by the absence of P.pannosus and youngest consistent P.grandis. The base is defined by oldest P.grandis and the absence of older markers. Common taxa are Cyathidites and Stereisporites antiquasporites. Foraminisporis *asymmetricus* and *Crybelosporites striatus* are consistent at 1290-1300m (cutts), and *Triporoletes radiatus* is consistent at 1480-90m (cutts). Late Cretaceous caving is minor, less than 1%.

Non-marine environments are indicated by the dominant cuticle and tracheid, common and diverse spores and pollen, and absence of in situ marine indicators. Minor lacustrine influence is suggested by the freshwater algal forms *Botryococcus* at 1480-90m and *Schizosporis* at 1290-1300m.

Light brown spore colours indicate marginal maturity for oil, and immaturity for gas/condensate.

These features are usually seen in the mid Eumeralla Formation.

D. 1650 (cutts)-1748m (core) : lower *C.paradoxa* Zone

Assignment to the lower *Coptospora paradoxa* Zone is indicated at the top by youngest *Coptospora striata* (1650-60m, cutts) and youngest *Dictyotosporites speciosus* (1748m, core 1). *Cyathidites* and *Falcisporites* are common in both samples, with *Cicatricosisporites australiensis* and *Triporoletes radiatus* consistent at 1650-60m (cutts). Only a trace of Late Cretaceous caving was seen.

Non-marine environments are indicated by the dominant cuticle and tracheid fragments, the common and diverse spores and pollen, and the absence of in situ marine indicators.

Light to mid brown spore colours indicate early maturity for oil generation and early marginal maturity for gas/condensate.

These features are normally seen at the base of the mid Eumeralla Formation, directly above the mid Eumeralla unconformity.

E. 1825m (Cutts)-2007m (swc) : C.striatus Zone

These three samples are assigned to the Crybelosporites striatus Zone at the top on the absence of younger indicators and at the base on oldest C.striatus. Youngest consistent Pilosisporites spp. (P.notensis and P.parvispinosus) occur at 1825-30m (cutts). Cyathidites spp. and Cicatricosisporites spp. are common throughout, with Stereisporites antiquasporites also common at 1825-30m. Cuticle and spores and pollen dominate the residues, and amorphous sapropel at 1825-30m suggests good source potential. Trace quantities of Late Cretaceous forms are caved into the cuttings.

Non-marine environments are indicated by the lack of marine taxa, the common and diverse spores and pollen, and common plant debris.

Light to mid brown spore colours indicate early maturity for oil generation and early marginal maturity for gas/condensate.

These features are normally seen in the mid Eumeralla Formation.

F. 2240m (swc)-3290m (cutts) : C.hughesi Zone

These ten samples (3 cuttings and 7 swcs) are assigned to the Cyclosporites hughesi Zone at the top on youngest C.hughesi and at the base on the lack of older indicators. Assignment to 3200m at least is confirmed by oldest P.notensis in the deepest swc. Within the interval, youngest Cooksonites variabilis at 2526m (swc) implies that 2240m belongs to the upper C.hughesi Zone and 2526-3290 to the lower C.hughesi Zone. These thicknesses appear unusual, and reworking of C.variabilis may be responsible, causing an apparently thicker lower C.hughesi Zone at the expense of the upper C.hughesi Zone. Alternatively, the subdivision may be valid : log correlation may throw light on the matter. Also within the interval, oldest consistent F.asymmetricus (2240m) and acmes of P.notensis (2930 m and 3167-3200m) may have correlative potential. Cyathidites, and Falcisporites tend to be the most common taxa throughout.

Non-marine environments are indicated by the absence of saline indicators, dominant spore/pollen with subordinate plant debris (tracheid and cuticle).

Mid brown spore colours indicate maturity for oil throughout, with mid to dark brown colours below 3200m indicating peak maturity for oil generation. The section 2240 to 2800m is marginally mature for gas/condensate, with 2800m-3200m mature for gas/condensate.

These features are normally seen in the lower Eumeralla Formation including any basal Eumeralla sands.

G. 3335m (cutts)-3570m (cutts) : F.wonthaggiensis Zone

Assignment to the Foraminisporis wonthaggiensis Zone is indicated at the top by youngest Microfasta evansii. The usual base range criteria cannot be used since no sidewall cores were recovered below 3200m. The younger taxa are seen in these cuttings but are presumed caved. At least some specimens are obviously caved, due to their lighter spore colours. The base of the interval is not clearly defined, but M.evansii is consistent to the base. Regionally, M.evansii is very rarely seen in the next older zone, the C.australiensis Zone. The whole interval is therefore assigned to the F.wonthaggiensis Zone.

Non-marine environments with some lacustrine influence is indicated by the common and diverse spores and pollen, abundant plant debris, and lack of saline indicators.

Peak maturity for oil is indicated by the mid-dark brown spore colours, which also indicate maturity for gas/condensate generation.

These features are usually seen in the Crayfish or Pretty Hill Formation.

IV CONCLUSIONS

A. The sampled section appears to consist of an incomplete and condensed Sherbrook Group, a thick and complete Eumeralla Formation, and a short drilled section of Crayfish Formation. Three major regional unconformities appear to be present at the mid Cretaceous (in the gap 1020 to 1090m), intra Eumeralla (in the gap 1748 to 1825m) and top Crayfish (in the gap 3290 to 3335m. Caving or reworking may have confused interpretation somewhat, and these unconformities may be nearby and not exactly in these gaps.

B. The section appears to be peak mature for oil below about 3200m.

V REFERENCES

Dettmann, M.E. and Playford, G. (1969) Palynology of the Australian Cretaceous : a review In Stratigraphy and Palaeontology. Essays in honour of Dorothy Hill K.S.W. Campbell Ed. ANU Press, Canberra 174-210.

Helby, R.J., Morgan, R.P. and Partridge, A.D. (1987) A palynological zonation of the Australian Mesozoic Ass. Australas. Palaeontols. Mem 4, 1-94.

PE907894

This is an enclosure indicator page.
The enclosure PE907894 is enclosed within the container PE902151 at this location in this document.

The enclosure PE907894 has the following characteristics:

ITEM_BARCODE = PE907894
CONTAINER_BARCODE = PE902151
NAME = Range Chart
BASIN = OTWAY
PERMIT = PEP 111
TYPE = WELL
SUBTYPE = DIAGRAM
DESCRIPTION = Range Chart of Graphic Abundances by Lowest Appearances (Enclosure from Appendix L--Palynology--of Well Completion Report vol.2) for Windermere-2
REMARKS =
DATE_CREATED =
DATE_RECEIVED = 9/11/89
W_NO = W992
WELL_NAME = Windermere-2
CONTRACTOR =
CLIENT_OP_CO = Minora Resources NL

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX M

APPENDIX M

WELL LOCATION SURVEY PLAN

PAUL CROWE
LAND SURVEYORS

Paul D. Crowe, B. App. Sci. (Surv.), L. S., M.I.S.

64 Thompson Street,
HAMILTON 3300
Telephone (055) 72 4795

56 Kepler Street,
WARRNAMBOOL 3280
Telephone (055) 61 1500

April 6, 1989.

Hamilton office

Attention: Mr. Bruce McElhinney,
Minora Resources N.L.
55 St. Georges Terrace,
Perth. 6000.

Dear Bruce,

Re: Windermere No. 2.

Following instructions from Mr. Juris Ozolins, I have carried out a survey to confirm the actual location of the Windermere No. 2 Well.

Please find enclosed a plan showing the connections from existing permanent marks.

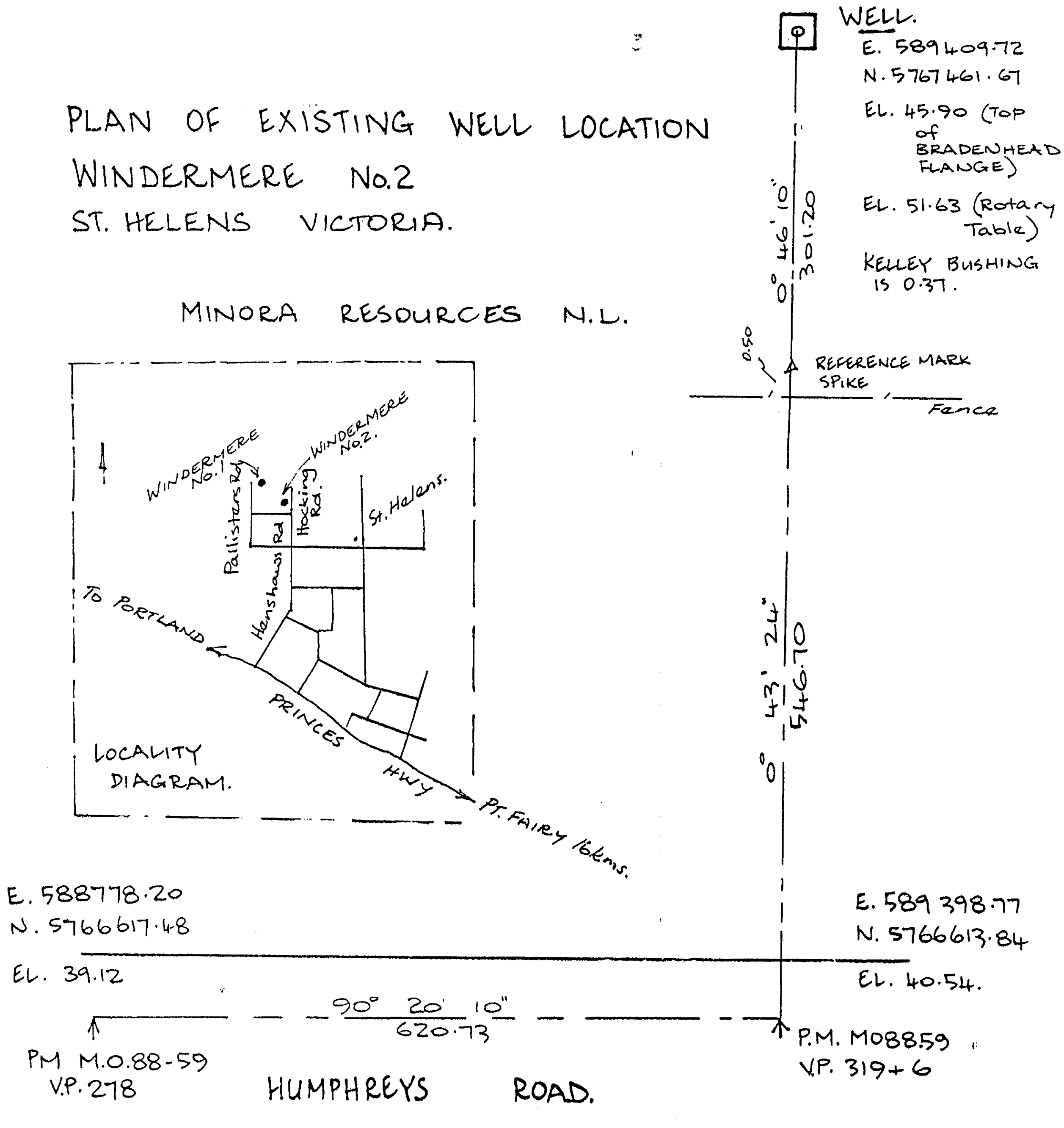
Co-ordinates and elevations are indicated on the Plan.

Yours faithfully,

PAUL D. CROWE.

PLAN OF EXISTING WELL LOCATION
WINDERMERE No.2
ST. HELENS VICTORIA.

MINORA RESOURCES N.L.



PAUL CROWE
LAND SURVEYORS
64 THOMPSON ST.
HAMILTON 3300
Ph. 055-724795

30-3-1989

APPENDIX N

APPENDIX N

WELL VELOCITY SURVEY

Velocity Data

WELL VELOCITY SURVEY

WINDERMERE #2

PEP 111

VICTORIA

for

MINORA RESOURCES NL

recorded by

VELOCITY DATA PTY. LTD.

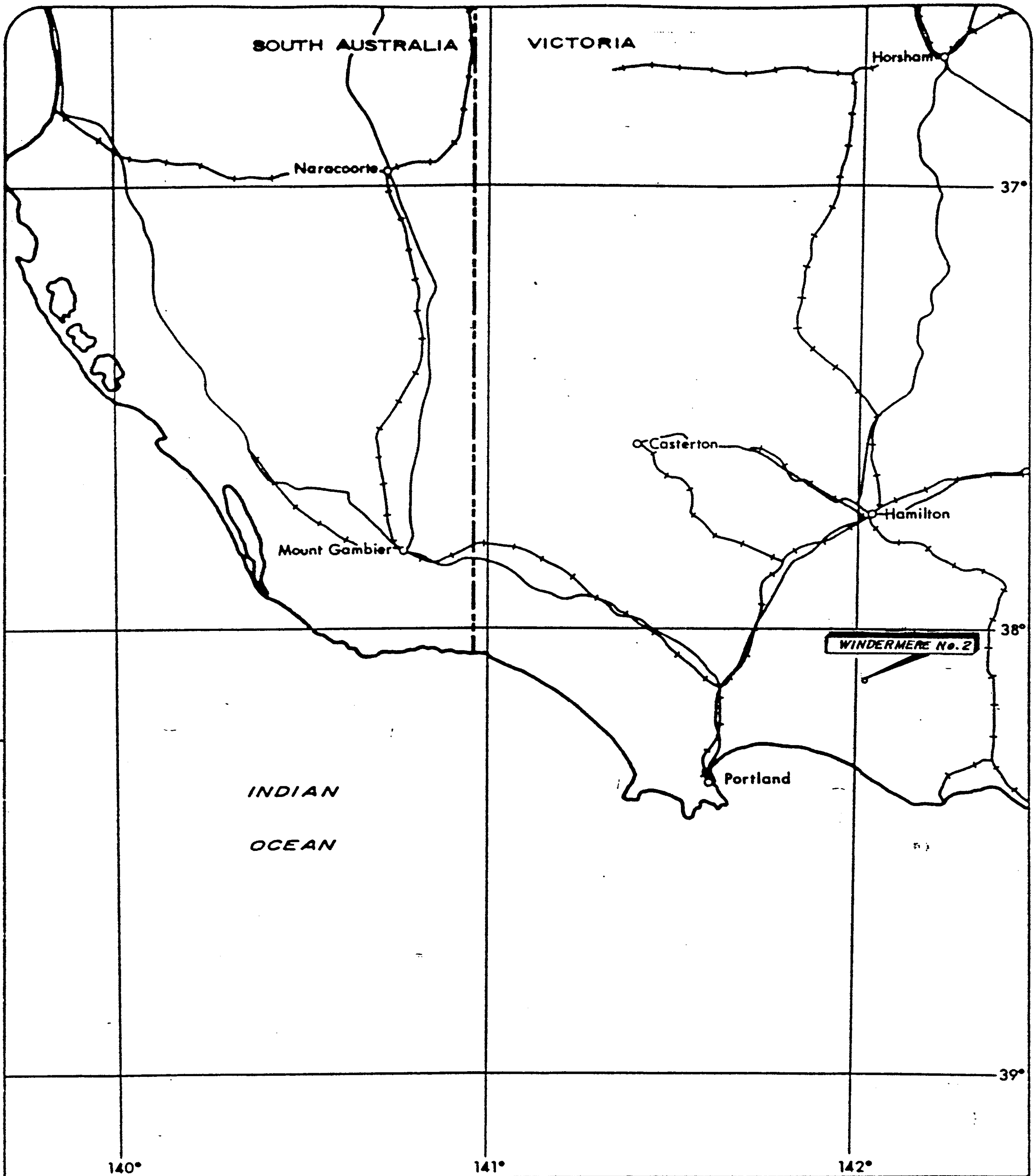
processed by

VELSEIS PTY LTD

Integrated Seismic Technologies

Brisbane, Australia
June 28, 1989.

CONTENTS



WINDERMERE #2

MINORA RESOURCES

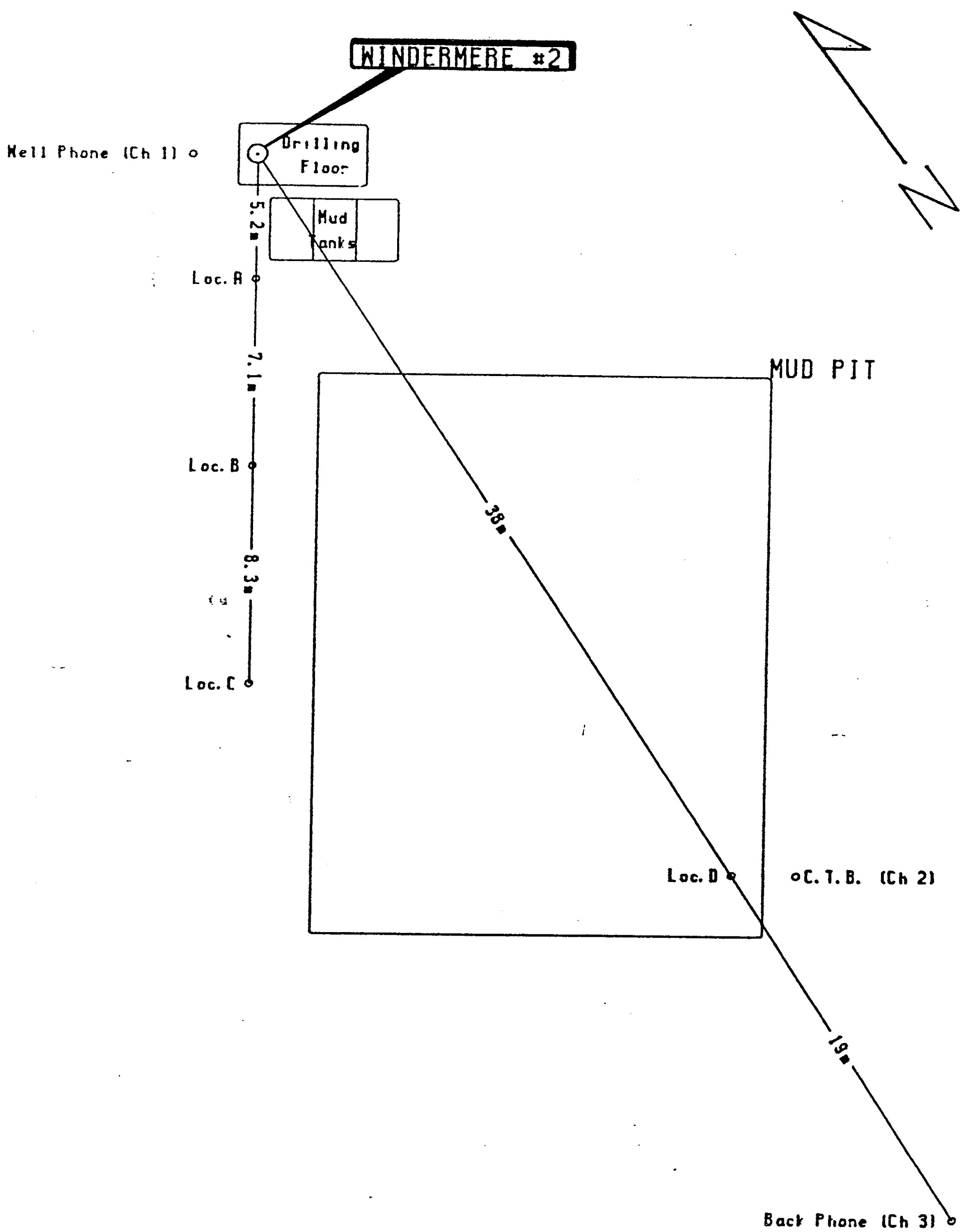
WELL LOCATION MAP

Scale 1:1250000 approx. (1 in. = 20 mi.)

0 5 10 20 30 40 50 MILES

0 5 10 20 30 40 50 60 KILOMETRES

Figure 1



WINDERMERE #2

MINORA RESOURCES NL

SHOT POINT LOCATION SKETCH

Figure 2

SUMMARY

Velocity Data Pty Ltd conducted a velocity survey for Minora Resources NL in the Windermere No.2 well PEP 111 Victoria, Australia. The survey was carried out on the 17th April 1989.

The results of the survey, which are considered to be reliable, have been used to calibrate the sonic log.

Explosives were used as an energy source with shots being fired in the mud pit.

GENERAL INFORMATION

Name of Well	:	Windermere #2
Location (Figure 1)	:	PEP 111
Coordinates	:	Latitude 038 14' 11"
	:	Longitude 142 01' 18"
Date of Survey	:	17th April 1989.
Wireline Logging	:	Gearhart DDL#3
Weather	:	Fine
Operational Base	:	Brisbane
Operator	:	N. Delphos
Shooter	:	J. Brown
Client Representative	:	Mr D. Short.

EQUIPMENT

Downhole Tool

Veldata Camlock 100 (90 mm)

Sensors:

6 HSI 4.5 Hz 215 ohm, high temperature (300 degrees F) detectors connected in series parallel. Frequency response 8-300 Hz within 3 dB.

Preamplifier:

48 dB fixed gain.
Frequency response 5-200 Hz within 3 dB.

Reference Geophone

Mark Products L1 4.5 Hz

Recording Instrument

VDLS 11/10 software controlled digital recording system utilizing SIE OPA-10 floating point amplifiers for digital recording and SIE OPA-4 amplifiers for analog presentation. The system includes a DEC LSI-11 CPU, twin cassette tape unit and printer.

RECORDING

Energy Source	:	Explosive, AN-60
Shot Location	:	Mud pit
Charge Size	:	0.25 to 3 (125 grm) sticks
Average Shot Depth	:	2.0 metre
Average Shot Offset	:	38 metres
Recording Geometry	:	Figure 2

Shots were recorded on digital cassette tape. Printouts of the shots used are included with this report. (Enclosure 2)

The sample rate was 1 ms with 0.5 ms sampling over a 200 ms window encompassing the first arrivals. The scale of the graphic display varies with signal strength and is noted on each playout.

The times were picked from the printouts using the numerical value of the signal strength. (Enclosure 2)

PROCESSING

Elevation Data

Elevation of KB	:	51.6 metres above sea level
Elevation of Ground	:	46.1 metres above sea level
Elevation of Seismic Datum	:	0.0 metres above sea level
Depth Surveyed	:	3586.0 metres below KB
Total Depth	:	3595.3 metres below KB
Depth of Casing	:	1865.5 metres below KB
Sonic Log Interval	:	15.1 to 3591.7 metres below KB

PROCESSING

Recorded Data

Number of Shots Used	:	36
Number of Levels Recorded	:	30
Data Quality	:	Fair
Noise Level	:	Low
Rejected Shots	:	5

Correction for Instrument Delay and Shot Offset

The 'corrected' times shown on the calculation sheet have been obtained via:

(i) Subtraction of the instrument delay (4msec) from the recorded arrival times
(ii) geometric correction for non-verticality of ray paths resulting from shot offset.
(iii) shot static correction to correct for the depth of shot below ground level at the well head using a correction velocity of 1100.0m/sec
(iv) readdition of the instrument delay (4msec).

Correction to Datum

As no checkshot was actually taken at the requested datum of 51.6 metres below KB it was necessary to include a dummy value at this level. The value was calculated using the average time at 52.0m combined with a calculation involving the interval velocity at this level. This value is 29.5 msec and is the effective datum correction.

PROCESSING

Calibration of Sonic Log - Method

Sonic times were adjusted to checkshot times using a linear correction of the sonic transit times.

These differences arise as the sonic tool measures the local velocity characteristics of the formation with a high frequency signal, whereas the downhole geophone records the bulk velocity character using a signal of significantly lower frequency.

Calibration of Sonic Log - Results (Enclosure 1)

The discrepancies between shot and sonic interval velocities were generally small. The largest adjustment was 18.64 us/m on the interval 367 to 426 metres below KB.

In aggregate, the shot and sonic interval times differed by 6.0 msec over the logged portion of the well.

PROCESSING

Trace Playouts (Figure 4)

Figure 4A is a plot of all traces used. No filter or gain recovery has been applied.

Figure 4B is a plot to scale in depth and time of selected traces. No filter or gain recovery has been applied.

Figure 4C is a plot to scale in depth and time of selected traces with a 5 Hz - 40 Hz filter and a gain recovery function of t**2 applied.

Figures 4D is a plot of selected surface traces. No filter or gain recovery has been applied.

Geoffrey

Geoffrey Bell
Geophysical Analyst.

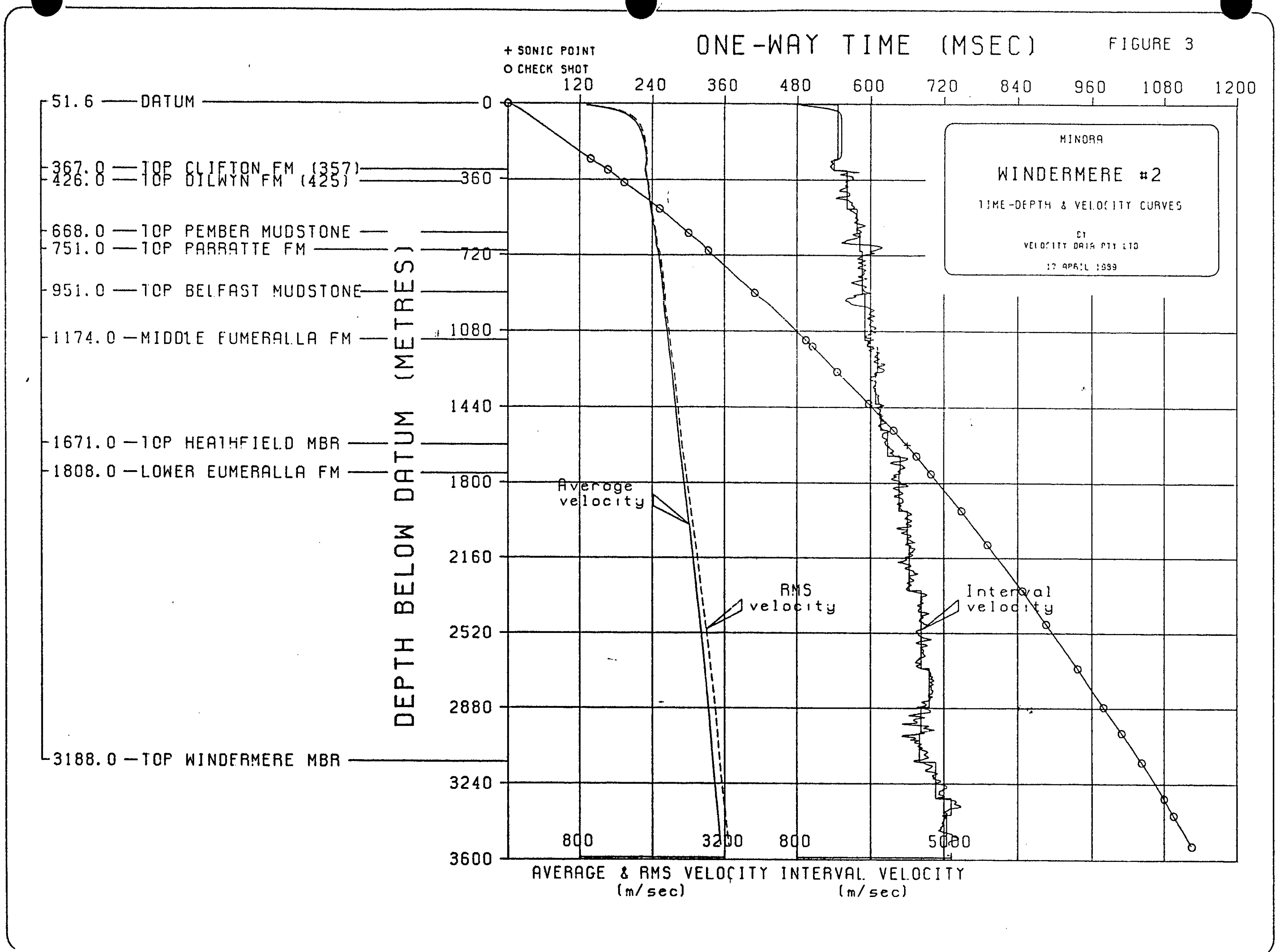


FIGURE 3
ONE-WAY TIME (MSEC)
+ SONIC POINT
O CHECK SHOT
120
240
360
480
600
720
840
960
1080
1200
MINORA
WINDERMERE #2
TIME-DEPTH & VELOCITY CURVES
CT
VELOCITY DATA PTY LTD
17 APRIL 1999
51.6 — DATUM
367.0 — TOP CLIFTON FM (357)
426.0 — TOP DILWYN FM (425)
668.0 — TOP PEMBER MUDSTONE
751.0 — TOP PARRATTE FM
951.0 — TOP BELFAST MUDSTONE
1174.0 — MIDDLE EUMERALLA FM
1671.0 — TOP HEATHFIELD MBR
1808.0 — LOWER EUMERALLA FM
3188.0 — TOP WINDERMERE MBR
DEPTH BELOW DATUM (METRES)
0
360
720
1080
1440
1800
2160
2520
2880
3240
3600
Average velocity
RMS velocity
Interval velocity
800
3200
800
5000
AVERAGE & RMS VELOCITY (m/sec)
INTERVAL VELOCITY (m/sec)

VELOCITY DATA PTY LTD — WELL SURVEY CALCULATIONS

Company : MINORA
Well : WINDERMERE #2
Elevations : Datum : 0.0 Ground : 46.1 Kelly : 51.6

Shot data :

Location	Elevation	Offset
A	40.1	5.2
B	40.1	12.3
C	40.1	20.6
D	39.9	38.0

Latitude : 038 14 11
Longitude : 142 01 19
Rig identification : A.T.C.02
Energy source : AN60
Logger : GEARHART DLL #3
Near surface velocity
for shot statics: 1100
Instrument delay: 4.0 ms

Survey date : 17-APR-89
Survey units : METRES
Times in milliseconds.

SHOT CALCULATIONS

Shot No	Geophone depth Kelly	Geophone depth Datum	Shot Locn	Shot Depth	TIMES Record	TIMES Corr.	TIMES Avg.	TIMES Below datum	Check shot interval Distance	Check shot interval Time	Velocities Average	Velocities RMS	Velocities Interval
DATUM													
	51.6	0.0					29.5	0.0					
									0.4	0.5			800.0
38	52.0	0.4	D	2.0	31.0	30.6							
39	52.0	0.4	C	0.2	27.0	30.1							
40	52.0	0.4	B	0.2	25.0	29.7							
41	52.0	0.4	A	0.2	24.0	29.5	30.0	0.5			800.0	800.0	
									263.0	137.7			1909.9
37	315.0	263.4	D	2.0	161.5	167.7	167.7	138.2			1905.9	1907.1	
									52.0	28.7			1811.8
TOP CLIFTON FM (357)													
36	367.0	315.4	D	2.0	190.0	196.4	196.4	166.9			1889.8	1891.1	
									59.0	27.2			2169.1
TOP DILWYN FM (425)													
35	426.0	374.4	D	2.0	217.0	223.6	223.6	194.1			1928.9	1932.4	
									126.0	58.2			2164.9
34	552.0	500.4	D	2.0	275.0	281.8	281.8	252.3			1983.4	1988.5	
									116.0	47.6			2437.0
TOP PEMBER MUDSTONE													
33	668.0	616.4	D	2.0	322.5	329.4	329.4	299.9			2055.4	2066.2	
									83.0	33.1			2507.6
TOP PEBBLE POINT													
32	716.0	664.4	D	2.0	341.5	348.5 N/U							
TOP PARRATTE FM													
31	751.0	699.4	D	2.0	355.5	362.5	362.5	333.0			2100.3	2114.2	
									200.0	77.6			2577.3
TOP BELFAST MUDSTONE													
30	951.0	899.4	D	2.0	433.0	440.1	440.1	410.6			2190.5	2209.2	
									223.0	84.1			2651.6
UPPER EUMERALLA UNC													
28	1010.0	958.4	D	2.0	445.5	452.6 N/U							
MIDDLE EUMERALLA FM													
27	1174.0	1122.4	D	2.0	517.0	524.2	524.2	494.7			2268.8	2290.4	

VELOCITY DATA PTY LTD

WELL SURVEY CALCULATIONS

Company : MINORA
Well : WINDERMERE #2
Elevations : Datum : 0.0 Ground : 46.1 Kelly : 51.6

Shot data : Location	Elevation	Offset
A	40.1	5.2
B	40.1	12.3
C	40.1	20.6
D	39.9	38.0

Latitude : 038 14 11
Longitude : 142 01 19
Rig identification : A.T.C.02
Energy source : AN60
Logger : GEARHART DLL #3
Near surface velocity for shot statics: 1100
Instrument delay: 4.0 ms

Survey date : 17-APR-89
Survey units : METRES
Times in milliseconds.

SHOT CALCULATIONS

Shot No	Geophone depth Kelly	Geophone depth Datum	Shot Locn	Shot Depth	TIMES Record	TIMES Corr.	TIMES Avg.	TIMES Below datum	Check shot interval Distance	Check shot interval Time	Velocities Average	Velocities RMS	Velocities Interval
MIDDLE EUMERALLA FM													
27	1174.0	1122.4	D	2.0	517.0	524.2	524.2	494.7			2268.8	2290.4	
									30.1	11.0			2736.4
29	1204.1	1152.5	D	2.0	528.0	535.2	535.2	505.7			2279.0	2301.0	
									119.9	40.0			2997.5
26	1324.0	1272.4	D	2.0	568.0	575.2	575.2	545.7			2331.7	2359.1	
									151.0	51.5			2932.0
25	1475.0	1423.4	D	2.0	619.5	626.7	626.7	597.2			2383.5	2413.9	
									125.0	40.5			3086.4
1	1600.0	1548.4	D	1.8	660.0	667.1							
24	1600.0	1548.4	D	2.0	660.0	667.3	667.2	637.7			2428.1	2462.0	
									123.0	37.6			3271.3
23	1723.0	1671.4	D	2.0	697.5	704.8	704.8	675.3			2475.0	2514.0	
									85.0	23.5			3617.0
LOWER EUMERALLA FM													
22	1808.0	1756.4	D	2.0	721.0	728.3	728.3	698.8			2513.5	2558.8	
									177.0	49.5			3575.8
21	1985.0	1933.4	D	2.0	770.5	777.8	777.8	748.3			2583.7	2638.2	
									162.0	42.5			3811.8
20	2147.0	2095.4	D	2.0	813.0	820.3	820.3	790.8			2649.7	2714.2	
									220.0	57.0			3859.6
18	2243.0	2191.4	D	2.0	835.5	842.8 N/U							
17	2367.0	2315.4	D	2.0	870.0	877.3	877.3	847.8			2731.1	2805.9	
									160.0	38.2			4188.5
3	2527.0	2475.4	D	1.8	908.5	915.7							
16	2527.0	2475.4	D	2.0	908.0	915.4	915.5	886.0			2793.9	2879.3	
									213.0	50.9			4184.7
15	2740.0	2688.4	D	2.0	959.0	966.4	966.4	936.9			2869.5	2965.0	
									185.0	42.0			4404.8
14	2925.0	2873.4	D	2.0	1001.0	1008.4	1008.4	978.9			2935.3	3040.8	
									125.0	30.0			4166.7
13	3050.0	2998.4	D	2.0	1031.0	1038.4	1038.4	1008.9			2971.9	3080.2	
									138.0	33.5			4119.4
TOP WINDERMERE MBR													
12	3188.0	3136.4	D	2.0	1064.5	1071.9	1071.9	1042.4			3008.8	3119.0	
									172.0	37.5			4586.7
11	3235.0	3183.4	D	2.0	1076.0	1083.4 N/U							
9	3360.0	3308.4	D	2.0	1102.0	1109.4							
10	3360.0	3308.4	D	2.0	1102.0	1109.4	1109.4	1079.9			3063.6	3181.3	

VELOCITY DATA PTY LTD

WELL SURVEY CALCULATIONS

Company : MINORA
Well : WINDERMERE #2
Elevations : Datum : 0.0 Ground : 46.1 Kelly : 51.6

Shot data :

Location	Elevation	Offset
A	40.1	5.2
B	40.1	12.3
C	40.1	20.6
D	39.9	38.0

Latitude : 038 14 11
Longitude : 142 01 19
Rig identification : A.T.C.02
Energy source : AN60
Logger : GEARHART DLL #3
Near surface velocity for shot statics: 1100
Instrument delay: 4.0 ms

Survey date : 17-APR-89
Survey units : METRES
Times in milliseconds.

SHOT CALCULATIONS

Shot No	Geophone depth Kelly	Geophone depth Datum	Shot Locn	Shot Depth	TIMES Record	TIMES Corr.	TIMES Avg.	TIMES Below datum	Check shot interval Distance	Check shot interval Time	Velocities Average	Velocities RMS	Velocities Interval
10	3360.0	3308.4	D	2.0	1102.0	1109.4	1109.4	1079.9			3063.6	3181.3	
									80.0	16.0			5000.0
7	3440.0	3388.4	D	2.0	1118.0	1125.4	1125.4	1095.9			3091.9	3215.3	
									146.0	30.0			4866.7
6	3586.0	3534.4	D	2.0	1148.0	1155.4	1155.4	1125.9			3139.2	3270.1	

Company : MINORA
Well : WINDERMERE #2
Elevations : Datum : 0.0 Ground : 46.1 Kelly : 51.6

Latitude : 038 14 11
Longitude : 142 01 19

Survey date : 17-APR-89
Survey units : METRES
Times in milliseconds.

SONIC DRIFT

	Geophone depth Kelly	---- Datum	Check shot times Average	- Below datum	Check shot interval Distance	-- Time	Sonic Int. time	Interval sonic drift usec/m	--- msec	Cumulative drift msec
DATUM										
	51.6	0.0	29.5	0.0						
					0.4	0.5				
	52.0	0.4	30.0	0.5						
					263.0	137.7				
	315.0	263.4	167.7	138.2						
					52.0	28.7				
TOP CLIFTON FM (357)	367.0	315.4	196.4	166.9						
					59.0	27.2	28.3	-18.64	-1.1	-1.1
TOP DILWYN FM (425)	426.0	374.4	223.6	194.1						
					126.0	58.2	57.9	2.38	0.3	-0.8
	552.0	500.4	281.8	252.3						
					116.0	47.6	47.7	-0.86	-0.1	-0.9
TOP PEMBER MUDSTONE	668.0	616.4	329.4	299.9						
					83.0	33.1	34.3	-14.46	-1.2	-2.1
TOP PEBBLE POINT TOP PARRATTE FM	751.0	699.4	362.5	333.0						
					200.0	77.6	79.8	-11.00	-2.2	-4.3
TOP BELFAST MUDSTONE	951.0	899.4	440.1	410.6						
					223.0	84.1	87.3	-14.35	-3.2	-7.5
UPPER EUMERALLA UNC MIDDLE EUMERALLA FM	1174.0	1122.4	524.2	494.7						
					30.1	11.0	10.5	16.61	0.5	-7.0
	1204.1	1152.5	535.2	505.7						
					119.9	40.0	40.1	-0.83	-0.1	-7.1
	1324.0	1272.4	575.2	545.7						
					151.0	51.5	49.1	15.89	2.4	-4.7
	1475.0	1423.4	626.7	597.2						
					125.0	40.5	38.2	18.40	2.3	-2.4
	1600.0	1548.4	667.2	637.7						
					123.0	37.6	35.4	17.89	2.2	-0.2
	1723.0	1671.4	704.8	675.3						
					85.0	23.5	22.9	7.06	0.6	0.4
LOWER EUMERALLA FM	1808.0	1756.4	728.3	698.8						
					177.0	49.5	48.4	6.21	1.1	1.5
	1985.0	1933.4	777.8	748.3						

Company : MINORA
Well : WINDERMERE #2
Elevations : Datum : 0.0 Ground : 46.1 Kelly : 51.6

Latitude : 038 14 11
Longitude : 142 01 19

Survey date : 17-APR-89
Survey units : METRES
Times in milliseconds.

SONIC DRIFT

Geophone depth Kelly	---- Datum	Check shot times Average	- Below datum	Check shot interval Distance	-- Time	Sonic Int. time	Interval usec/m	sonic drift --- msec	Cumulative drift msec
1985.0	1933.4	777.8	748.3						
				162.0	42.5	42.6	-0.62	-0.1	1.4
2147.0	2095.4	820.3	790.8						
				220.0	57.0	54.9	9.55	2.1	3.5
2367.0	2315.4	877.3	847.8						
				160.0	38.2	38.6	-2.50	-0.4	3.1
2527.0	2475.4	915.5	886.0						
				213.0	50.9	49.0	8.92	1.9	5.0
2740.0	2688.4	966.4	936.9						
				185.0	42.0	41.2	4.32	0.8	5.8
2925.0	2873.4	1008.4	978.9						
				125.0	30.0	30.0	0.00	0.0	5.8
3050.0	2998.4	1038.4	1008.9						
				138.0	33.5	33.0	3.62	0.5	6.3
TOP WINDERMERE MBR									
3188.0	3136.4	1071.9	1042.4						
				172.0	37.5	36.9	3.49	0.6	6.9
3360.0	3308.4	1109.4	1079.9						
				80.0	16.0	16.6	-7.50	-0.6	6.3
3440.0	3388.4	1125.4	1095.9						
				146.0	30.0	30.3	-2.05	-0.3	6.0
3586.0	3534.4	1155.4	1125.9						

Company : MINORA
Well : WINDERMERE #2
Elevations : Datum : 0.0 Ground : 46.1 Kelly : 51.6

Latitude : 038 14 11
Longitude : 142 01 19

Survey date : 17-APR-89
Survey units : METRES
Times in milliseconds.

SONIC CALIBRATION

	Geophone depth Kelly	Datum	Interval Distance	Original sonic times Interval	Cumulative	Adjusted sonic times Interval	Calibrated	Velocities Average	RMS	Interval
DATUM	51.6	0.0								
			0.4							800.0
	52.0	0.4						800.0	800.0	
			263.0							1909.9
	315.0	263.4						1905.9	1907.1	
			52.0							1811.8
TOP CLIFTON FM (357)	367.0	315.4						1889.8	1891.1	
			59.0	28.3		27.2				2169.1
TOP DILWYN FM (425)	426.0	374.4			28.3		194.1	1928.9	1932.4	
			126.0	57.9		58.2				2164.9
	552.0	500.4			86.2		252.3	1983.4	1988.5	
			116.0	47.7		47.6				2437.0
TOP PEMBER MUDSTONE	668.0	616.4			133.9		299.9	2055.4	2066.2	
			83.0	34.3		33.1				2507.6
TOP PARRATTE FM	751.0	699.4			168.2		333.0	2100.3	2114.2	
			200.0	79.8		77.6				2577.3
TOP BELFAST MUDSTONE	951.0	899.4			248.0		410.6	2190.5	2209.2	
			223.0	87.3		84.1				2651.6
MIDDLE EUMERALLA FM	1174.0	1122.4			335.3		494.7	2268.8	2290.4	
			30.1	10.5		11.0				2736.4
	1204.1	1152.5			345.8		505.7	2279.0	2301.0	
			119.9	40.1		40.0				2997.5
	1324.0	1272.4			385.9		545.7	2331.7	2359.1	
			151.0	49.1		51.5				2932.0
	1475.0	1423.4			435.0		597.2	2383.5	2413.9	
			125.0	38.2		40.5				3086.4
	1600.0	1548.4			473.2		637.7	2428.1	2462.0	
			71.0	20.9		22.2				3202.5
TOP HEATHFIELD MBR	1671.0	1619.4			494.1		659.9	2454.1	2490.5	
			52.0	14.5		15.4				3370.0
	1723.0	1671.4			508.6		675.3	2475.0	2514.0	
			85.0	22.9		23.5				3617.0
LOWER EUMERALLA FM	1808.0	1756.4			531.5		698.8	2513.5	2558.9	
			177.0	48.4		49.5				3575.8
	1985.0	1933.4			579.9		748.3	2583.7	2638.3	

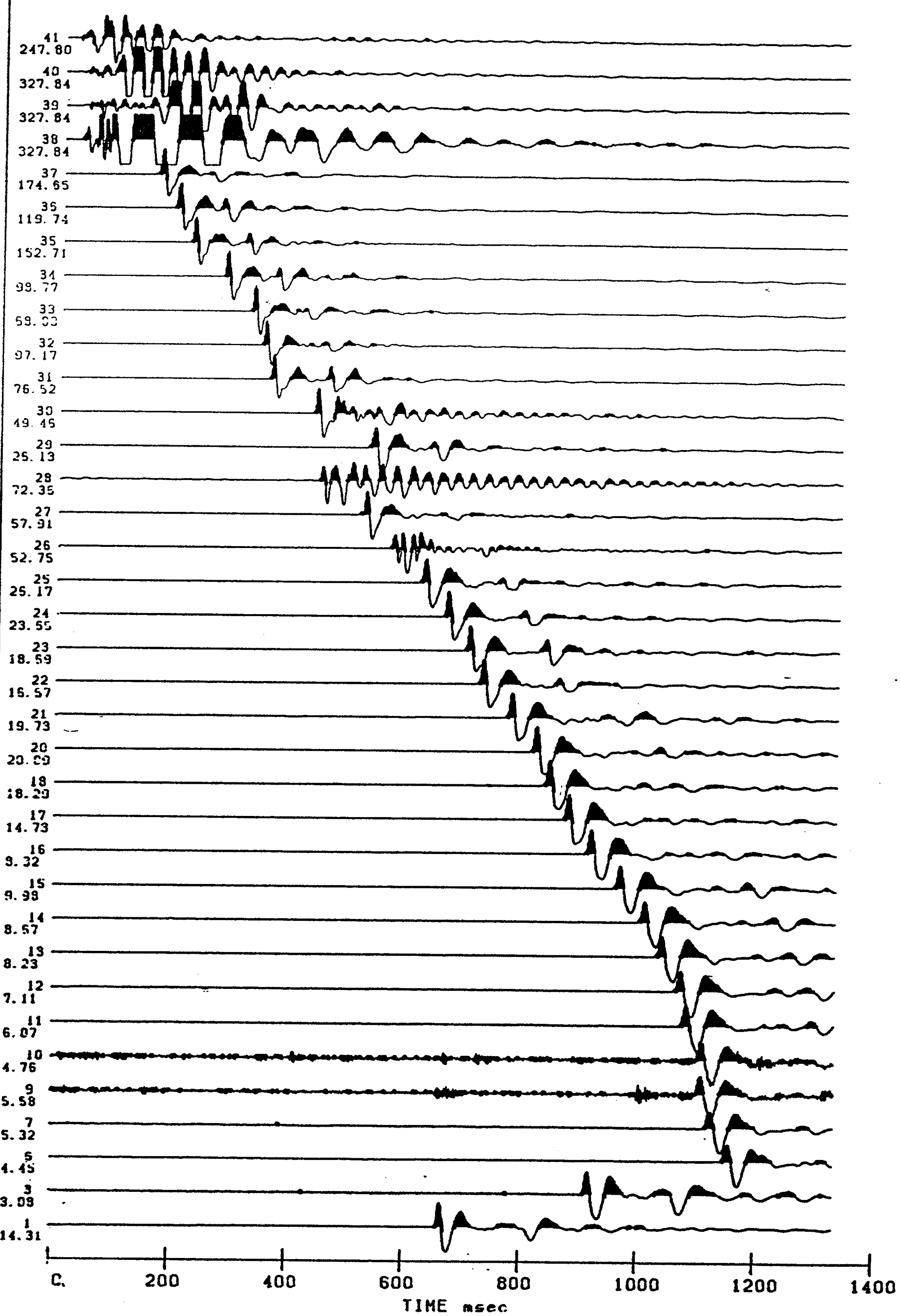
Company : MINORA
Well : WINDERMERE #2
Elevations : Datum : 0.0 Ground : 46.1 Kelly : 51.6

Latitude : 038 14 11
Longitude : 142 01 19

Survey date : 17-APR-89
Survey units : METRES
Times in milliseconds.

SONIC CALIBRATION

Geophone depth Kelly	Geophone depth Datum	Interval Distance	Original sonic times Interval	Original sonic times Cumulative	Adjusted sonic times Interval	Adjusted sonic times Calibrated	Velocities Average	Velocities RMS	Velocities Interval
1985.0	1933.4			579.9		748.3	2583.7	2638.3	
		162.0	42.6		42.5				3811.8
2147.0	2095.4			622.5		790.8	2649.7	2714.3	
		220.0	54.9		57.0				3859.6
2367.0	2315.4			677.4		847.8	2731.1	2806.0	
		160.0	38.6		38.2				4188.5
2527.0	2475.4			716.0		886.0	2793.9	2879.3	
		213.0	49.0		50.9				4184.7
2740.0	2688.4			765.0		936.9	2869.5	2965.0	
		185.0	41.2		42.0				4404.8
2925.0	2873.4			806.2		978.9	2935.3	3040.8	
		125.0	30.0		30.0				4166.7
3050.0	2998.4			836.2		1008.9	2971.9	3080.2	
		138.0	33.0		33.5				4119.4
TOP WINDERMERE MBR									
3188.0	3136.4			869.2		1042.4	3008.8	3119.0	
		172.0	36.9		37.5				4586.7
3360.0	3308.4			906.1		1079.9	3063.6	3181.4	
		80.0	16.6		16.0				5000.0
3440.0	3388.4			922.7		1095.9	3091.9	3215.3	
		146.0	30.3		30.0				4866.7
3586.0	3534.4			953.0		1125.9	3139.2	3270.1	



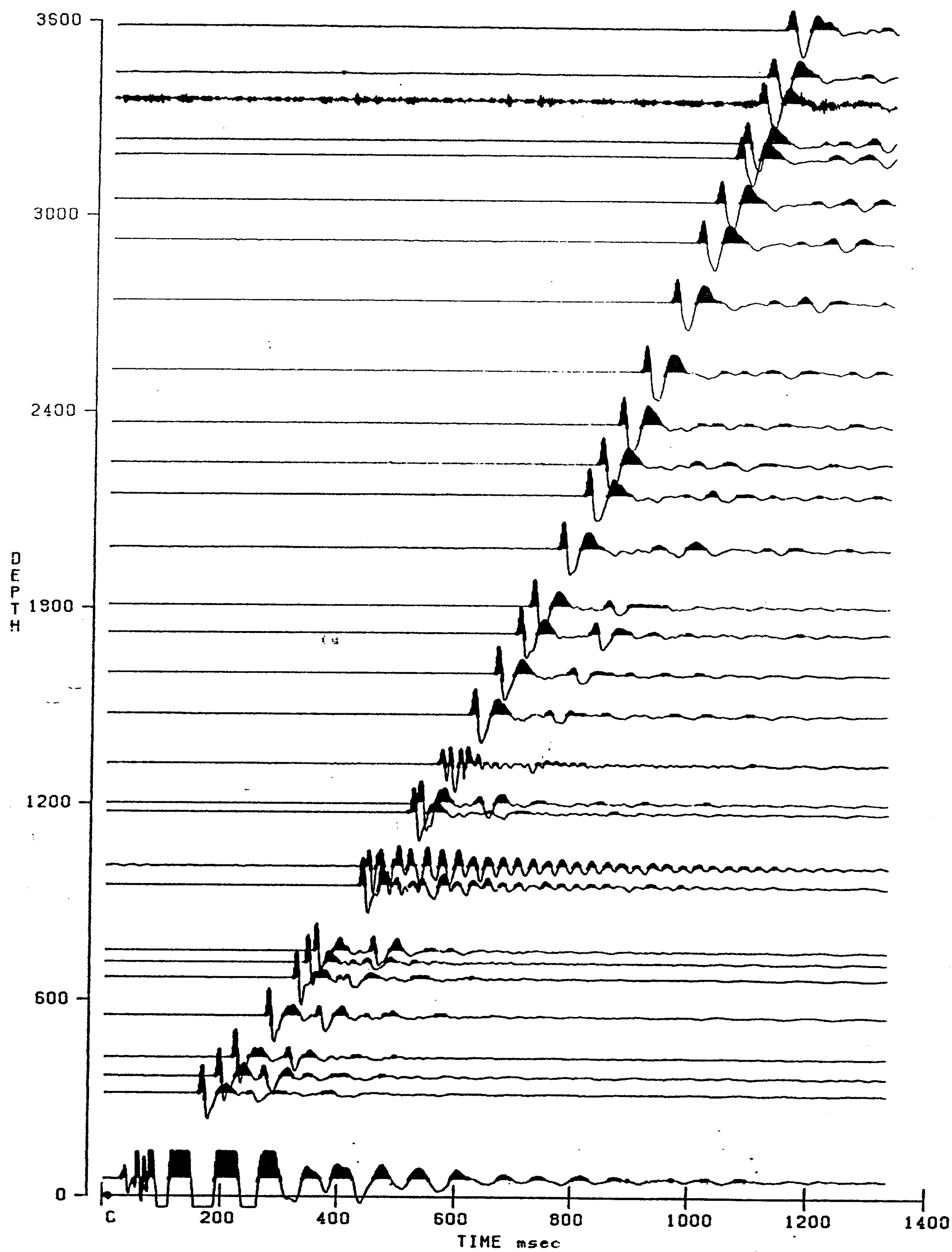
WINDERMERE #2

VELOCITY SURVEY TRACE DISPLAY

Filter OUT-OUT

No gain recovery

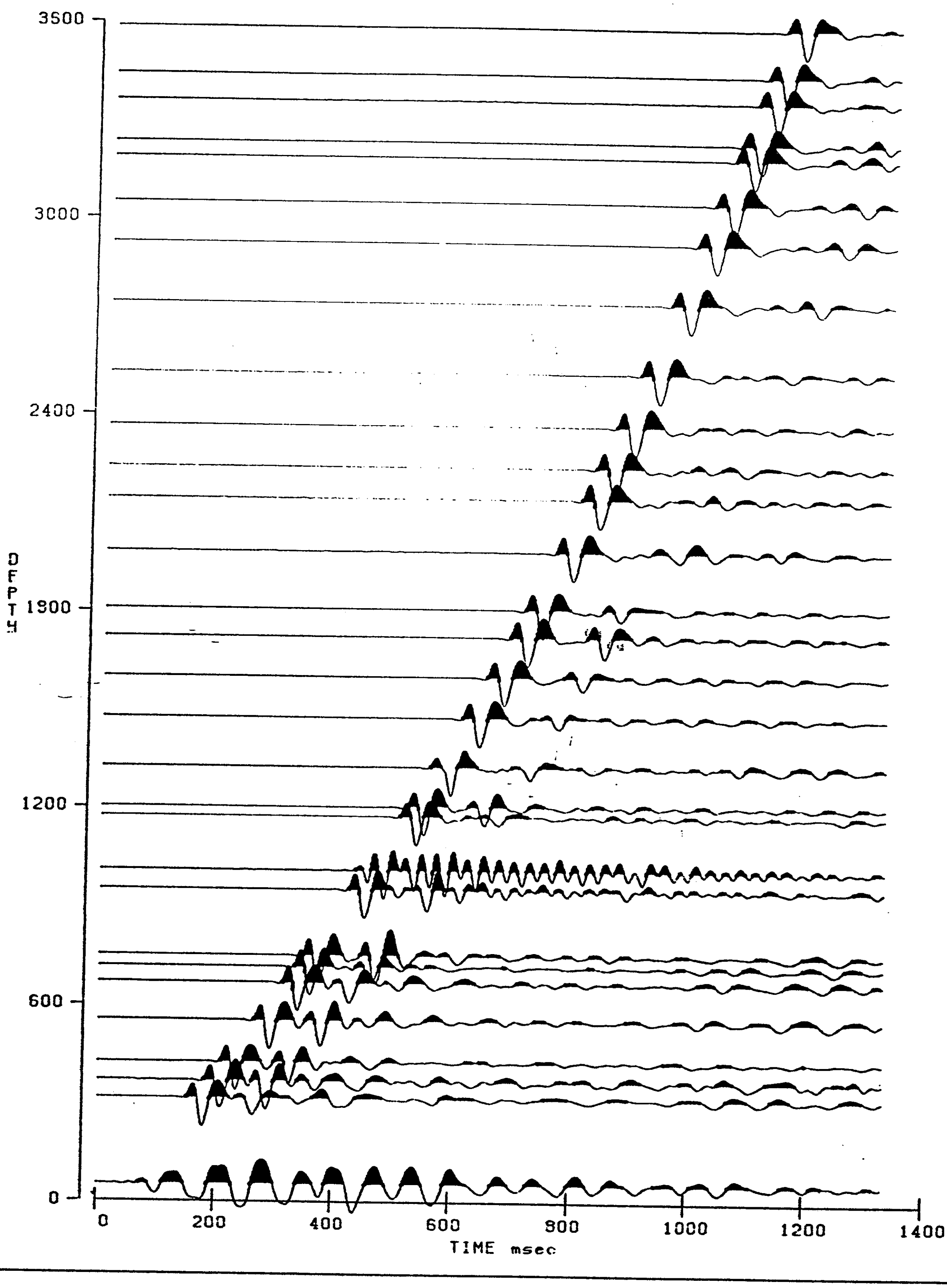
Figure 4A



WINDERMERE #2

VELOCITY SURVEY TRACE DISPLAY
Filter OUT-OUT
No gain recovery

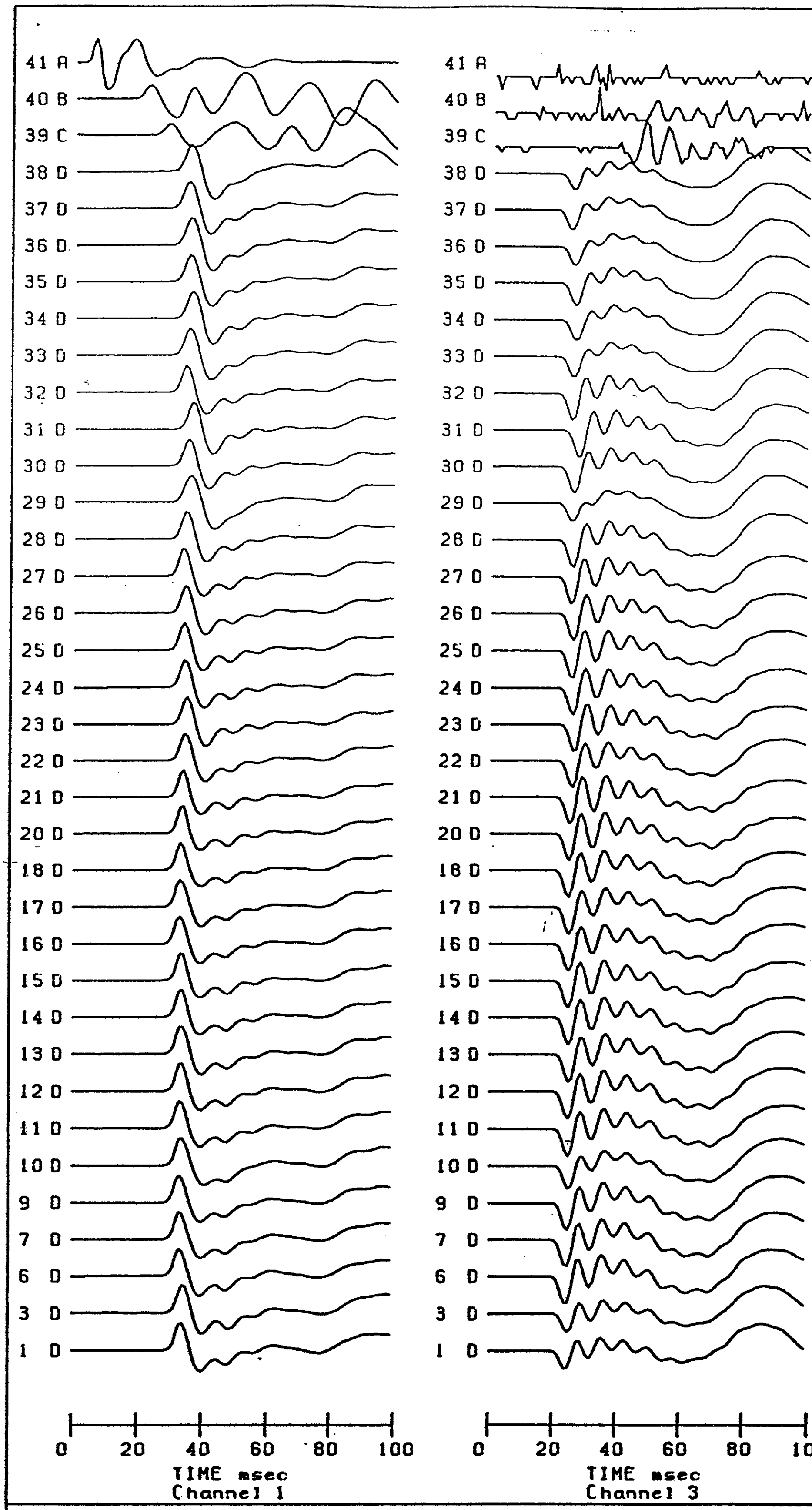
Figure 4B



WINDERMERE #2

VELOCITY SURVEY TRACE DISPLAY
Filter 5-40
Gain $T^{2.0}$

Figure 4C



WINDERMERE #2

VELOCITY SURVEY TRACE DISPLAY

Auxiliary channels

Filter OUT-OUT

Figure 4D

TABLE 1. Time-Depth curve values

Well : WINDERMERE #2 Client : MINORA
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 265.0 to 3530.0

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
5.0	5.5	914	914	914
10.0	9.7	1033	1042	1189
15.0	13.2	1141	1160	1439
20.0	16.2	1234	1264	1637
25.0	19.0	1314	1352	1778
30.0	21.7	1383	1426	1871
35.0	24.3	1441	1488	1929
40.0	26.8	1491	1540	1964
45.0	29.4	1533	1583	1984
50.0	31.9	1570	1619	1997
55.0	34.4	1601	1650	2004
60.0	36.8	1629	1677	2008
65.0	39.3	1653	1700	2010
70.0	41.8	1674	1720	2011
75.0	44.3	1693	1737	2012
80.0	46.8	1710	1753	2013
85.0	49.3	1725	1767	2013
90.0	51.8	1739	1780	2013
95.0	54.2	1752	1791	2013
100.0	56.7	1763	1801	2013
105.0	59.2	1774	1811	2013
110.0	61.7	1783	1819	2013
115.0	64.2	1792	1827	2013
120.0	66.7	1800	1835	2013
125.0	69.1	1808	1841	2013
130.0	71.6	1815	1847	2013
135.0	74.1	1822	1853	2013
140.0	76.6	1828	1859	2013
145.0	79.1	1834	1864	2013
150.0	81.6	1839	1868	2013
155.0	84.0	1844	1873	2013
160.0	86.5	1849	1877	2013
165.0	89.0	1854	1881	2013
170.0	91.5	1858	1885	2013
175.0	94.0	1862	1888	2013
180.0	96.5	1866	1892	2013
185.0	98.9	1870	1895	2013
190.0	101.4	1873	1898	2013
195.0	103.9	1877	1901	2013
200.0	106.4	1880	1903	2013
205.0	108.9	1883	1906	2013
210.0	111.4	1886	1908	2013
215.0	113.8	1889	1911	2013
220.0	116.3	1891	1913	2012
225.0	118.8	1894	1915	2012
230.0	121.3	1896	1917	2011
235.0	123.8	1898	1919	2009
240.0	126.3	1901	1921	2005
245.0	128.8	1902	1922	1999
250.0	131.3	1904	1923	1988
255.0	133.8	1905	1924	1970
260.0	136.4	1906	1925	1940
265.0	138.6	1913	1924	1889
270.0	141.5	1908	1920	1705
275.0	144.3	1905	1917	1751
280.0	147.2	1903	1914	1778
285.0	150.0	1900	1911	1771
290.0	152.9	1896	1908	1708
295.0	155.9	1893	1904	1701
300.0	158.7	1890	1901	1752
305.0	161.6	1887	1898	1707
310.0	164.4	1886	1897	1819
315.0	167.2	1884	1895	1780
320.0	169.5	1888	1899	2156
325.0	171.4	1897	1909	2716
330.0	173.8	1899	1912	2085
335.0	176.4	1899	1912	1887
340.0	178.7	1902	1915	2136
345.0	180.9	1908	1921	2370
350.0	183.2	1911	1924	2155
355.0	185.2	1917	1930	2460
360.0	187.4	1921	1935	2264
365.0	189.7	1924	1938	2191
370.0	192.1	1926	1939	2052
375.0	194.4	1929	1943	2228
380.0	196.7	1932	1946	2142
385.0	199.0	1934	1948	2141
390.0	201.4	1936	1950	2090
395.0	203.7	1940	1953	2255
400.0	206.0	1942	1955	2111

TABLE 1. Time-Depth curve values

Well : WINDERMERE #2 Client : MINORA
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 265.0 to 3530.0

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
405.0	208.5	1942	1956	2019
410.0	211.1	1942	1956	1937
415.0	213.6	1942	1956	1951
420.0	215.9	1945	1958	2183
425.0	218.2	1948	1961	2240
430.0	220.4	1951	1964	2241
435.0	222.6	1954	1967	2240
440.0	224.9	1957	1970	2251
445.0	227.5	1956	1969	1890
450.0	230.3	1954	1967	1754
455.0	232.6	1956	1970	2245
460.0	234.8	1959	1972	2210
465.0	237.1	1961	1975	2233
470.0	239.2	1965	1978	2321
475.0	241.4	1968	1981	2316
480.0	243.6	1970	1984	2262
485.0	245.8	1974	1987	2320
490.0	247.9	1977	1991	2376
495.0	250.0	1980	1994	2357
500.0	252.1	1983	1998	2338
505.0	254.4	1985	1999	2180
510.0	256.6	1987	2002	2270
515.0	258.7	1991	2005	2371
520.0	260.8	1994	2008	2372
525.0	262.9	1997	2012	2469
530.0	265.0	2000	2015	2382
535.0	267.0	2004	2019	2440
540.0	269.1	2007	2022	2370
545.0	271.2	2010	2025	2392
550.0	273.2	2013	2029	2473
555.0	275.2	2017	2033	2506
560.0	277.3	2019	2035	2359
565.0	279.5	2022	2038	2369
570.0	281.5	2025	2041	2423
575.0	283.4	2029	2046	2613
580.0	285.2	2033	2051	2753
585.0	287.2	2037	2054	2497
590.0	289.3	2040	2057	2471
595.0	291.4	2042	2060	2389
600.0	293.4	2045	2063	2500
605.0	295.4	2048	2067	2501
610.0	297.3	2052	2070	2585
615.0	299.3	2055	2073	2472
620.0	301.6	2056	2075	2242
625.0	303.6	2058	2077	2402
630.0	305.6	2062	2081	2598
635.0	307.6	2064	2083	2442
640.0	309.7	2066	2086	2377
645.0	311.9	2068	2087	2274
650.0	314.3	2068	2087	2074
655.0	316.6	2069	2088	2188
660.0	319.3	2067	2086	1887
665.0	321.4	2069	2087	2288
670.0	323.2	2073	2092	2835
675.0	324.9	2078	2098	2955
680.0	326.5	2083	2104	3167
685.0	328.1	2088	2110	3120
690.0	329.7	2093	2116	2998
695.0	331.4	2097	2121	2953
700.0	333.2	2101	2125	2764
705.0	335.1	2104	2129	2768
710.0	336.7	2108	2134	2960
715.0	338.6	2112	2137	2712
720.0	340.6	2114	2140	2511
725.0	342.5	2117	2142	2555
730.0	344.5	2119	2145	2509
735.0	346.6	2121	2146	2402
740.0	348.6	2123	2149	2554
745.0	350.4	2126	2152	2721
750.0	352.3	2129	2155	2610
755.0	354.5	2130	2156	2336
760.0	356.4	2133	2159	2641
765.0	358.2	2136	2162	2718
770.0	360.1	2138	2165	2581
775.0	362.1	2140	2167	2510
780.0	364.2	2141	2168	2359
785.0	366.1	2144	2170	2622
790.0	368.0	2147	2174	2723
795.0	369.9	2149	2176	2587
800.0	371.9	2151	2178	2535

TABLE 1. Time-Depth curve values Page 3.

Well : WINDERMERE #2 Client : MINORA
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 265.0 to 3530.0

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
805.0	373.7	2154	2181	2714
810.0	375.6	2156	2183	2605
815.0	377.6	2158	2186	2571
820.0	379.6	2160	2187	2485
825.0	381.7	2162	2189	2432
830.0	383.5	2165	2192	2792
835.0	385.4	2167	2194	2627
840.0	387.4	2168	2195	2414
845.0	389.5	2169	2197	2411
850.0	391.8	2169	2196	2175
855.0	393.8	2171	2198	2493
860.0	395.9	2172	2199	2413
865.0	397.7	2175	2202	2734
870.0	399.6	2177	2204	2657
875.0	401.5	2179	2207	2625
880.0	403.4	2181	2208	2562
885.0	405.4	2183	2211	2611
890.0	407.3	2185	2213	2641
895.0	409.2	2187	2215	2604
900.0	410.8	2191	2219	3025
905.0	412.8	2192	2220	2563
910.0	415.1	2192	2220	2156
915.0	417.0	2194	2222	2569
920.0	419.2	2195	2222	2332
925.0	421.6	2194	2221	2075
930.0	423.9	2194	2221	2180
935.0	426.3	2194	2221	2110
940.0	428.5	2194	2221	2217
945.0	430.8	2194	2221	2215
950.0	433.0	2194	2221	2261
955.0	435.2	2195	2221	2295
960.0	437.1	2196	2223	2525
965.0	438.9	2198	2225	2780
970.0	440.8	2201	2228	2731
975.0	442.5	2203	2230	2823
980.0	444.2	2206	2234	2971
985.0	446.0	2209	2236	2859
990.0	447.8	2211	2239	2748
995.0	449.6	2213	2241	2829
1000.0	451.4	2215	2243	2719

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
1005.0	453.2	2218	2246	2817
1010.0	454.8	2221	2249	3062
1015.0	456.6	2223	2252	2719
1020.0	458.5	2225	2253	2686
1025.0	460.3	2227	2256	2774
1030.0	462.0	2229	2258	2907
1035.0	463.8	2232	2261	2902
1040.0	465.5	2234	2263	2790
1045.0	467.3	2236	2266	2807
1050.0	469.1	2238	2268	2743
1055.0	470.9	2240	2270	2798
1060.0	472.7	2243	2273	2913
1065.0	474.3	2245	2276	3011
1070.0	476.0	2248	2278	2893
1075.0	477.8	2250	2281	2815
1080.0	479.6	2252	2283	2809
1085.0	481.3	2254	2286	3004
1090.0	483.0	2257	2288	2926
1095.0	484.8	2259	2290	2710
1100.0	486.6	2260	2292	2730
1105.0	488.6	2262	2293	2622
1110.0	490.4	2263	2295	2660
1115.0	492.2	2266	2297	2891
1120.0	493.9	2268	2300	2924
1125.0	495.7	2269	2301	2730
1130.0	497.5	2271	2303	2783
1135.0	499.2	2273	2305	2866
1140.0	501.1	2275	2307	2669
1145.0	502.9	2277	2309	2749
1150.0	504.8	2278	2310	2733
1155.0	506.5	2280	2312	2883
1160.0	508.2	2282	2315	2870
1165.0	510.0	2284	2317	2848
1170.0	511.9	2286	2318	2668
1175.0	513.6	2288	2320	2895
1180.0	515.2	2290	2323	3175
1185.0	516.9	2293	2326	2926
1190.0	518.6	2295	2328	2973
1195.0	520.3	2297	2330	2948
1200.0	522.0	2299	2332	2877

Well : WINDERMERE #2 Client : MINORA
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 265.0 to 3530.0

Datum Depth	One-way time(ms)	Average	RMS	Interval	Datum Depth	One-way time(ms)	Average	RMS	Interval
		-----VELOCITIES-----					-----VELOCITIES-----		
1205.0	523.7	2301	2335	2945	1405.0	591.1	2377	2415	3023
1210.0	525.3	2303	2337	3139	1410.0	592.8	2379	2417	3012
1215.0	527.0	2306	2340	2987	1415.0	594.4	2380	2419	2995
1220.0	528.7	2308	2342	2867	1420.0	596.1	2382	2421	3073
1225.0	530.4	2309	2344	2895	1425.0	597.7	2384	2423	2994
1230.0	532.1	2311	2346	2961	1430.0	599.2	2386	2426	3324
1235.0	533.6	2314	2349	3339	1435.0	600.9	2388	2428	3062
1240.0	535.2	2317	2352	3083	1440.0	602.6	2390	2429	2916
1245.0	536.9	2319	2354	2980	1445.0	604.2	2391	2431	3021
1250.0	538.6	2321	2356	2979	1450.0	605.9	2393	2433	3037
1255.0	540.2	2323	2359	3068	1455.0	607.5	2395	2435	3089
1260.0	541.8	2326	2362	3224	1460.0	609.2	2397	2437	3028
1265.0	543.4	2328	2364	3153	1465.0	610.8	2398	2438	3021
1270.0	544.9	2331	2367	3175	1470.0	612.5	2400	2440	3029
1275.0	546.6	2333	2369	2984	1475.0	614.1	2402	2442	3089
1280.0	548.3	2334	2371	2922	1480.0	615.6	2404	2444	3212
1285.0	550.0	2336	2373	2963	1485.0	617.3	2406	2446	3026
1290.0	551.7	2338	2375	2985	1490.0	618.9	2407	2448	3030
1295.0	553.5	2340	2377	2796	1495.0	620.6	2409	2450	3041
1300.0	555.2	2341	2378	2827	1500.0	622.2	2411	2452	3177
1305.0	557.1	2343	2380	2753	1505.0	623.8	2413	2453	3052
1310.0	558.9	2344	2381	2787	1510.0	625.3	2415	2456	3362
1315.0	560.6	2346	2383	2841	1515.0	626.9	2417	2458	3151
1320.0	562.3	2348	2385	3028	1520.0	628.5	2419	2460	3134
1325.0	564.0	2349	2387	2929	1525.0	630.2	2420	2461	2917
1330.0	565.7	2351	2389	2945	1530.0	631.8	2422	2463	3073
1335.0	567.4	2353	2390	2920	1535.0	633.4	2423	2465	3084
1340.0	569.1	2355	2392	2888	1540.0	635.0	2425	2467	3116
1345.0	570.9	2356	2393	2843	1545.0	636.6	2427	2469	3113
1350.0	572.6	2358	2395	2906	1550.0	638.1	2429	2471	3351
1355.0	574.3	2359	2397	2919	1555.0	639.6	2431	2473	3342
1360.0	576.0	2361	2399	2894	1560.0	641.2	2433	2475	3147
1365.0	577.7	2363	2400	2935	1565.0	642.8	2435	2477	3106
1370.0	579.4	2364	2402	2954	1570.0	644.4	2436	2479	3121
1375.0	581.1	2366	2404	2984	1575.0	646.0	2438	2481	3140
1380.0	582.9	2368	2405	2853	1580.0	647.6	2440	2482	3097
1385.0	584.4	2370	2408	3241	1585.0	649.2	2441	2484	3149
1390.0	586.1	2371	2410	2898	1590.0	650.7	2443	2487	3311
1395.0	587.8	2373	2412	3022	1595.0	652.3	2445	2488	3163
1400.0	589.4	2375	2413	3003	1600.0	653.8	2447	2490	3247

TABLE 1. Time-Depth curve values Page 5.

Well : WINDERMERE #2
Survey units : METRES
Calibrated sonic interval velocities used from 265.0 to 3530.0

Client : MINORA
Datum : 0.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
1605.0	655.4	2449	2492	3144	1805.0	712.7	2532	2587	3503
1610.0	657.0	2451	2494	3256	1810.0	714.1	2535	2590	3824
1615.0	658.5	2452	2496	3182	1815.0	715.3	2537	2593	3942
1620.0	660.1	2454	2498	3214	1820.0	716.8	2539	2595	3428
1625.0	661.6	2456	2500	3412	1825.0	718.2	2541	2597	3422
1630.0	663.1	2458	2502	3214	1830.0	719.7	2543	2599	3455
1635.0	664.6	2460	2505	3336	1835.0	721.0	2545	2601	3704
1640.0	666.1	2462	2507	3463	1840.0	722.5	2547	2604	3466
1645.0	667.5	2464	2509	3396	1845.0	723.8	2549	2606	3698
1650.0	669.0	2466	2512	3456	1850.0	725.2	2551	2609	3751
1655.0	670.5	2468	2514	3293	1855.0	726.6	2553	2611	3609
1660.0	672.0	2470	2516	3362	1860.0	728.0	2555	2613	3442
1665.0	673.4	2472	2519	3516	1865.0	729.5	2557	2615	3408
1670.0	674.9	2474	2521	3360	1870.0	730.8	2559	2617	3632
1675.0	676.3	2477	2523	3599	1875.0	732.2	2561	2619	3629
1680.0	677.6	2479	2527	3921	1880.0	733.6	2563	2622	3752
1685.0	678.9	2482	2530	3795	1885.0	734.9	2565	2624	3682
1690.0	680.2	2484	2533	3684	1890.0	736.3	2567	2626	3582
1695.0	681.6	2487	2536	3776	1895.0	737.6	2569	2629	3825
1700.0	683.1	2489	2538	3246	1900.0	739.1	2571	2631	3396
1705.0	684.6	2491	2540	3366	1905.0	740.4	2573	2633	3693
1710.0	686.1	2492	2542	3401	1910.0	741.8	2575	2635	3657
1715.0	687.4	2495	2545	3761	1915.0	743.2	2577	2637	3587
1720.0	688.8	2497	2547	3655	1920.0	744.6	2578	2639	3538
1725.0	690.1	2500	2550	3750	1925.0	746.0	2580	2641	3677
1730.0	691.4	2502	2553	3701	1930.0	747.3	2582	2644	3660
1735.0	692.8	2504	2556	3599	1935.0	748.7	2584	2646	3707
1740.0	694.2	2506	2558	3593	1940.0	750.0	2587	2648	3817
1745.0	695.6	2508	2560	3515	1945.0	751.3	2589	2651	3926
1750.0	697.1	2511	2563	3530	1950.0	752.6	2591	2654	3926
1755.0	698.4	2513	2565	3754	1955.0	753.9	2593	2656	3791
1760.0	699.9	2515	2567	3355	1960.0	755.2	2595	2659	3821
1765.0	701.3	2517	2570	3436	1965.0	756.5	2597	2661	3757
1770.0	702.7	2519	2572	3603	1970.0	757.9	2599	2663	3728
1775.0	704.2	2521	2574	3399	1975.0	759.1	2602	2666	3884
1780.0	705.7	2522	2576	3328	1980.0	760.4	2604	2668	3909
1785.0	707.2	2524	2578	3402	1985.0	761.7	2606	2671	3933
1790.0	708.6	2526	2580	3615	1990.0	763.0	2608	2673	3761
1795.0	710.0	2528	2583	3582	1995.0	764.4	2610	2676	3715
1800.0	711.3	2531	2585	3649	2000.0	765.6	2612	2678	3921

Well : WINDERMERE #2 Client : MINORA
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 265.0 to 3530.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
2005.0	766.9	2614	2681	3928	2205.0	819.4	2691	2767	3680
2010.0	768.2	2617	2683	3958	2210.0	820.7	2693	2769	3737
2015.0	769.7	2618	2685	3291	2215.0	822.0	2695	2771	3858
2020.0	771.1	2620	2687	3657	2220.0	823.3	2697	2773	3926
2025.0	772.4	2622	2689	3849	2225.0	824.5	2699	2776	4030
2030.0	773.7	2624	2691	3780	2230.0	825.8	2700	2778	3924
2035.0	775.0	2626	2693	3776	2235.0	827.0	2703	2780	4187
2040.0	776.4	2627	2695	3519	2240.0	828.2	2705	2783	4038
2045.0	777.7	2629	2697	3815	2245.0	829.5	2706	2785	3796
2050.0	779.0	2631	2700	3903	2250.0	830.8	2708	2787	3911
2055.0	780.3	2634	2702	3846	2255.0	832.1	2710	2789	3824
2060.0	781.6	2636	2705	3969	2260.0	833.4	2712	2791	3916
2065.0	782.9	2638	2707	3733	2265.0	834.7	2714	2793	3993
2070.0	784.2	2640	2709	3804	2270.0	835.9	2716	2795	4051
2075.0	785.5	2642	2711	3893	2275.0	837.2	2717	2797	3734
2080.0	786.8	2644	2714	3818	2280.0	838.5	2719	2799	3779
2085.0	788.0	2646	2716	4178	2285.0	839.8	2721	2801	3898
2090.0	789.4	2648	2719	3767	2290.0	841.1	2723	2803	4048
2095.0	790.7	2650	2721	3722	2295.0	842.4	2724	2805	3668
2100.0	792.0	2652	2723	3950	2300.0	843.7	2726	2807	3912
2105.0	793.2	2654	2725	4009	2305.0	845.0	2728	2808	3766
2110.0	794.6	2656	2727	3714	2310.0	846.4	2729	2810	3782
2115.0	795.8	2658	2730	4070	2315.0	847.7	2731	2812	3760
2120.0	797.0	2660	2732	4016	2320.0	848.9	2733	2814	4029
2125.0	798.3	2662	2735	3909	2325.0	850.2	2735	2816	4092
2130.0	799.5	2664	2737	4036	2330.0	851.3	2737	2819	4248
2135.0	800.9	2666	2739	3842	2335.0	852.5	2739	2822	4423
2140.0	802.2	2668	2742	3795	2340.0	853.6	2741	2824	4277
2145.0	803.4	2670	2744	4062	2345.0	854.8	2743	2826	4178
2150.0	804.7	2672	2746	3795	2350.0	856.0	2745	2829	4109
2155.0	806.0	2674	2748	3789	2355.0	857.2	2747	2831	4263
2160.0	807.4	2675	2750	3747	2360.0	858.4	2749	2833	4198
2165.0	808.7	2677	2752	3749	2365.0	859.6	2751	2836	4095
2170.0	810.0	2679	2754	3747	2370.0	860.8	2753	2838	4195
2175.0	811.3	2681	2756	3845	2375.0	862.0	2755	2840	4275
2180.0	812.8	2682	2757	3424	2380.0	863.2	2757	2843	4138
2185.0	814.2	2684	2759	3680	2385.0	864.4	2759	2845	4073
2190.0	815.5	2686	2761	3769	2390.0	865.6	2761	2847	4108
2195.0	816.7	2688	2763	4012	2395.0	866.8	2763	2849	4195
2200.0	818.0	2689	2766	3919	2400.0	868.0	2765	2851	4152

Well : WINDERMERE #2 Client : MINORA
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 265.0 to 3530.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
2405.0	869.2	2767	2854	4148	2605.0	916.8	2842	2939	4291
2410.0	870.5	2769	2856	3992	2610.0	918.0	2843	2941	4137
2415.0	871.7	2770	2858	4134	2615.0	919.2	2845	2943	4230
2420.0	872.9	2772	2860	4271	2620.0	920.3	2847	2945	4242
2425.0	874.0	2775	2863	4478	2625.0	921.5	2849	2948	4320
2430.0	875.2	2777	2865	4312	2630.0	922.7	2850	2950	4240
2435.0	876.4	2779	2867	4138	2635.0	923.8	2852	2952	4354
2440.0	877.5	2781	2870	4269	2640.0	925.1	2854	2953	3977
2445.0	878.7	2782	2872	4245	2645.0	926.3	2856	2955	4210
2450.0	879.9	2784	2874	4112	2650.0	927.5	2857	2957	4023
2455.0	881.1	2786	2876	4143	2655.0	928.7	2859	2959	4066
2460.0	882.3	2788	2878	4121	2660.0	930.0	2860	2960	3977
2465.0	883.5	2790	2880	4203	2665.0	931.2	2862	2962	4174
2470.0	884.7	2792	2883	4207	2670.0	932.4	2864	2964	4216
2475.0	885.9	2794	2885	4233	2675.0	933.7	2865	2966	3891
2480.0	887.0	2796	2888	4521	2680.0	934.9	2867	2968	4176
2485.0	888.2	2798	2890	4313	2685.0	936.1	2868	2969	4141
2490.0	889.3	2800	2892	4339	2690.0	937.3	2870	2971	4133
2495.0	890.5	2802	2894	4285	2695.0	938.4	2872	2973	4431
2500.0	891.7	2804	2897	4160	2700.0	939.5	2874	2975	4425
2505.0	892.9	2805	2899	4132	2705.0	940.7	2875	2977	4260
2510.0	894.2	2807	2900	3980	2710.0	941.8	2877	2980	4597
2515.0	895.4	2809	2902	4074	2715.0	942.9	2879	2982	4400
2520.0	896.6	2811	2904	4068	2720.0	944.0	2881	2984	4482
2525.0	897.8	2812	2906	4134	2725.0	945.2	2883	2986	4320
2530.0	899.1	2814	2908	4018	2730.0	946.3	2885	2989	4627
2535.0	900.2	2816	2910	4267	2735.0	947.4	2887	2991	4395
2540.0	901.4	2818	2912	4225	2740.0	948.6	2889	2993	4406
2545.0	902.6	2820	2915	4293	2745.0	949.7	2891	2995	4541
2550.0	903.7	2822	2917	4465	2750.0	950.8	2892	2997	4495
2555.0	904.9	2824	2919	4329	2755.0	951.9	2894	2999	4436
2560.0	906.1	2825	2921	4198	2760.0	953.0	2896	3001	4416
2565.0	907.3	2827	2923	3981	2765.0	954.1	2898	3004	4541
2570.0	908.5	2829	2925	4038	2770.0	955.2	2900	3006	4477
2575.0	909.7	2831	2927	4378	2775.0	956.4	2902	3008	4370
2580.0	910.8	2833	2929	4412	2780.0	957.5	2903	3010	4513
2585.0	912.0	2834	2931	4177	2785.0	958.6	2905	3012	4487
2590.0	913.2	2836	2933	4118	2790.0	959.8	2907	3014	4387
2595.0	914.4	2838	2935	4223	2795.0	960.9	2909	3016	4461
2600.0	915.6	2840	2937	4238	2800.0	962.0	2911	3018	4555

Well : WINDERMERE #2 Client : MINORA
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 265.0 to 3530.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
2805.0	963.1	2912	3020	4431
2810.0	964.2	2914	3023	4529
2815.0	965.4	2916	3024	4307
2820.0	966.5	2918	3026	4349
2825.0	967.6	2920	3029	4599
2830.0	968.7	2921	3030	4373
2835.0	969.9	2923	3032	4394
2840.0	971.0	2925	3034	4452
2845.0	972.2	2927	3036	4374
2850.0	973.4	2928	3038	4126
2855.0	974.5	2930	3040	4254
2860.0	975.7	2931	3042	4253
2865.0	976.9	2933	3043	4370
2870.0	978.0	2934	3045	4264
2875.0	979.3	2936	3046	3896
2880.0	980.5	2937	3048	4278
2885.0	981.6	2939	3050	4337
2890.0	982.8	2941	3052	4479
2895.0	983.9	2942	3054	4350
2900.0	985.0	2944	3056	4525
2905.0	986.2	2946	3057	4109
2910.0	987.5	2947	3059	3985
2915.0	988.8	2948	3060	3707
2920.0	990.0	2950	3062	4312
2925.0	991.2	2951	3063	4210
2930.0	992.4	2952	3064	3963
2935.0	993.7	2954	3066	4055
2940.0	995.0	2955	3067	3887
2945.0	996.2	2956	3069	4078
2950.0	997.4	2958	3070	4200
2955.0	998.8	2958	3071	3455
2960.0	1000.0	2960	3072	4098
2965.0	1001.2	2962	3074	4411
2970.0	1002.3	2963	3076	4377
2975.0	1003.5	2965	3077	4175
2980.0	1004.7	2966	3079	4356
2985.0	1005.7	2968	3081	4655
2990.0	1006.9	2970	3083	4273
2995.0	1008.1	2971	3084	4069
3000.0	1009.2	2973	3086	4541
3005.0	1010.5	2974	3088	3965
3010.0	1011.9	2975	3088	3528
3015.0	1013.3	2975	3089	3656
3020.0	1014.5	2977	3090	4063
3025.0	1015.7	2978	3092	4205
3030.0	1017.0	2979	3093	3767
3035.0	1018.2	2981	3095	4231
3040.0	1019.5	2982	3096	3846
3045.0	1020.7	2983	3097	4191
3050.0	1021.9	2985	3098	4081
3055.0	1023.1	2986	3100	4228
3060.0	1024.3	2987	3101	4078
3065.0	1025.6	2989	3103	4087
3070.0	1026.7	2990	3104	4348
3075.0	1027.9	2991	3106	4112
3080.0	1029.1	2993	3107	4154
3085.0	1030.3	2994	3109	4347
3090.0	1031.4	2996	3111	4362
3095.0	1032.6	2997	3112	4375
3100.0	1033.8	2999	3114	4201
3105.0	1034.9	3000	3115	4268
3110.0	1036.1	3002	3117	4367
3115.0	1037.2	3003	3119	4441
3120.0	1038.4	3005	3120	4328
3125.0	1039.5	3006	3122	4211
3130.0	1040.8	3007	3123	3829
3135.0	1042.1	3008	3124	4108
3140.0	1043.2	3010	3126	4264
3145.0	1044.4	3011	3127	4329
3150.0	1045.5	3013	3129	4342
3155.0	1046.6	3014	3131	4560
3160.0	1047.8	3016	3132	4411
3165.0	1048.9	3017	3134	4468
3170.0	1050.0	3019	3136	4363
3175.0	1051.2	3020	3137	4252
3180.0	1052.4	3022	3139	4302
3185.0	1053.5	3023	3140	4526
3190.0	1054.6	3025	3142	4661
3195.0	1055.6	3027	3144	4613
3200.0	1056.8	3028	3146	4489

Well : WINDERMERE #2 Client : MINORA
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 265.0 to 3530.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
3205.0	1057.9	3030	3147	4400	3370.0	1092.1	3086	3214	4881
3210.0	1059.0	3031	3149	4706	3375.0	1093.1	3087	3215	4652
3215.0	1060.1	3033	3151	4378	3380.0	1094.2	3089	3217	4943
3220.0	1061.2	3034	3153	4657	3385.0	1095.2	3091	3219	4937
3225.0	1062.2	3036	3155	4702	3390.0	1096.3	3092	3221	4632
3230.0	1063.3	3038	3157	4819	3395.0	1097.3	3094	3223	4828
3235.0	1064.4	3039	3159	4509	3400.0	1098.3	3096	3225	5030
3240.0	1065.5	3041	3160	4566	3405.0	1099.4	3097	3227	4677
3245.0	1066.5	3043	3162	4887	3410.0	1100.4	3099	3229	4837
3250.0	1067.5	3044	3165	4891	3415.0	1101.4	3101	3231	4783
3255.0	1068.5	3046	3167	4854	3420.0	1102.5	3102	3232	4754
3260.0	1069.6	3048	3169	4949	3425.0	1103.5	3104	3234	4703
3265.0	1070.6	3050	3171	4723	3430.0	1104.6	3105	3236	4791
3270.0	1071.7	3051	3173	4782	3435.0	1105.6	3107	3238	4725
3275.0	1072.7	3053	3174	4638	3440.0	1106.7	3108	3240	4891
3280.0	1073.8	3055	3176	4664	3445.0	1107.8	3110	3241	4609
3285.0	1074.9	3056	3178	4745	3450.0	1108.8	3111	3243	4723
3290.0	1076.0	3058	3180	4566	3455.0	1109.9	3113	3245	4762
3295.0	1077.0	3059	3182	4779	3460.0	1111.0	3114	3246	4570
3300.0	1078.0	3061	3184	4897	3465.0	1112.0	3116	3248	4782
3305.0	1079.1	3063	3186	4578	3470.0	1113.1	3118	3250	4737
3310.0	1080.2	3064	3187	4555	3475.0	1114.1	3119	3252	4961
3315.0	1081.2	3066	3189	4959	3480.0	1115.1	3121	3254	5046
3320.0	1082.2	3068	3192	5130	3485.0	1116.0	3123	3256	5038
3325.0	1083.2	3070	3194	5096	3490.0	1117.0	3124	3258	5021
3330.0	1084.1	3072	3196	5170	3495.0	1118.0	3126	3260	5176
3335.0	1085.2	3073	3198	4989	3500.0	1119.0	3128	3262	5176
3340.0	1086.1	3075	3201	5182	3505.0	1119.9	3130	3264	5274
3345.0	1087.1	3077	3203	5253	3510.0	1120.9	3131	3266	4921
3350.0	1088.0	3079	3205	5223	3515.0	1122.0	3133	3268	4914
3355.0	1089.0	3081	3208	5036	3520.0	1123.0	3135	3270	4918
3360.0	1090.0	3083	3210	5002	3525.0	1124.0	3136	3272	4920
3365.0	1091.0	3084	3212	4843	3530.0	1125.0	3138	3274	4922

Velocity Data Pty Ltd

WELL VELOCITY SURVEY

CLIENT : MINORA
WELL IDENTIFICATION : WINDERMERE #2
SURVEY DATE : 17-APR-89
SURVEY TIME : 13:28:08
SURVEY UNITS : METRES
AUTHORITY TO PROSPECT : PEP 111

WELL LATITUDE : 038 14 11
WELL LONGITUDE : 142 01 19

KELLY ELEVATION : 51.6
GROUND ELEVATION : 46.1

WEATHER : FINE

ENERGY SOURCE : AN60

CLIENT REP : MR.D. SHORT
OBSERVER : N DELFOS
SHOOTER : J.BROWN

RIG IDENTIFICATION : A.T.C.02
CASING DEPTH : 314.4
LOGGING UNIT : GEARHART DLL #3

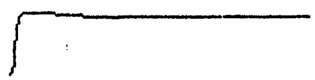
RECORDING INSTRUMENTS : VDLS11/10
SYSTEM DELAY TIME 4 MSEC.

TRACE DISPLAY.

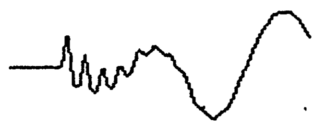
SHOT 1 Time 13:39:08 Level : 1600.0 Shot location : D
Shot depth : 1.8 Charge size : 1.0
No. surface samples : 128 Down hole sample nos : 362 400 646
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 947mV

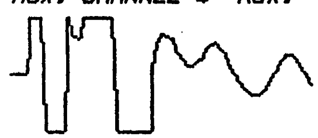
AUX. CHANNEL 2 Max. 9995mV



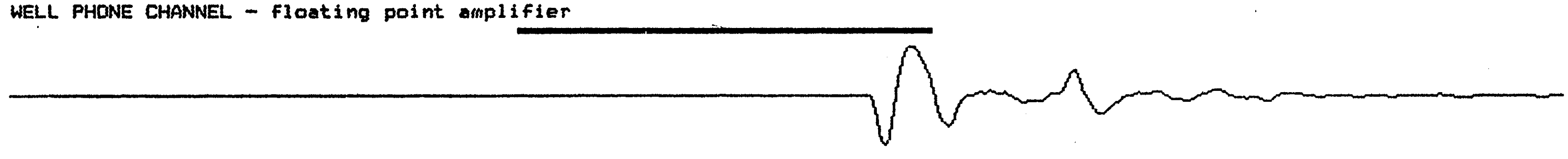
AUX. CHANNEL 3 Max. 2431mV



AUX. CHANNEL 4 Max. 10000mV



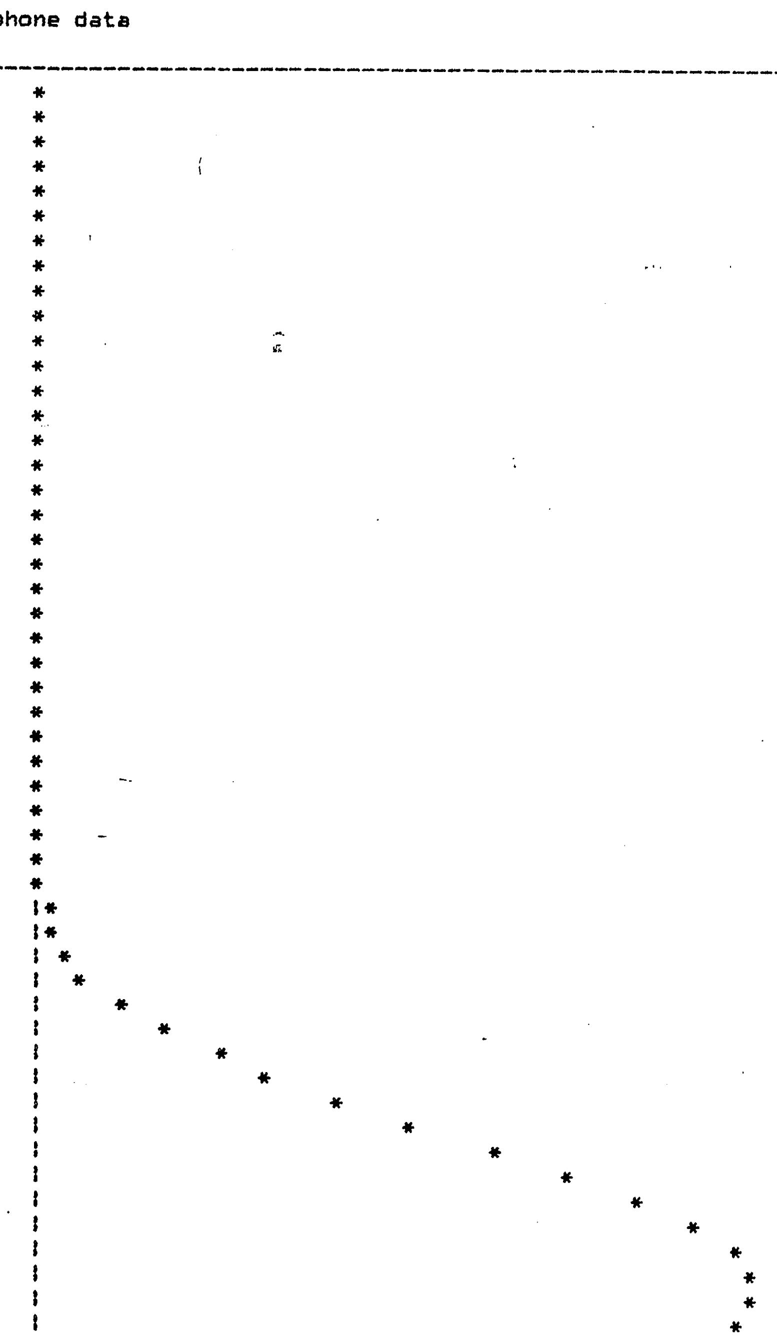
WELL PHONE CHANNEL - floating point amplifier



Data maximum (mV) : down hole channel - 14.287

FIRST ARRIVAL PLOT - Shot 1 Level 1600.0

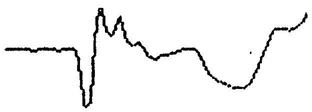
Sample time	Value uV
644.0	3.
644.5	-5.
645.0	-17.
645.5	-28.
646.0	-31.
646.5	-26.
647.0	-22.
647.5	-24.
648.0	-31.
648.5	-35.
649.0	-31.
649.5	-18.
650.0	-4.
650.5	-5.
651.0	-17.
651.5	-36.
652.0	-42.
652.5	-42.
653.0	-39.
653.5	-30.
654.0	-31.
654.5	-42.
655.0	-42.
655.5	-42.
656.0	-35.
656.5	-10.
657.0	1.
657.5	-5.
658.0	-18.
658.5	-20.
659.0	6.
659.5	45.
660.0	68.
660.5	191.
661.0	318.
661.5	577.
662.0	955.
662.5	1748.
663.0	2536.
663.5	3479.
664.0	4492.
664.5	5783.
665.0	7204.
665.5	8674.
666.0	10125.
666.5	11446.
667.0	12536.
667.5	13347.
668.0	13707.
668.5	13717.
669.0	13307.



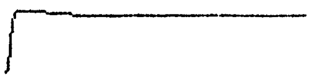
TRACE DISPLAY.

SHOT 3 Time 14:01:58 Level : 2527.0 Shot location : D
Shot depth : 1.8 Charge size : 1.0
No. surface samples : 128 Down hole sample nos : 611 400 397
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 1015mV

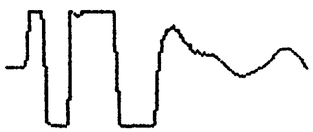


AUX. CHANNEL 2 Max. 9995mV

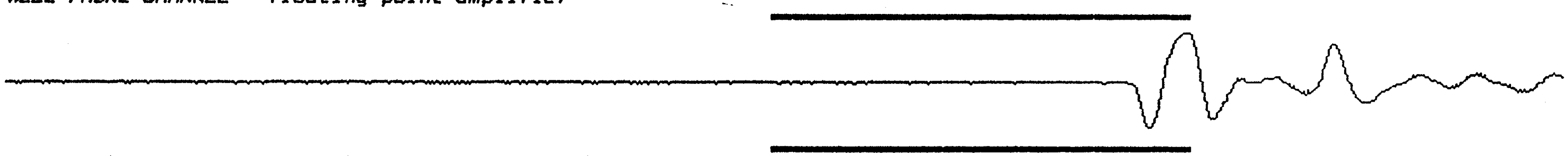


AUX. CHANNEL 3 Max. 2627mV

AUX. CHANNEL 4 Max. 10000mV



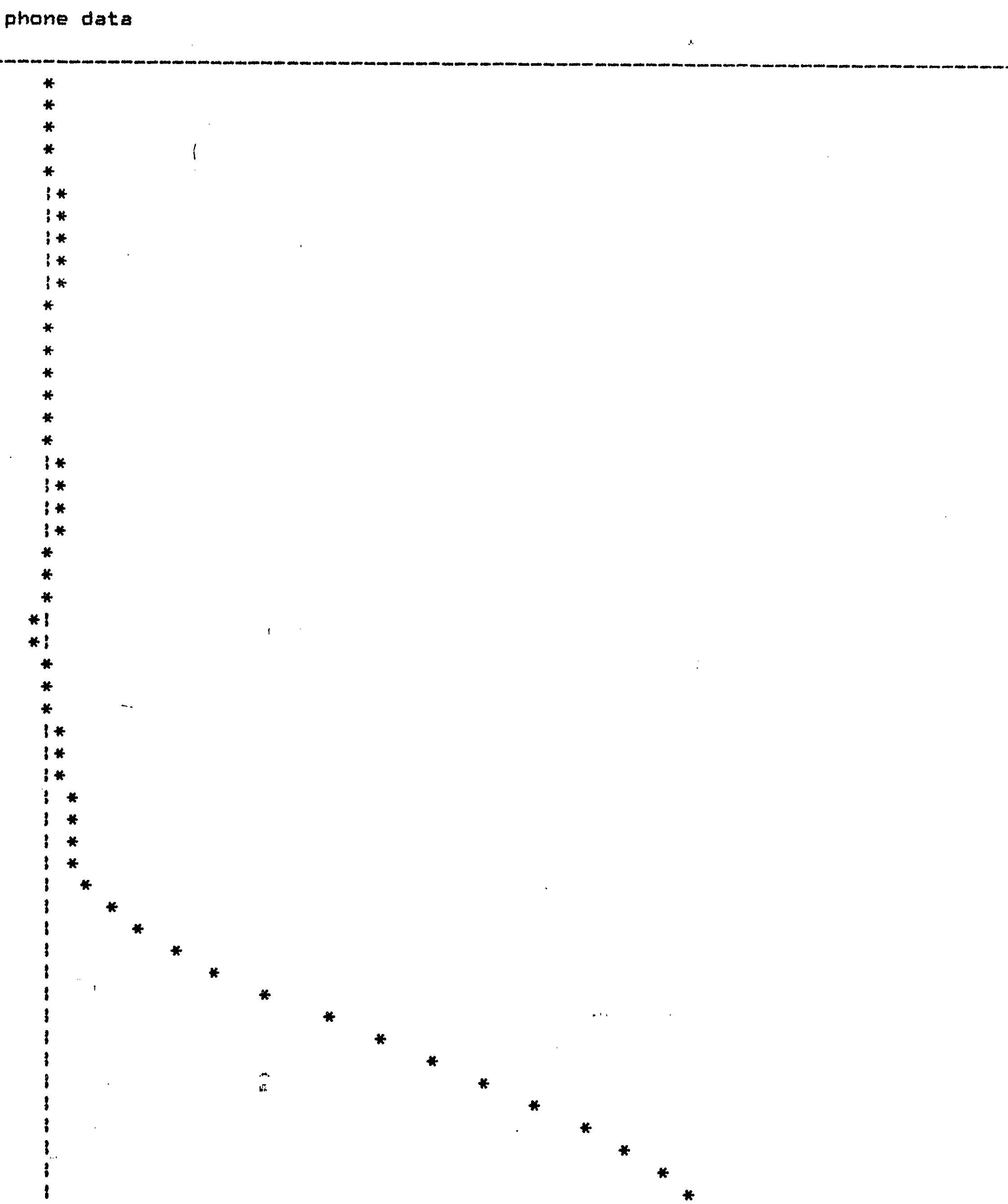
WELL PHONE CHANNEL - floating point amplifier



Data maximum (mV) : down hole channel - 3.092

FIRST ARRIVAL PLOT - Shot 3 Level 2527.0

Sample time	Value uV
894.0	-1.
894.5	0.
895.0	-0.
895.5	4.
896.0	18.
896.5	44.
897.0	73.
897.5	79.
898.0	65.
898.5	41.
899.0	5.
899.5	-17.
900.0	-28.
900.5	-25.
901.0	-13.
901.5	5.
902.0	17.
902.5	31.
903.0	43.
903.5	48.
904.0	41.
904.5	20.
905.0	-15.
905.5	-55.
906.0	-87.
906.5	-93.
907.0	-72.
907.5	-41.
908.0	12.
908.5	46.
909.0	73.
909.5	82.
910.0	83.
910.5	84.
911.0	96.
911.5	125.
912.0	182.
912.5	250.
913.0	373.
913.5	532.
914.0	724.
914.5	930.
915.0	1198.
915.5	1423.
916.0	1638.
916.5	1858.
917.0	2079.
917.5	2286.
918.0	2481.
918.5	2634.
919.0	2736.

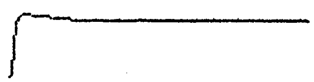


TRACE DISPLAY.

SHOT 6 Time 14:28:02 Level : 3586.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 809 400 199
Sample rates : 500 1000 usec Delay : 0

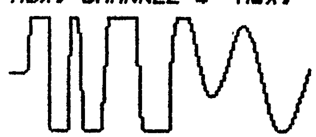
AUX. CHANNEL 1 Max. 3003mV

AUX. CHANNEL 2 Max. 9995mV

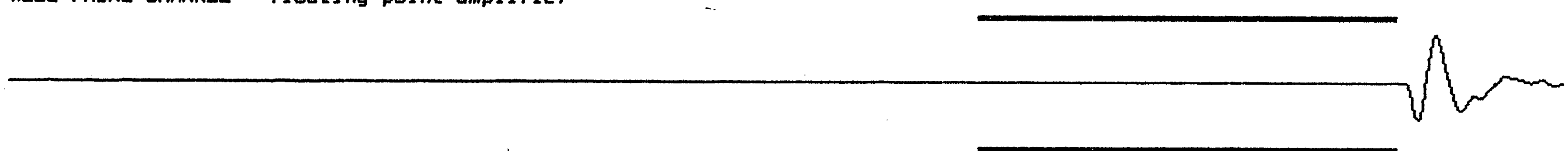


AUX. CHANNEL 3 Max. 5195mV

AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

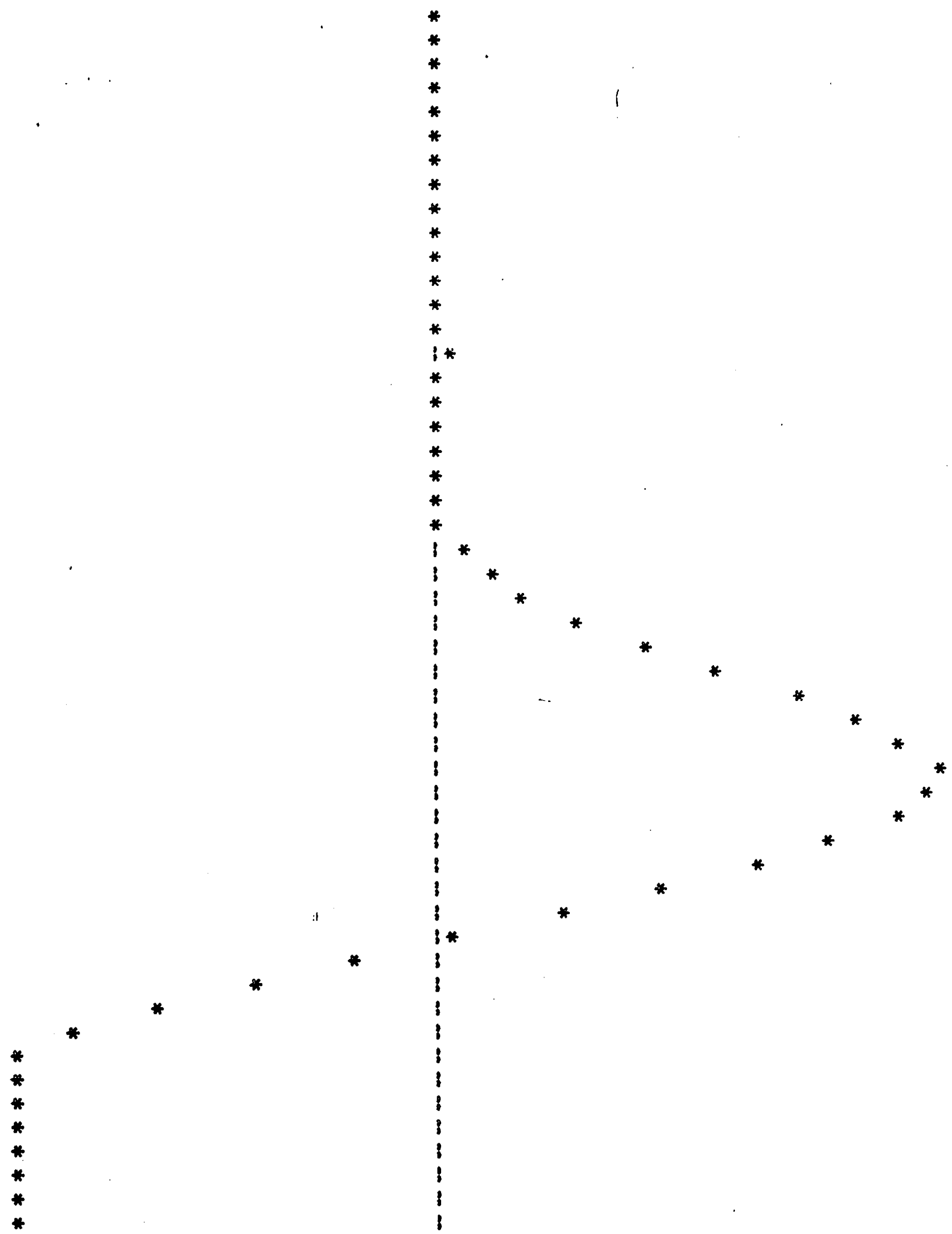


Data maximum (mV) : down hole channel - 4.452

FIRST ARRIVAL PLOT - Shot 6 Level 3586.0

Well phone data

Sample time	Value uV
1132.0	15.
1132.5	25.
1133.0	30.
1133.5	27.
1134.0	16.
1134.5	-3.
1135.0	-12.
1135.5	-13.
1136.0	0.
1136.5	13.
1137.0	28.
1138.0	40.
1139.0	29.
1140.0	27.
1141.0	46.
1142.0	41.
1143.0	7.
1144.0	6.
1145.0	35.
1146.0	33.
1147.0	-2.
1148.0	29.
1149.0	171.
1150.0	338.
1151.0	560.
1152.0	847.
1153.0	1313.
1154.0	1811.
1155.0	2281.
1156.0	2669.
1157.0	2979.
1158.0	3167.
1159.0	3159.
1160.0	2924.
1161.0	2534.
1162.0	2021.
1163.0	1423.
1164.0	787.
1165.0	58.
1166.0	-594.
1167.0	-1258.
1168.0	-1866.
1169.0	-2424.
1170.0	-2936.
1171.0	-3364.
1172.0	-3742.
1173.0	-4062.
1174.0	-4332.
1175.0	-4452.
1176.0	-4452.
1177.0	-4382.

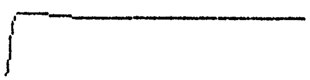


TRACE DISPLAY.

SHOT 7 Time 14:35:58 Level : 3440.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 783 400 225
Sample rates : 500 1000 usec Delay : 0

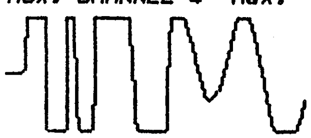
AUX. CHANNEL 1 Max. 2959mV

AUX. CHANNEL 2 Max. 9995mV

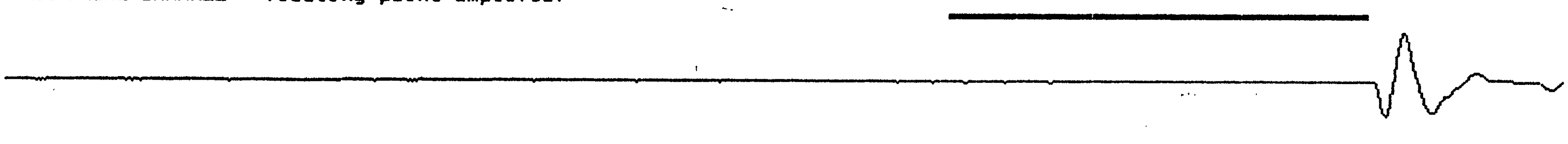


AUX. CHANNEL 3 Max. 5063mV

AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

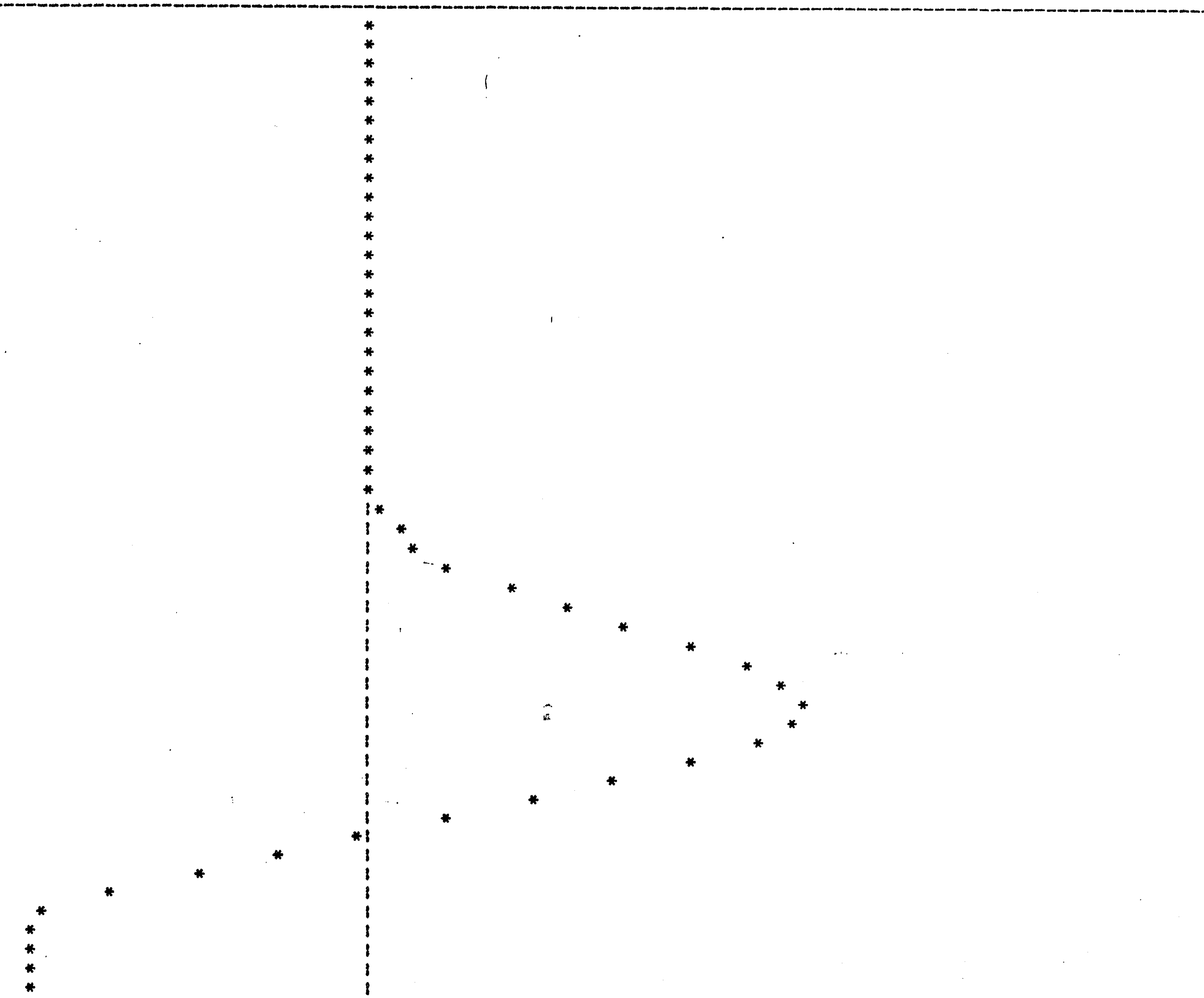


Data maximum (mV) : down hole channel - 5.323

FIRST ARRIVAL PLOT - Shot 7 Level 3440.0

Well phone data

Sample time	Value uV
1102.0	-28.
1102.5	-53.
1103.0	-48.
1103.5	-29.
1104.0	-19.
1104.5	-34.
1105.0	-71.
1105.5	-85.
1106.0	-72.
1106.5	-41.
1107.0	-5.
1107.5	2.
1108.0	-21.
1108.5	-43.
1109.0	-69.
1109.5	-57.
1110.0	-25.
1110.5	22.
1111.0	37.
1112.0	8.
1113.0	-57.
1114.0	-18.
1115.0	46.
1116.0	6.
1117.0	5.
1118.0	117.
1119.0	254.
1120.0	376.
1121.0	669.
1122.0	1171.
1123.0	1653.
1124.0	2161.
1125.0	2726.
1126.0	3194.
1127.0	3467.
1128.0	3602.
1129.0	3547.
1130.0	3254.
1131.0	2729.
1132.0	2079.
1133.0	1406.
1134.0	677.
1135.0	-184.
1136.0	-796.
1137.0	-1481.
1138.0	-2184.
1139.0	-2804.
1140.0	-3307.
1141.0	-3794.
1142.0	-4242.
1143.0	-4642.

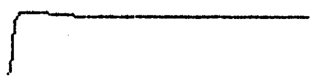


TRACE DISPLAY.

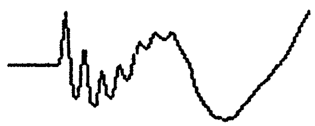
SHOT 9 Time 14:42:12 Level : 3360.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 768 400 240
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 2827mV

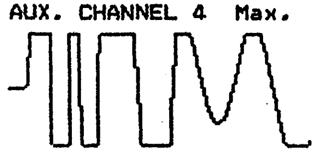
AUX. CHANNEL 2 Max. 9995mV



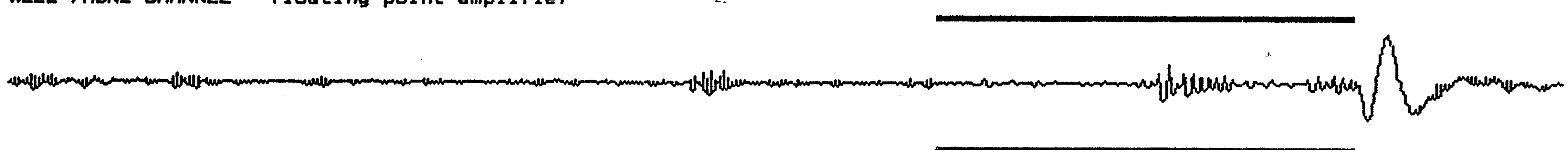
AUX. CHANNEL 3 Max. 4428mV



AUX. CHANNEL 4 Max. 10000mV



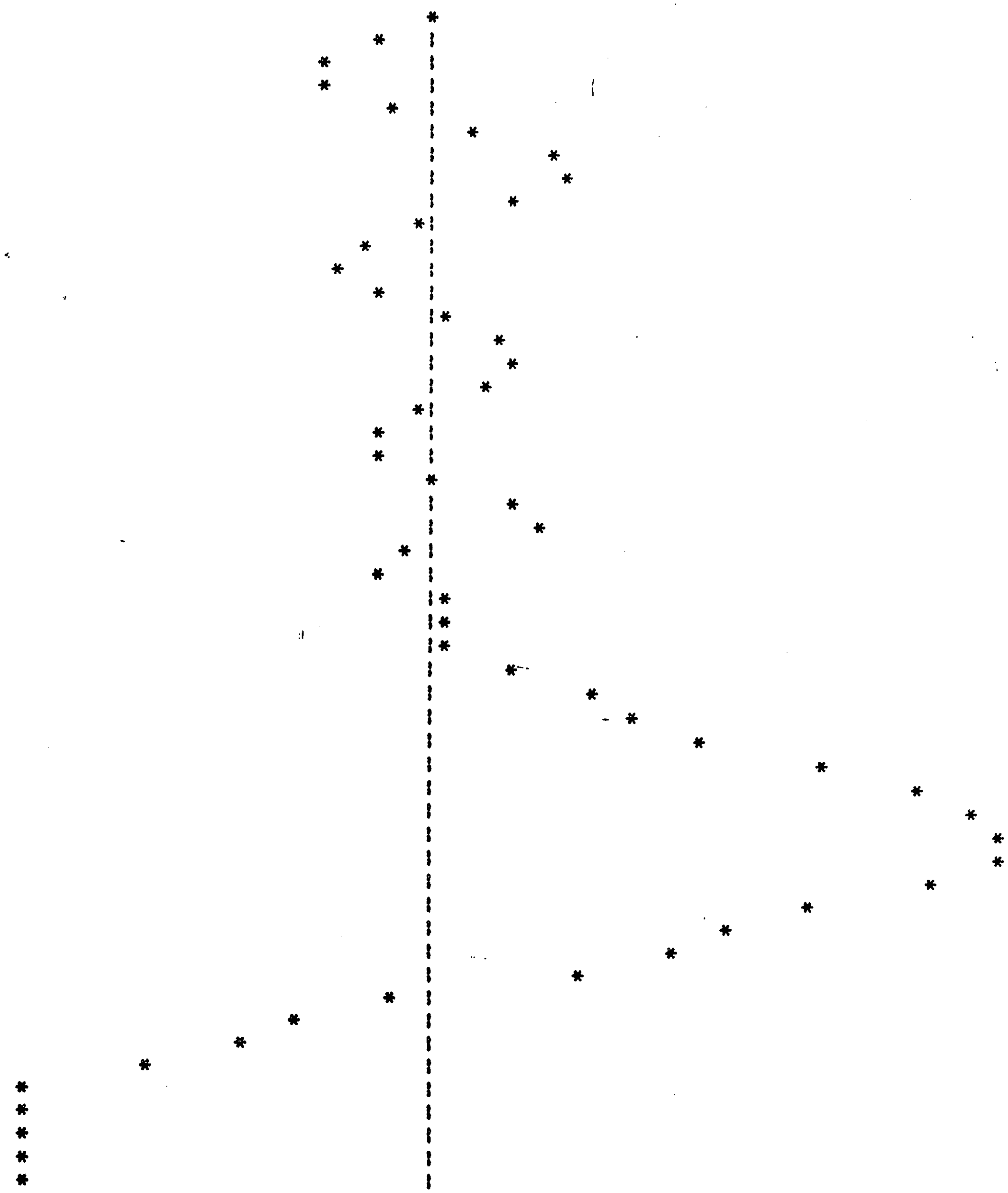
WELL PHONE CHANNEL - floating point amplifier



Data maximum (mV) : down hole channel - 5.483

FIRST ARRIVAL PLOT – Shot 9 Level 3360.0

Well phone data



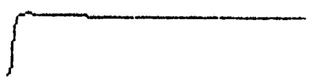
Sample time	Value uV
1086.0	-80.
1086.5	-493.
1087.0	-887.
1087.5	-877.
1088.0	-423.
1088.5	258.
1089.0	812.
1089.5	931.
1090.0	579.
1090.5	-226.
1091.0	-590.
1091.5	-761.
1092.0	-505.
1092.5	80.
1093.0	433.
1093.5	570.
1094.0	340.
1094.5	-225.
1095.0	-461.
1095.5	-511.
1096.0	-74.
1097.0	535.
1098.0	757.
1099.0	-304.
1100.0	-453.
1101.0	101.
1102.0	138.
1103.0	140.
1104.0	543.
1105.0	1108.
1106.0	1371.
1107.0	1898.
1108.0	2739.
1109.0	3414.
1110.0	3757.
1111.0	3942.
1112.0	3992.
1113.0	3514.
1114.0	2674.
1115.0	2076.
1116.0	1728.
1117.0	998.
1118.0	-349.
1119.0	-1018.
1120.0	-1461.
1121.0	-2114.
1122.0	-2936.
1123.0	-3334.
1124.0	-3502.
1125.0	-4012.
1126.0	-4712.

TRACE DISPLAY.

SHOT 10 Time 14:47:02 Level : 3360.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 768 400 240
Sample rates : 500 1000 usec Delay : 0

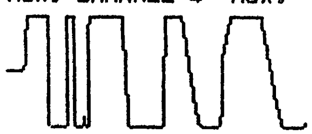
AUX. CHANNEL 1 Max. 2172mV

AUX. CHANNEL 2 Max. 9995mV

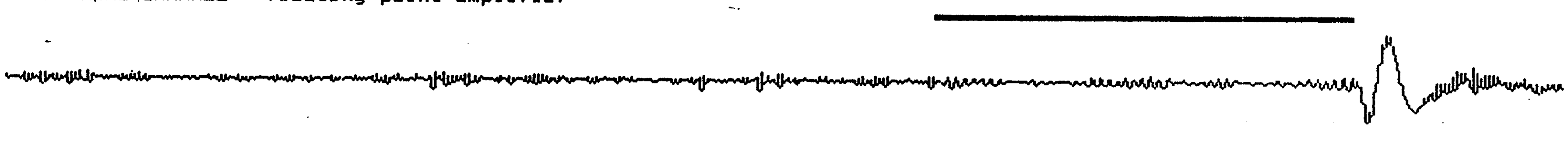


AUX. CHANNEL 3 Max. 3921mV

AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

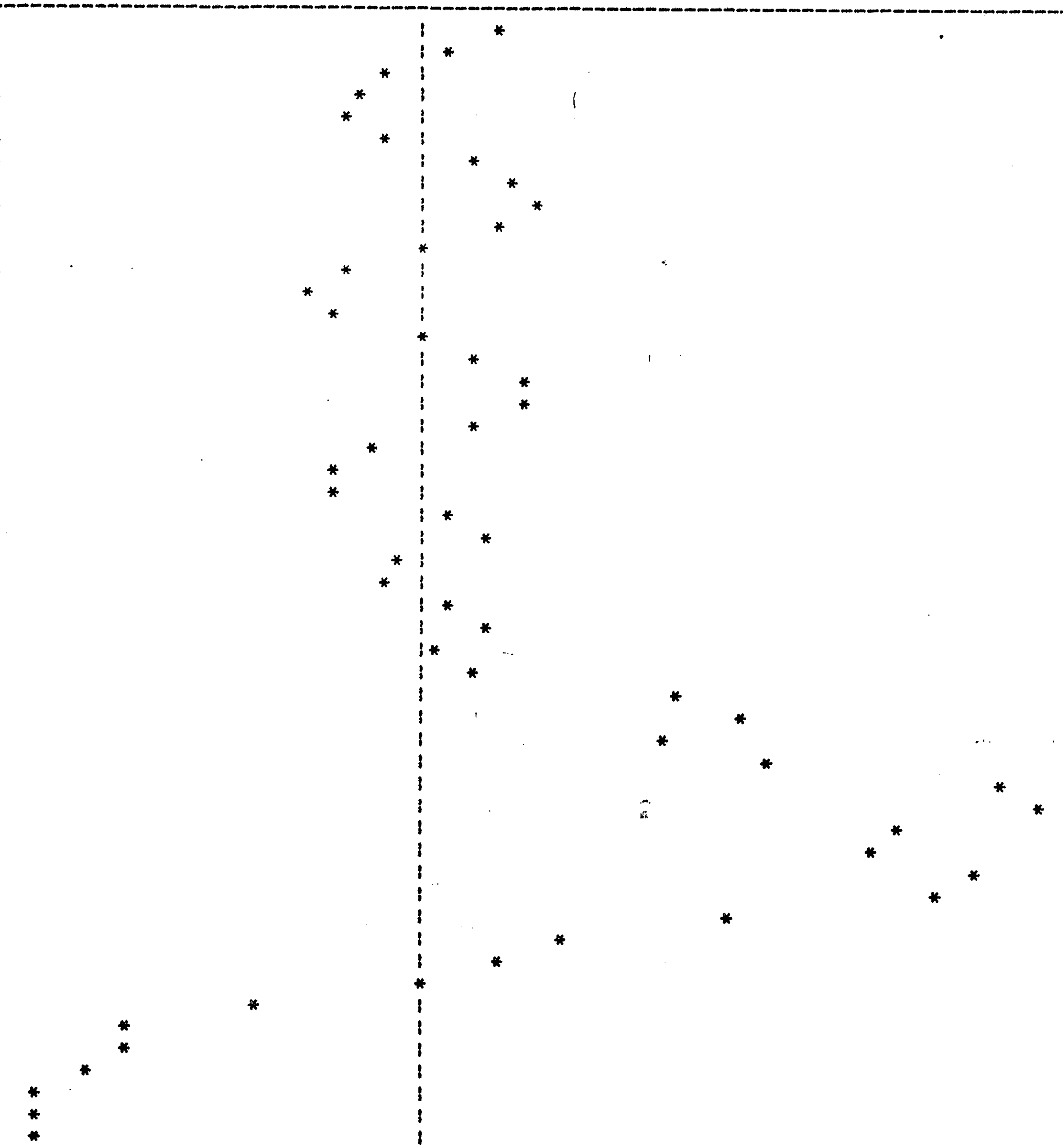


Data maximum (mV) : down hole channel - 4.762

FIRST ARRIVAL PLOT - Shot 10 Level 3360.0

Well phone data

Sample time	Value uV
1086.0	493.
1086.5	119.
1087.0	-316.
1087.5	-466.
1088.0	-519.
1088.5	-283.
1089.0	324.
1089.5	548.
1090.0	698.
1090.5	490.
1091.0	-37.
1091.5	-513.
1092.0	-767.
1092.5	-632.
1093.0	1.
1093.5	309.
1094.0	637.
1094.5	634.
1095.0	309.
1095.5	-359.
1096.0	-571.
1097.0	-636.
1098.0	180.
1099.0	343.
1100.0	-197.
1101.0	-277.
1102.0	163.
1103.0	345.
1104.0	72.
1105.0	280.
1106.0	1526.
1107.0	1886.
1108.0	1463.
1109.0	2054.
1110.0	3424.
1111.0	3637.
1112.0	2784.
1113.0	2631.
1114.0	3247.
1115.0	3072.
1116.0	1811.
1117.0	803.
1118.0	450.
1119.0	-46.
1120.0	-1088.
1121.0	-1791.
1122.0	-1796.
1123.0	-2059.
1124.0	-3056.
1125.0	-3804.
1126.0	-3654.

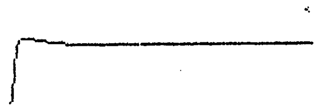


TRACE DISPLAY.

SHOT 11 Time 14:54:33 Level : 3235.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 746 400 262
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 2978mV

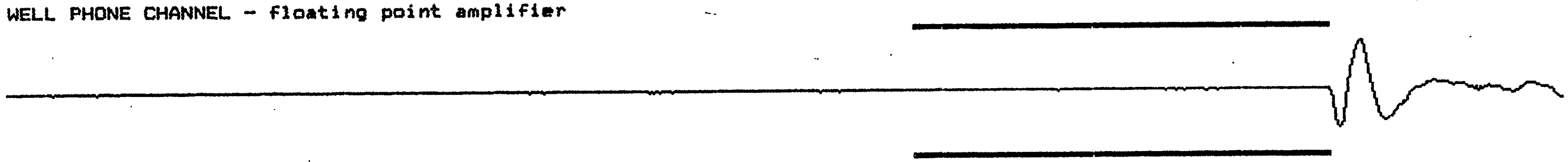
AUX. CHANNEL 2 Max. 9995mV



AUX. CHANNEL 3 Max. 4546mV

AUX. CHANNEL 4 Max. 10000mV

WELL PHONE CHANNEL - floating point amplifier

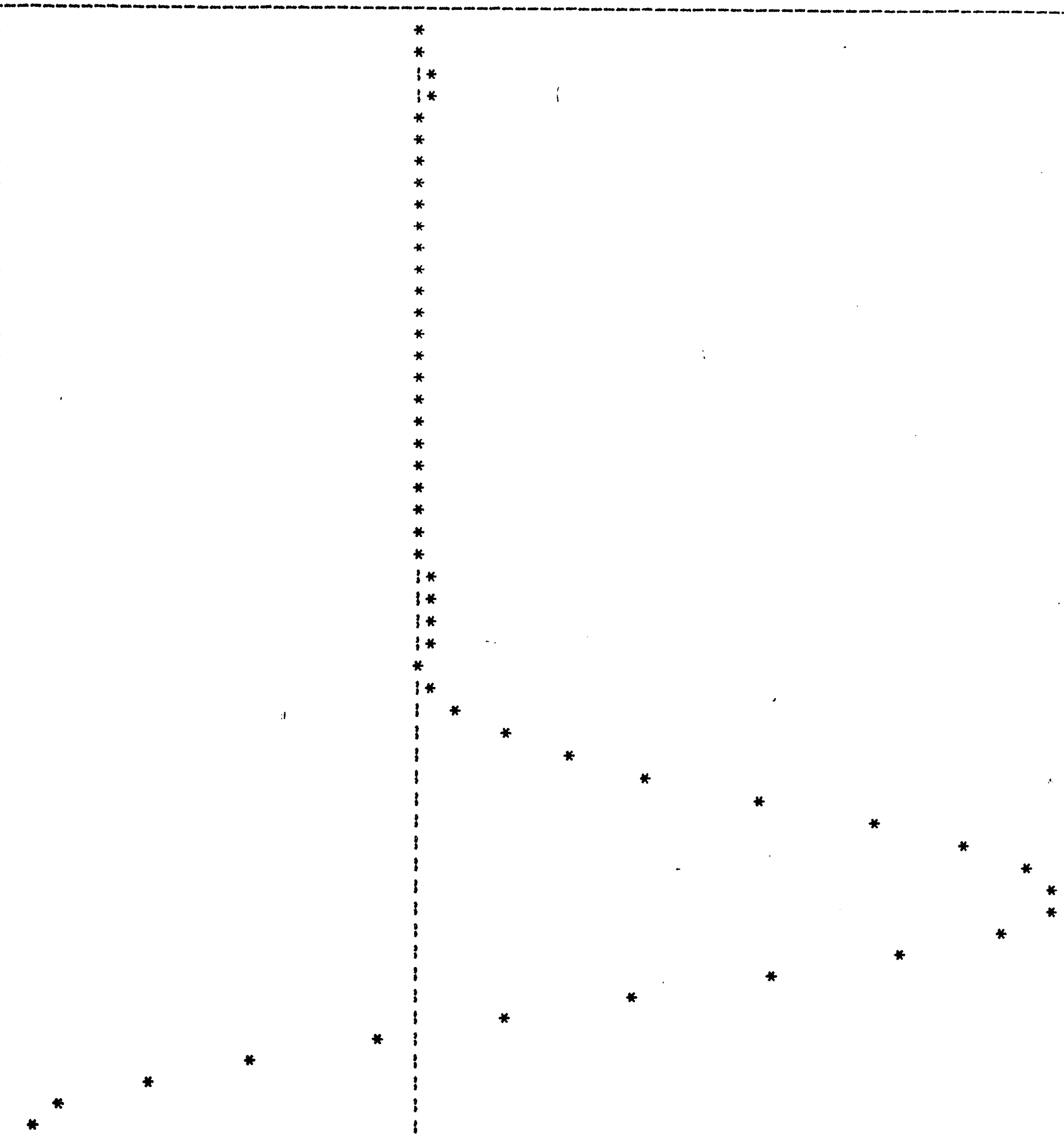


Data maximum (mV) : down hole channel - 6.073

FIRST ARRIVAL PLOT — Shot 11 Level 3235.0

Well phone data

Sample time	Value uV
1060.0	-34.
1060.5	21.
1061.0	59.
1061.5	62.
1062.0	44.
1062.5	7.
1063.0	-22.
1063.5	-48.
1064.0	-72.
1064.5	-88.
1065.0	-96.
1065.5	-93.
1066.0	-79.
1066.5	-52.
1067.0	-34.
1067.5	-6.
1068.0	6.
1068.5	-2.
1069.0	-15.
1069.5	-40.
1070.0	-59.
1070.5	-60.
1071.0	-42.
1071.5	-5.
1072.0	27.
1072.5	63.
1073.0	79.
1073.5	76.
1074.0	54.
1075.0	36.
1076.0	114.
1077.0	330.
1078.0	682.
1079.0	1168.
1080.0	1751.
1081.0	2519.
1082.0	3384.
1083.0	4062.
1084.0	4542.
1085.0	4752.
1086.0	4722.
1087.0	4372.
1088.0	3617.
1089.0	2656.
1090.0	1603.
1091.0	618.
1092.0	-386.
1093.0	-1301.
1094.0	-2076.
1095.0	-2711.
1096.0	-3254.



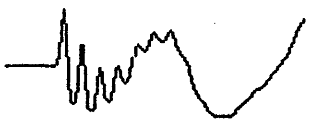
TRACE DISPLAY.

SHOT 12 Time 14:59:07 Level : 3188.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 737 400 271
Sample rates : 500 1000 usec Delay : 0

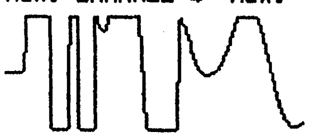
AUX. CHANNEL 1 Max. 3208mV

AUX. CHANNEL 2 Max. 9995mV

AUX. CHANNEL 3 Max. 4941mV



AUX. CHANNEL 4 Max. 10000mV



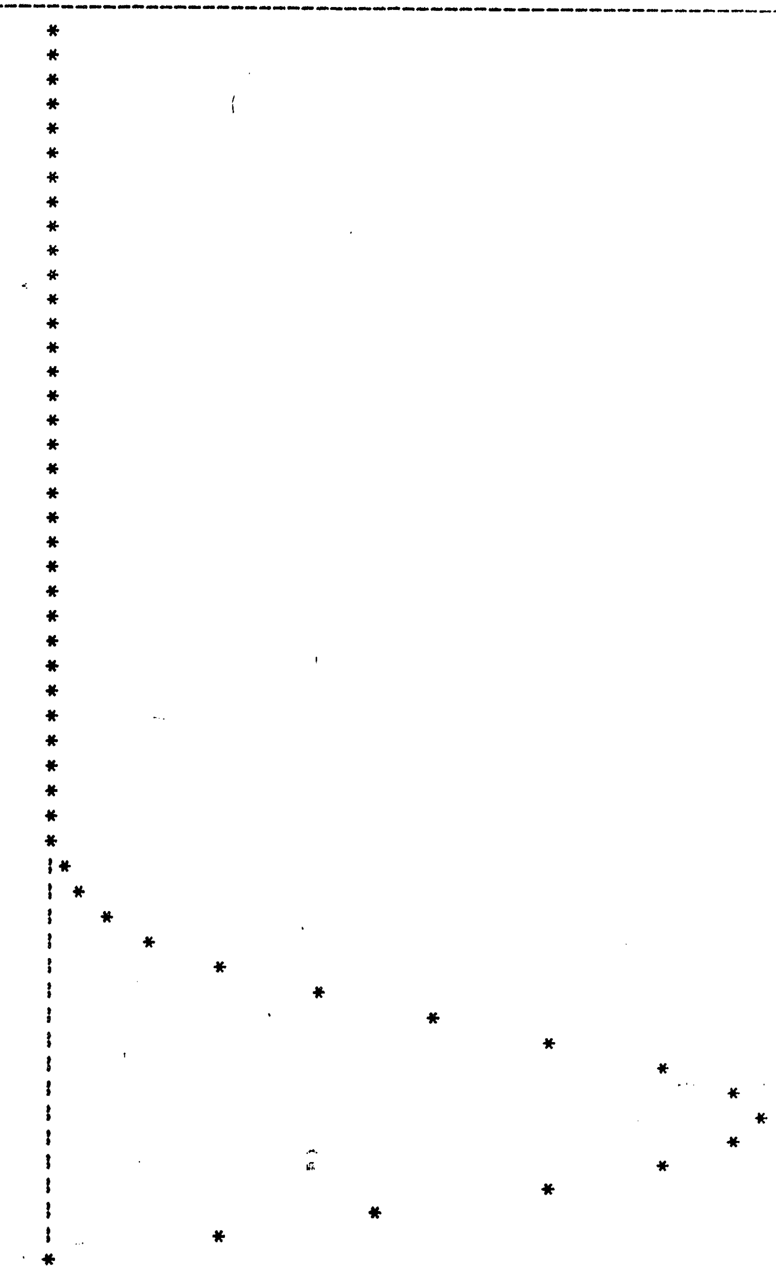
WELL PHONE CHANNEL - floating point amplifier

Data maximum (mV) : down hole channel - 7.113

FIRST ARRIVAL PLOT - Shot 12 Level 3188.0

Well phone data

Sample time	Value uV
1048.0	-29.
1048.5	-20.
1049.0	-9.
1049.5	2.
1050.0	7.
1050.5	8.
1051.0	-0.
1051.5	-8.
1052.0	-14.
1052.5	-16.
1053.0	-10.
1053.5	2.
1054.0	8.
1054.5	9.
1055.0	4.
1055.5	-7.
1056.0	-17.
1056.5	-22.
1057.0	-20.
1057.5	-9.
1058.0	6.
1058.5	16.
1059.0	26.
1059.5	28.
1060.0	24.
1060.5	16.
1061.0	5.
1061.5	-6.
1062.0	-15.
1062.5	-20.
1063.0	-19.
1063.5	-7.
1064.0	20.
1064.5	47.
1065.0	102.
1066.0	211.
1067.0	409.
1068.0	772.
1069.0	1408.
1070.0	2181.
1071.0	3089.
1072.0	3992.
1073.0	4822.
1074.0	5423.
1075.0	5663.
1076.0	5493.
1077.0	4912.
1078.0	3932.
1079.0	2654.
1080.0	1311.
1081.0	52.

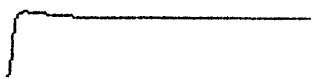


TRACE DISPLAY.

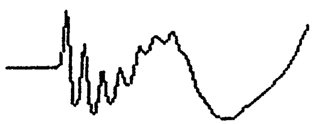
SHOT 13 Time 15:07:45 Level : 3050.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 712 400 296
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 3056mV

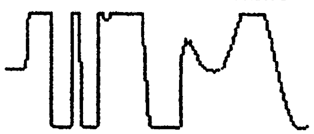
AUX. CHANNEL 2 Max. 9995mV



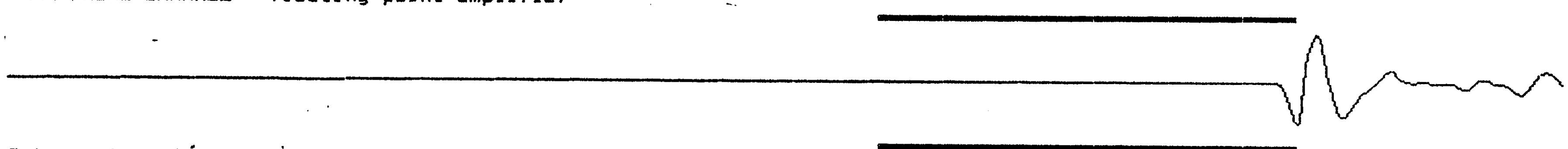
AUX. CHANNEL 3 Max. 4843mV



AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

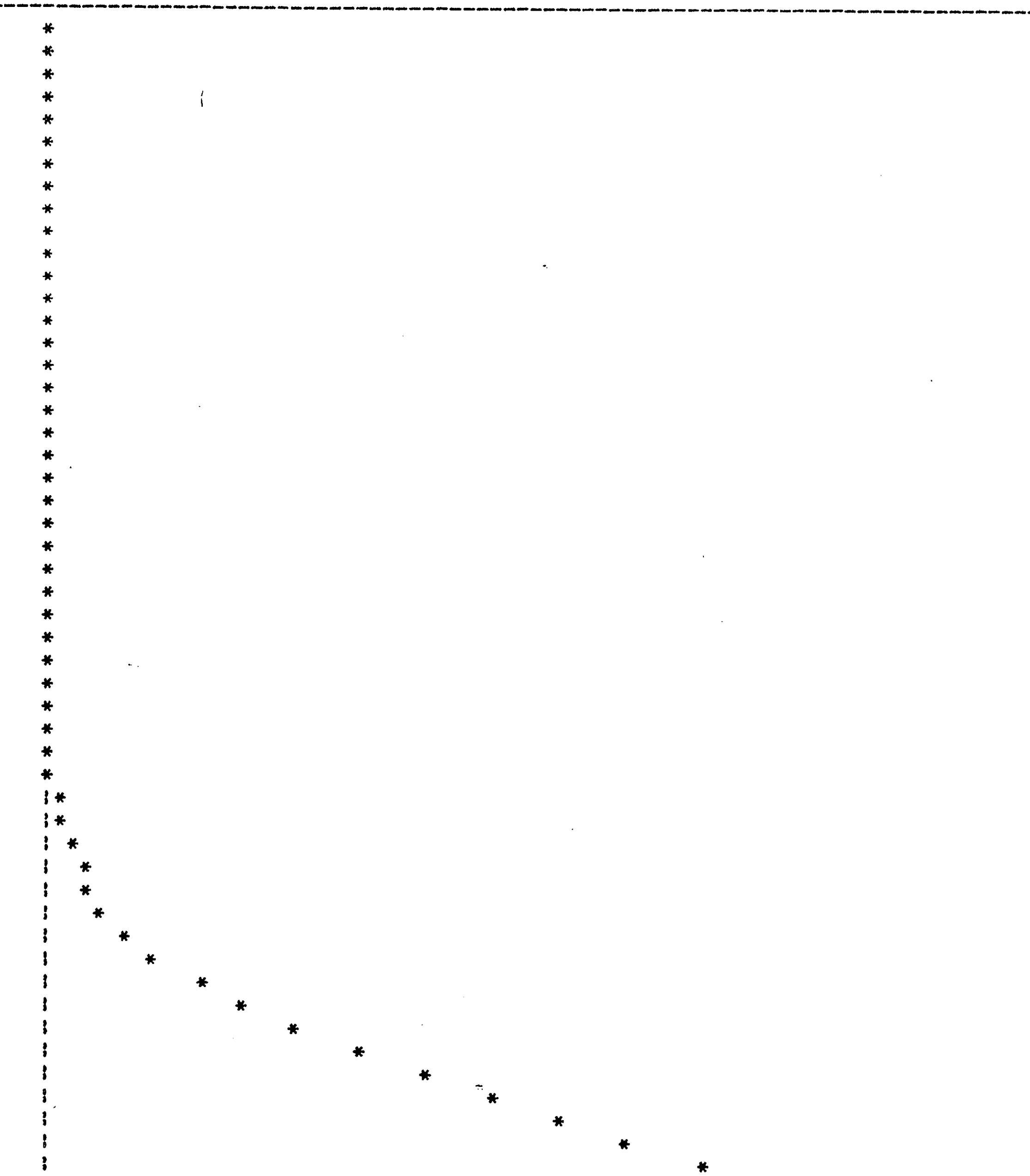


Data maximum (mV) : down hole channel - 8.194

FIRST ARRIVAL PLOT - Shot 13 Level 3050.0

Sample time	Value uV
1014.0	-5.
1014.5	-17.
1015.0	-32.
1015.5	-44.
1016.0	-50.
1016.5	-49.
1017.0	-43.
1017.5	-34.
1018.0	-25.
1018.5	-14.
1019.0	-5.
1019.5	1.
1020.0	2.
1020.5	-2.
1021.0	-10.
1021.5	-19.
1022.0	-28.
1022.5	-36.
1023.0	-40.
1023.5	-43.
1024.0	-45.
1024.5	-51.
1025.0	-55.
1025.5	-57.
1026.0	-53.
1026.5	-44.
1027.0	-33.
1027.5	-25.
1028.0	-21.
1028.5	-22.
1029.0	-23.
1029.5	-18.
1030.0	4.
1030.5	28.
1031.0	84.
1031.5	131.
1032.0	184.
1032.5	260.
1033.0	313.
1033.5	427.
1034.0	592.
1034.5	804.
1035.0	1131.
1035.5	1471.
1036.0	1858.
1036.5	2306.
1037.0	2764.
1037.5	3262.
1038.0	3807.
1038.5	4292.
1039.0	4832.

Well phone data

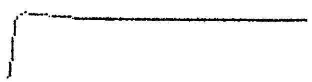


TRACE DISPLAY.

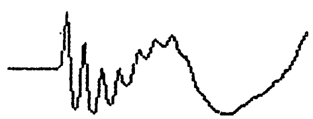
SHOT 14 Time 15:15:29 Level : 2925.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 690 400 318
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 3476mV

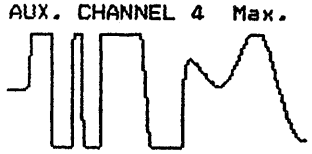
AUX. CHANNEL 2 Max. 9995mV



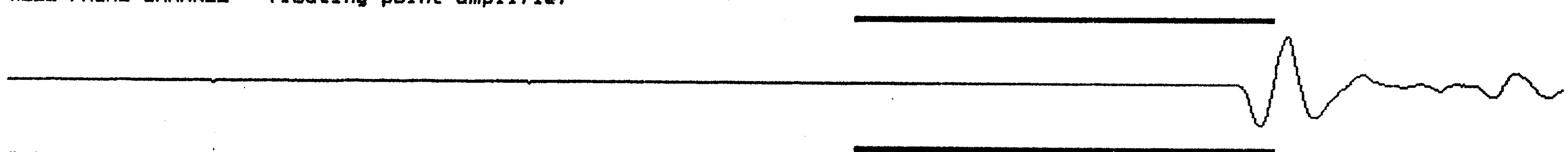
AUX. CHANNEL 3 Max. 5376mV



AUX. CHANNEL 4 Max. 10000mV



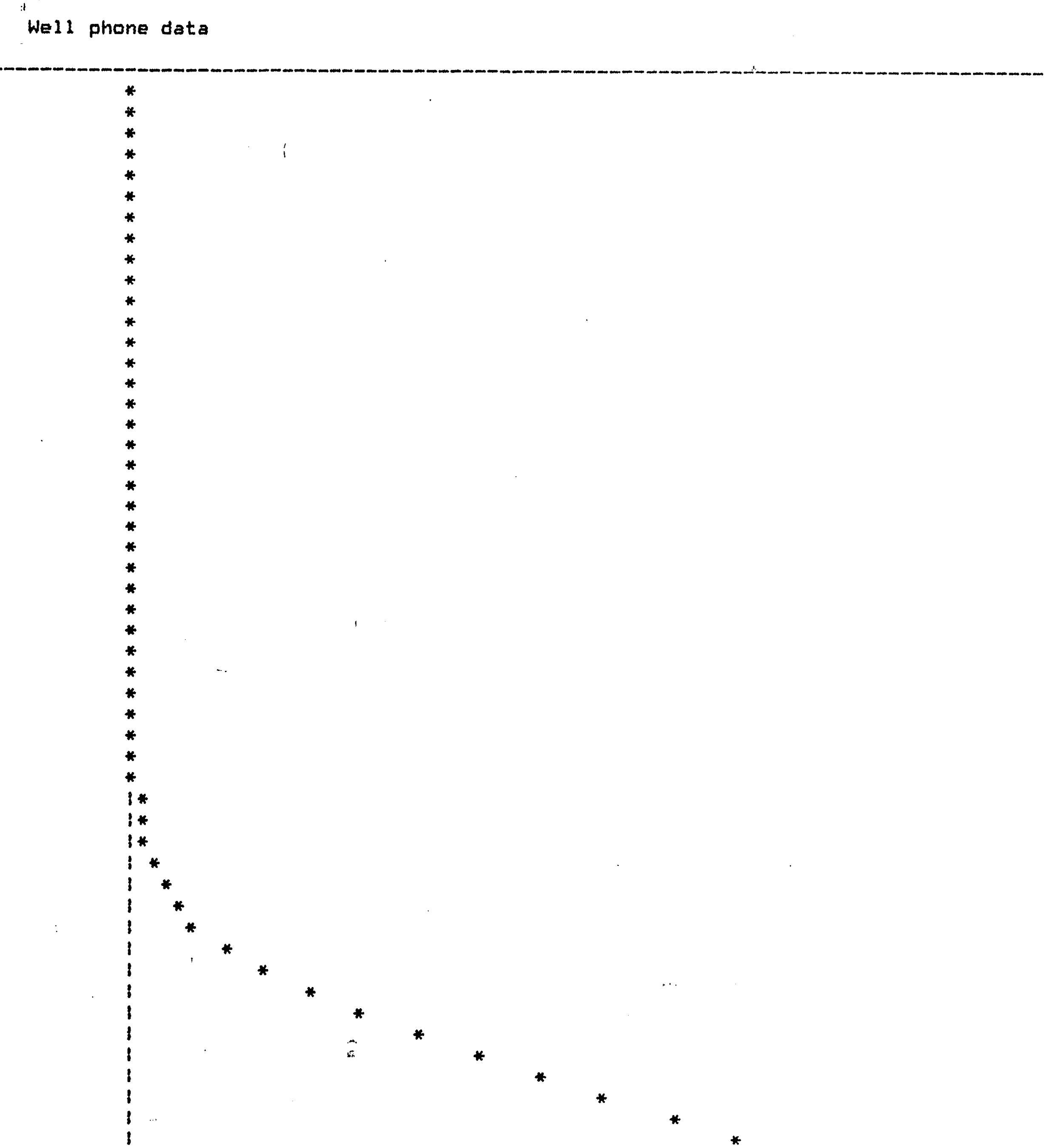
WELL PHONE CHANNEL - floating point amplifier



Data maximum (mV) : down hole channel - 8.664

FIRST ARRIVAL PLOT - Shot 14 Level 2925.0

Sample time	Value uV
984.0	-3.
984.5	-14.
985.0	-25.
985.5	-34.
986.0	-39.
986.5	-36.
987.0	-26.
987.5	-7.
988.0	8.
988.5	15.
989.0	10.
989.5	-7.
990.0	-27.
990.5	-49.
991.0	-60.
991.5	-63.
992.0	-54.
992.5	-50.
993.0	-37.
993.5	-29.
994.0	-25.
994.5	-26.
995.0	-29.
995.5	-34.
996.0	-41.
996.5	-48.
997.0	-55.
997.5	-57.
998.0	-54.
998.5	-45.
999.0	-33.
999.5	-17.
1000.0	5.
1000.5	26.
1001.0	56.
1001.5	100.
1002.0	148.
1002.5	216.
1003.0	281.
1003.5	408.
1004.0	580.
1004.5	810.
1005.0	1206.
1005.5	1593.
1006.0	2056.
1006.5	2576.
1007.0	3129.
1007.5	3727.
1008.0	4242.
1008.5	4832.
1009.0	5403.

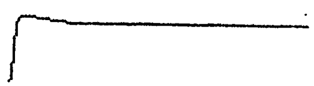


TRACE DISPLAY.

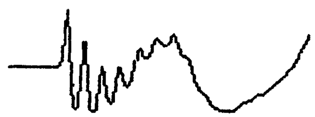
SHOT 15 Time 15:23:34 Level : 2740.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 656 400 352
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 3701mV

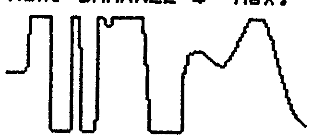
AUX. CHANNEL 2 Max. 9995mV



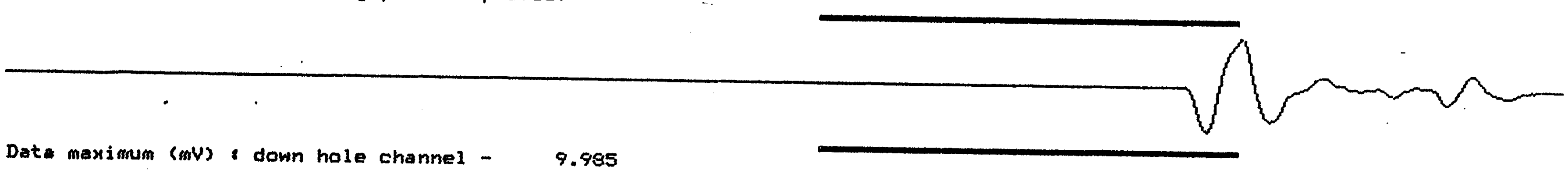
AUX. CHANNEL 3 Max. 5678mV



AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

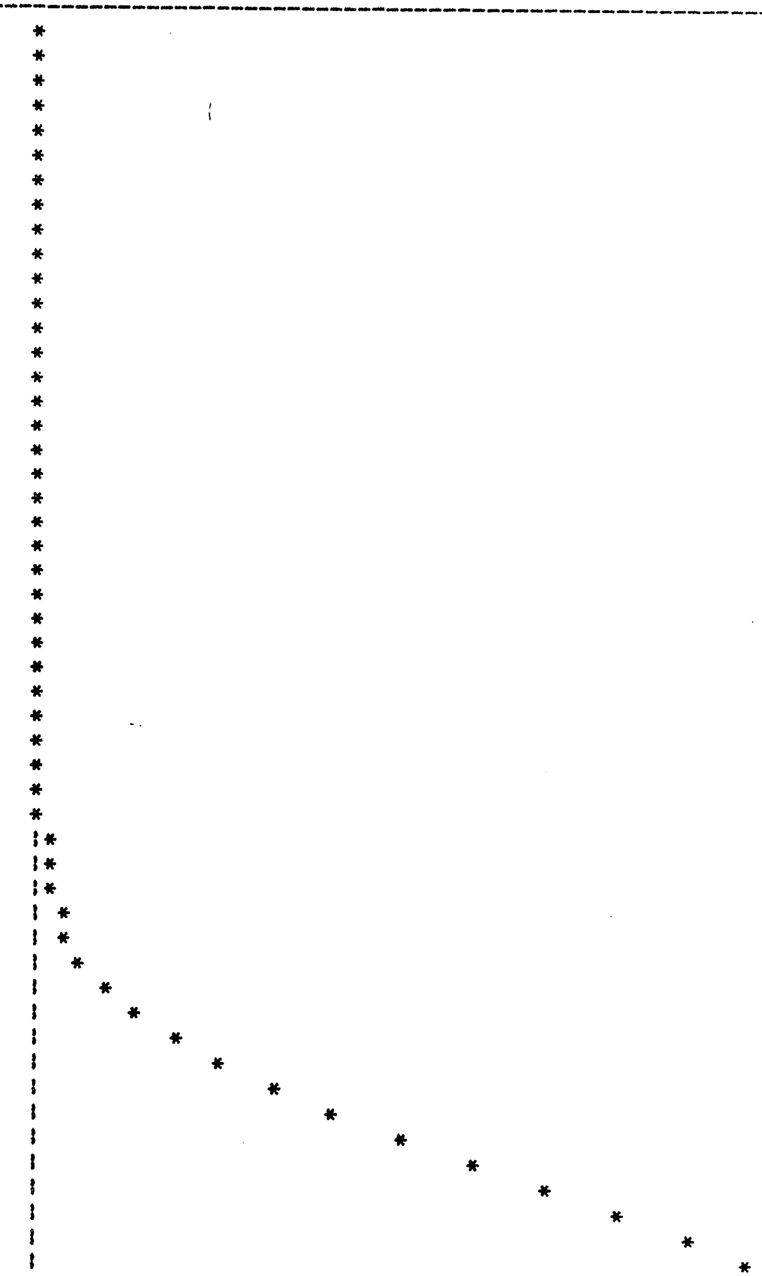


Data maximum (mV) : down hole channel - 9.985

FIRST ARRIVAL PLOT - Shot 15 Level 2740.0

Sample time	Value uV
942.0	-12.
942.5	-12.
943.0	-9.
943.5	-4.
944.0	3.
944.5	8.
945.0	12.
945.5	14.
946.0	14.
946.5	13.
947.0	10.
947.5	5.
948.0	3.
948.5	6.
949.0	15.
949.5	25.
950.0	36.
950.5	42.
951.0	40.
951.5	33.
952.0	22.
952.5	12.
953.0	7.
953.5	5.
954.0	3.
954.5	2.
955.0	1.
955.5	2.
956.0	5.
956.5	15.
957.0	27.
957.5	42.
958.0	57.
958.5	77.
959.0	108.
959.5	162.
960.0	260.
960.5	334.
961.0	503.
961.5	723.
962.0	1096.
962.5	1486.
963.0	1948.
963.5	2504.
964.0	3144.
964.5	3829.
965.0	4482.
965.5	5233.
966.0	5973.
966.5	6683.
967.0	7334.

Well phone data

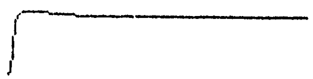


TRACE DISPLAY.

SHOT 16 Time 15:33:38 Level : 2527.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 611 400 397
Sample rates : 500 1000 usec Delay : 0

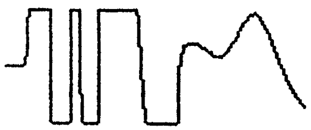
AUX. CHANNEL 1 Max. 3344mV

AUX. CHANNEL 2 Max. 9995mV

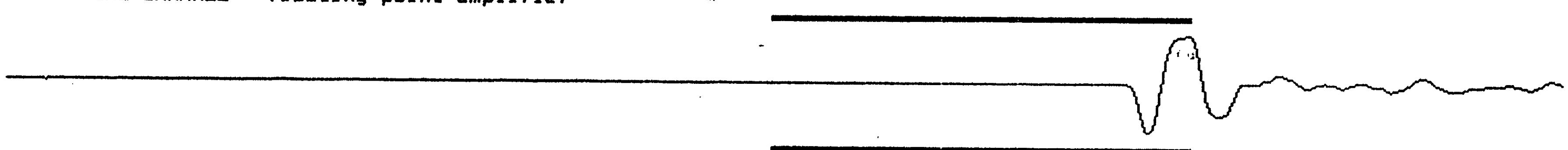


AUX. CHANNEL 3 Max. 5166mV

AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

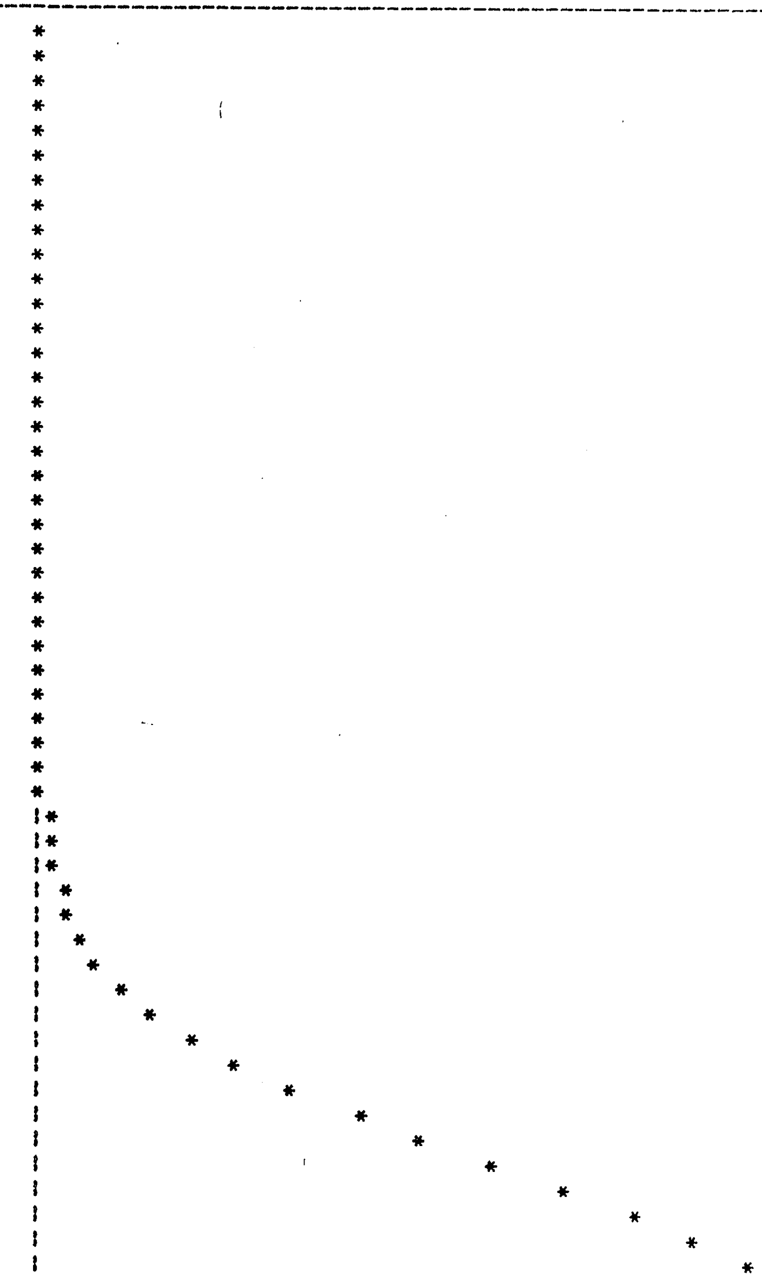


Data maximum (mV) : down hole channel - 8.354

FIRST ARRIVAL PLOT — Shot 16 Level 2527.0

Sample time	Value uV
892.0	36.
892.5	35.
893.0	33.
893.5	26.
894.0	17.
894.5	7.
895.0	2.
895.5	4.
896.0	13.
896.5	23.
897.0	32.
897.5	37.
898.0	36.
898.5	33.
899.0	33.
899.5	38.
900.0	47.
900.5	54.
901.0	55.
901.5	47.
902.0	33.
902.5	19.
903.0	6.
903.5	-3.
904.0	-10.
904.5	-16.
905.0	-19.
905.5	-19.
906.0	-9.
906.5	8.
907.0	28.
907.5	50.
908.0	94.
908.5	117.
909.0	154.
909.5	215.
910.0	285.
910.5	415.
911.0	595.
911.5	838.
912.0	1186.
912.5	1578.
913.0	2059.
913.5	2636.
914.0	3262.
914.5	3892.
915.0	4612.
915.5	5333.
916.0	6003.
916.5	6613.
917.0	7143.

Well phone data

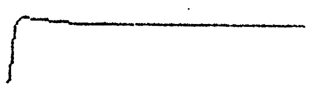


TRACE DISPLAY.

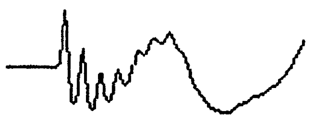
SHOT 17 Time 15:42:16 Level : 2367.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 573 400 435
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 3437mV

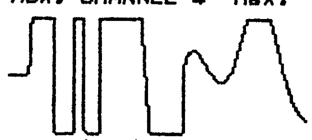
AUX. CHANNEL 2 Max. 9995mV



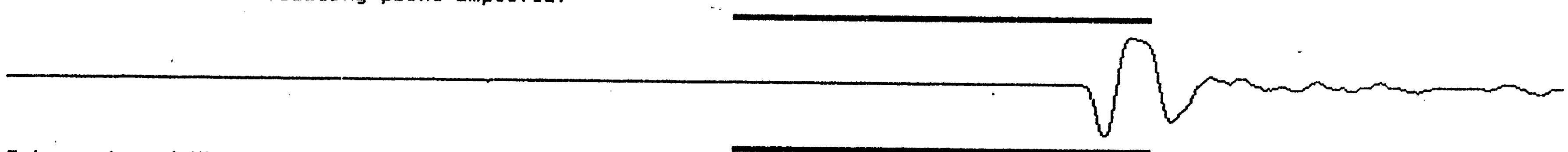
AUX. CHANNEL 3 Max. 5185mV



AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

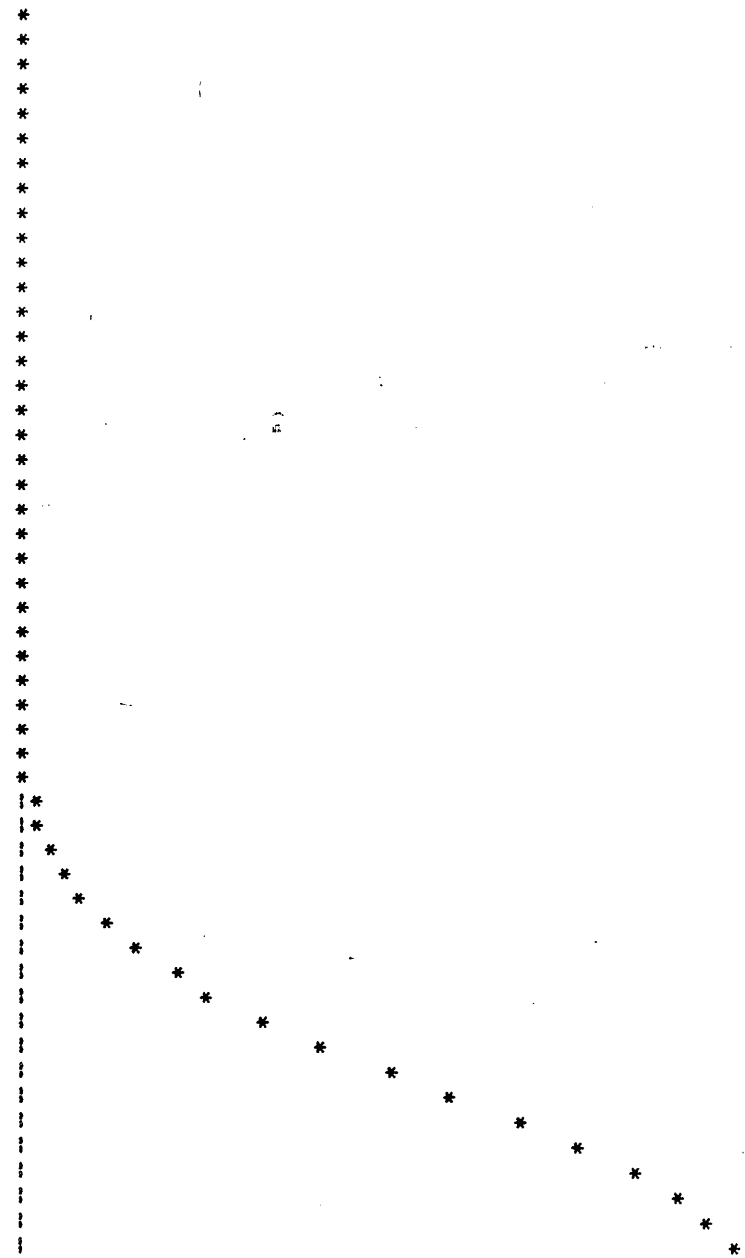


Data maximum (mV) : down hole channel - 14.727

FIRST ARRIVAL PLOT - Shot 17 Level 2367.0

Well phone data

Sample time	Value uV
854.0	-58.
854.5	-20.
855.0	25.
855.5	25.
856.0	25.
856.5	25.
857.0	25.
857.5	-4.
858.0	-8.
858.5	9.
859.0	25.
859.5	25.
860.0	25.
860.5	25.
861.0	25.
861.5	5.
862.0	-4.
862.5	1.
863.0	9.
863.5	19.
864.0	23.
864.5	17.
865.0	-2.
865.5	-18.
866.0	-39.
866.5	-52.
867.0	-49.
867.5	-30.
868.0	9.
868.5	25.
869.0	25.
869.5	25.
870.0	308.
870.5	420.
871.0	593.
871.5	855.
872.0	1166.
872.5	1676.
873.0	2309.
873.5	3112.
874.0	3942.
874.5	5052.
875.0	6293.
875.5	7624.
876.0	8974.
876.5	10295.
877.0	11516.
877.5	12626.
878.0	13567.
878.5	14277.
879.0	14727.



TRACE DISPLAY.

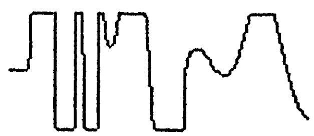
SHOT 18 Time 15:56:27 Level : 2243.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 541 400 467
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 3989mV

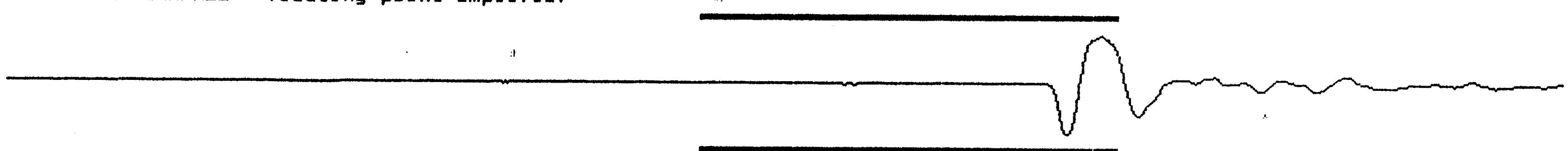
AUX. CHANNEL 2 Max. 9995mV

AUX. CHANNEL 3 Max. 5776mV

AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

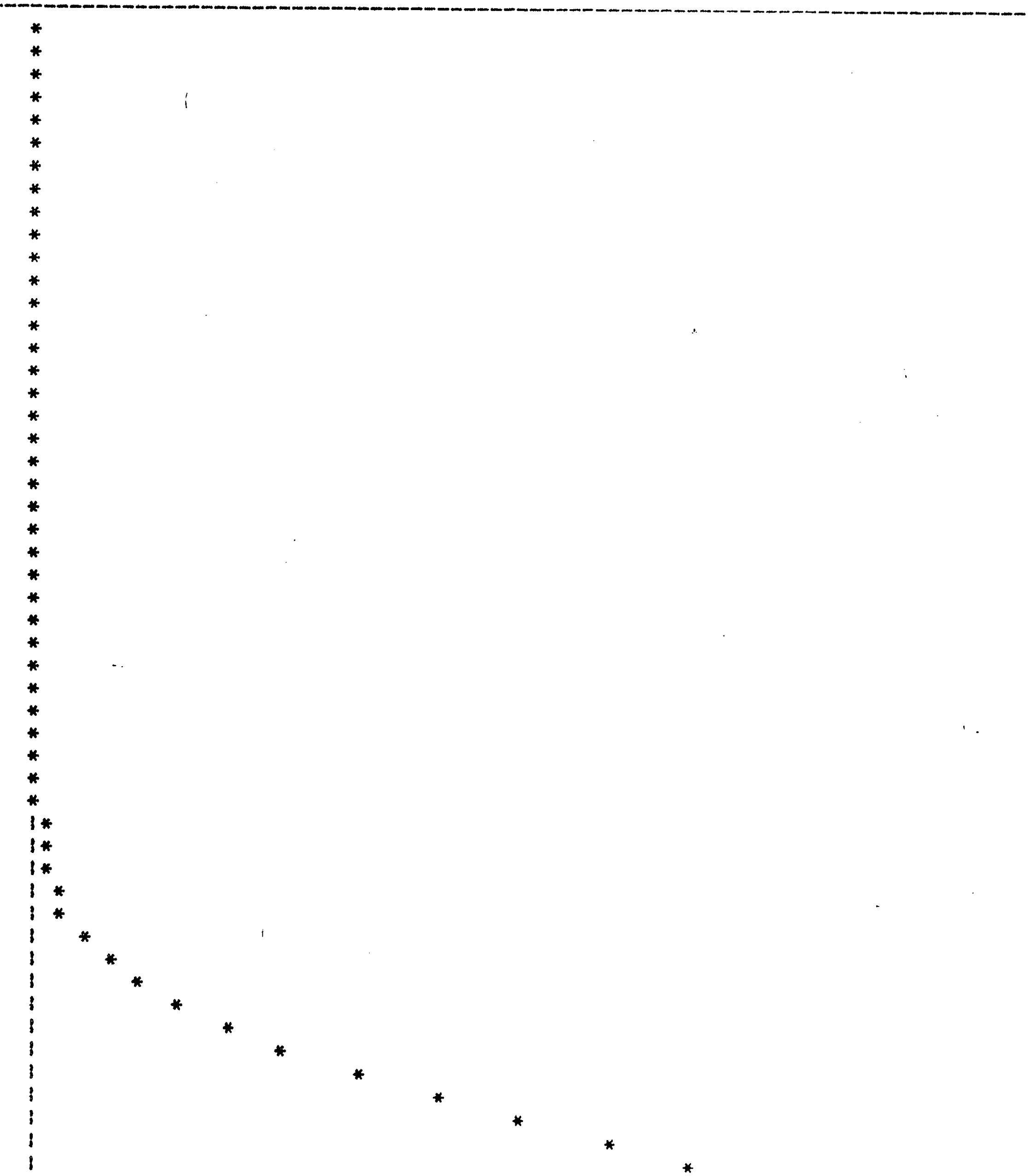


Data maximum (mV) : down hole channel - 18.289

FIRST ARRIVAL PLOT - Shot 18 Level 2243.0

Sample time	Value uV
818.0	40.
818.5	19.
819.0	6.
819.5	6.
820.0	15.
820.5	30.
821.0	41.
821.5	44.
822.0	39.
822.5	30.
823.0	19.
823.5	12.
824.0	12.
824.5	19.
825.0	31.
825.5	44.
826.0	49.
826.5	45.
827.0	32.
827.5	16.
828.0	8.
828.5	15.
829.0	31.
829.5	56.
830.0	73.
830.5	82.
831.0	81.
831.5	74.
832.0	68.
832.5	67.
833.0	71.
833.5	78.
834.0	86.
834.5	98.
835.0	117.
835.5	152.
836.0	212.
836.5	280.
837.0	424.
837.5	638.
838.0	950.
838.5	1551.
839.0	2191.
839.5	3044.
840.0	3942.
840.5	5173.
841.0	6613.
841.5	8194.
842.0	9895.
842.5	11636.
843.0	13337.

Well phone data

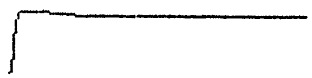


TRACE DISPLAY.

SHOT 20 Time 16:08:43 Level : 2147.0 Shot location : D
Shot depth : 2.0 Charge size : 3.0
No. surface samples : 128 Down hole sample nos : 515 400 493
Sample rates : 500 1000 usec Delay : 0

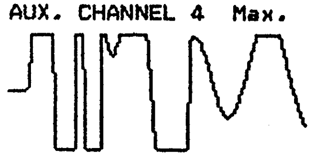
AUX. CHANNEL 1 Max. 4072mV

AUX. CHANNEL 2 Max. 9995mV

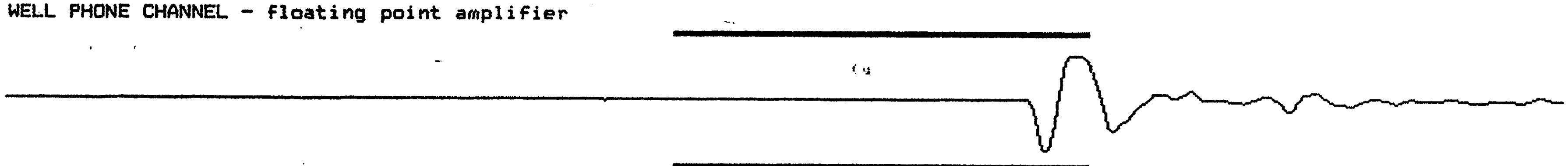


AUX. CHANNEL 3 Max. 6191mV

AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

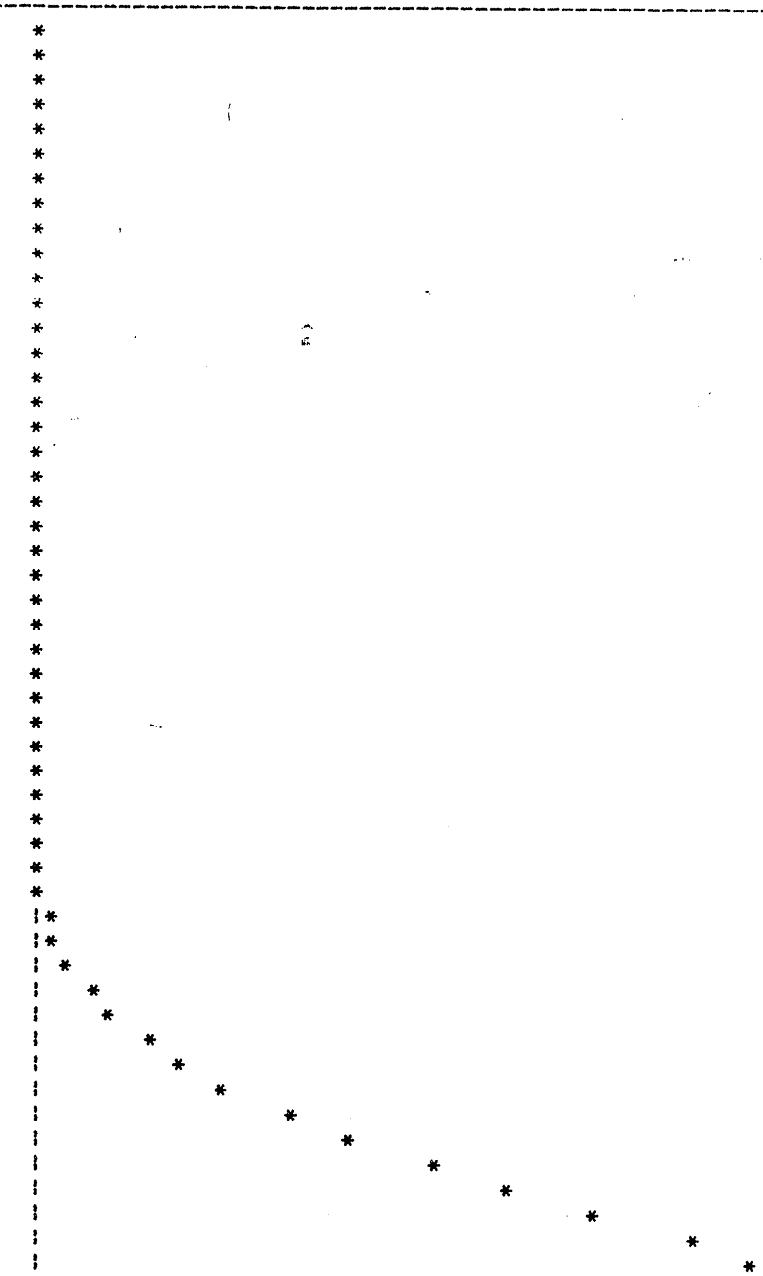


Data maximum (mV) : down hole channel - 20.090

FIRST ARRIVAL PLOT - Shot 20 Level 2147.0

Sample time	Value uV
796.0	5.
796.5	-3.
797.0	-9.
797.5	-11.
798.0	-8.
798.5	3.
799.0	11.
799.5	15.
800.0	9.
800.5	-5.
801.0	-19.
801.5	-31.
802.0	-36.
802.5	-33.
803.0	-24.
803.5	-13.
804.0	-6.
804.5	-3.
805.0	-6.
805.5	-12.
806.0	-21.
806.5	-31.
807.0	-39.
807.5	-42.
808.0	-38.
808.5	-29.
809.0	-16.
809.5	3.
810.0	13.
810.5	23.
811.0	32.
811.5	37.
812.0	39.
812.5	44.
813.0	101.
813.5	160.
814.0	246.
814.5	434.
815.0	737.
815.5	1268.
816.0	1886.
816.5	2724.
817.0	3742.
817.5	4882.
818.0	6383.
818.5	8124.
819.0	10015.
819.5	11986.
820.0	13957.
820.5	16568.
821.0	18089.

Well phone data

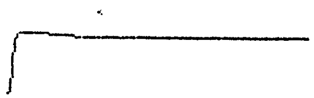


TRACE DISPLAY.

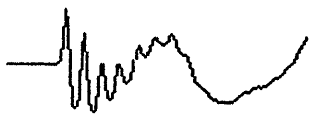
SHOT 21 Time 16:19:26 Level : 1985.0 Shot location : D
Shot depth : 2.0 Charge size : 2.0
No. surface samples : 128 Down hole sample nos : 468 400 540
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 3422mV

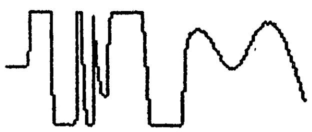
AUX. CHANNEL 2 Max. 9995mV



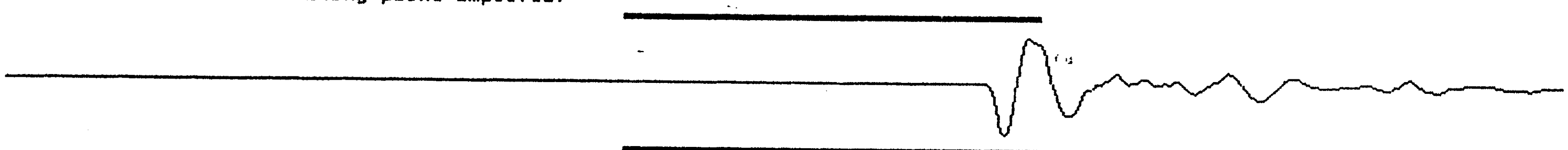
AUX. CHANNEL 3 Max. 4824mV



AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

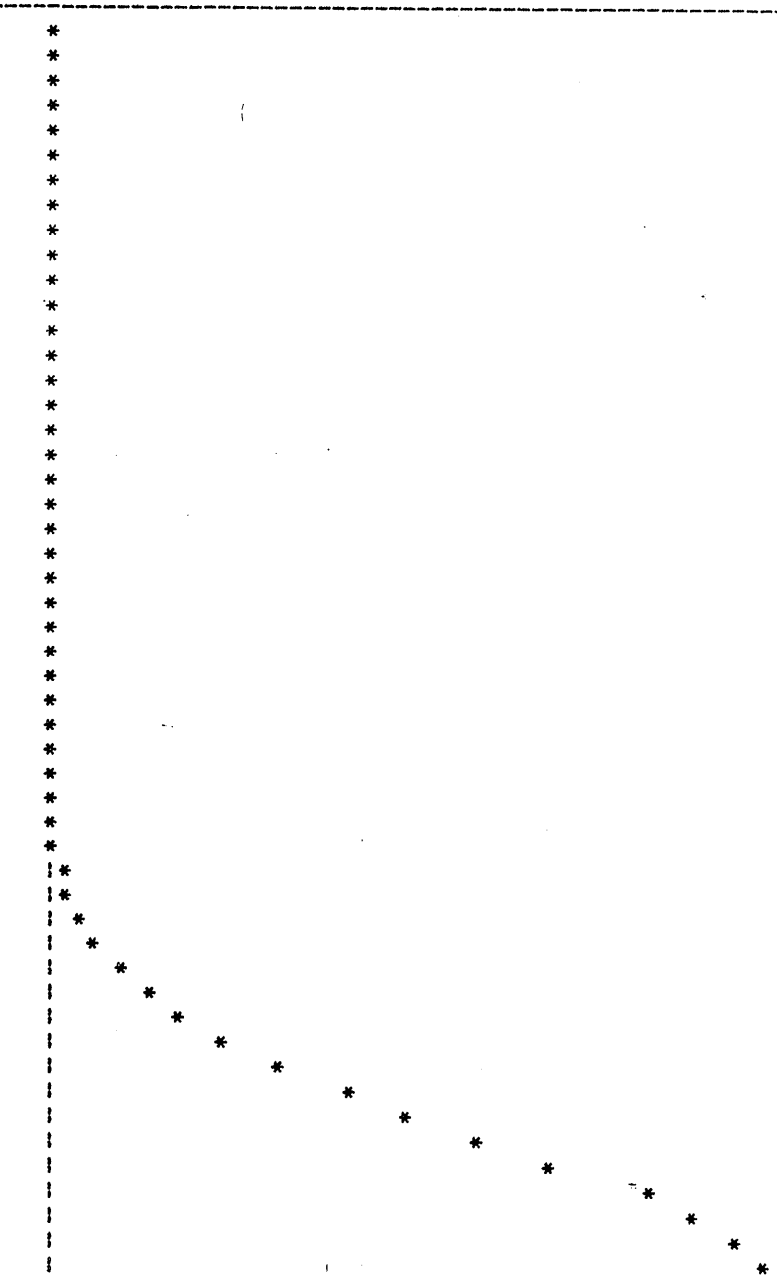


Data maximum (mV) : down hole channel - 19.810

FIRST ARRIVAL PLOT - Shot 21 Level 1985.0

Sample time	Value uV
754.0	11.
754.5	8.
755.0	-3.
755.5	-13.
756.0	-26.
756.5	-36.
757.0	-38.
757.5	-30.
758.0	-16.
758.5	3.
759.0	9.
759.5	9.
760.0	-0.
760.5	-9.
761.0	-19.
761.5	-28.
762.0	-33.
762.5	-32.
763.0	-25.
763.5	-13.
764.0	-3.
764.5	-0.
765.0	-6.
765.5	-17.
766.0	-34.
766.5	-50.
767.0	-57.
767.5	-56.
768.0	-48.
768.5	-35.
769.0	-20.
769.5	6.
770.0	35.
770.5	114.
771.0	268.
771.5	388.
772.0	670.
772.5	1226.
773.0	1838.
773.5	2679.
774.0	3722.
774.5	4872.
775.0	6403.
775.5	8114.
776.0	9995.
776.5	11956.
777.0	13907.
777.5	16448.
778.0	17889.
778.5	19009.
779.0	19730.

Well phone data



TRACE DISPLAY.

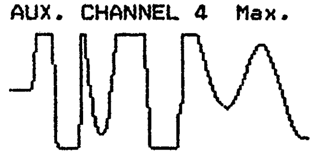
SHOT 22 Time 16:27:56 Level : 1808.0 Shot location : D
Shot depth : 2.0 Charge size : 1.0
No. surface samples : 128 Down hole sample nos : 416 400 592
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 1796mV

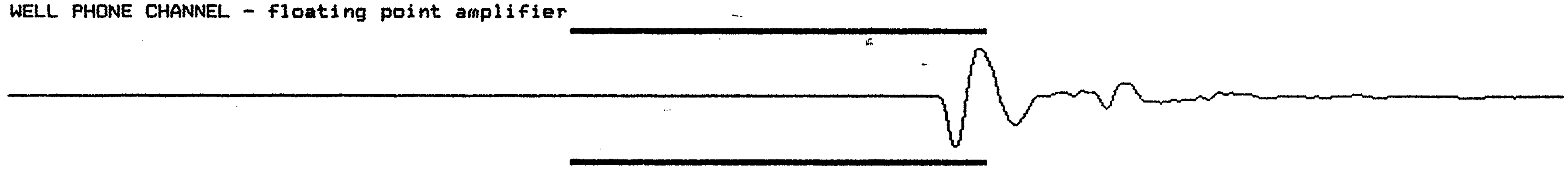
AUX. CHANNEL 2 Max. 9995mV

AUX. CHANNEL 3 Max. 2661mV

AUX. CHANNEL 4 Max. 10000mV



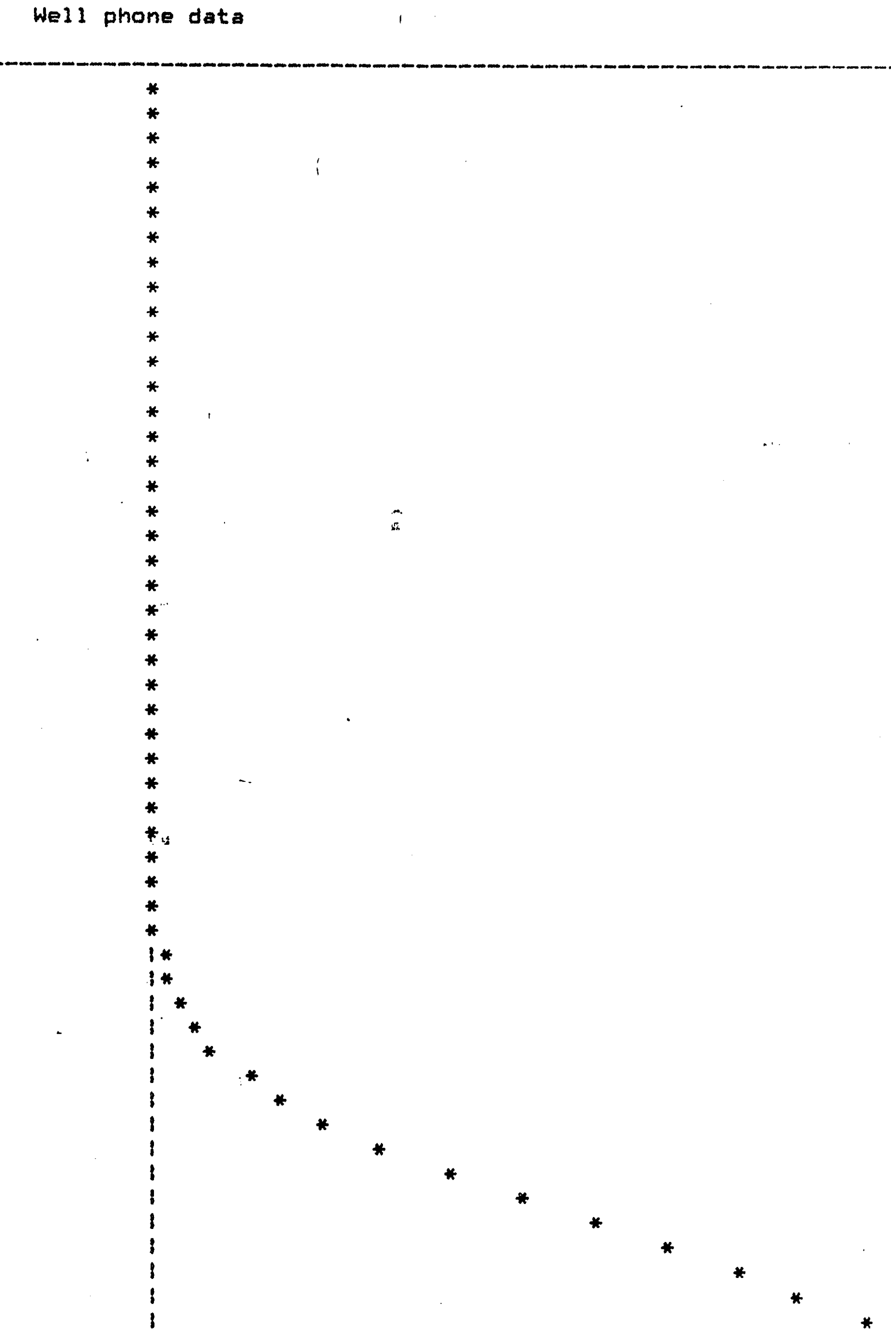
WELL PHONE CHANNEL - floating point amplifier



Data maximum (mV) : down hole channel - 16.528

FIRST ARRIVAL PLOT - Shot 22 Level 1808.0

Sample time	Value uV
704.0	-31.
704.5	-25.
705.0	-20.
705.5	-17.
706.0	-14.
706.5	-14.
707.0	-16.
707.5	-24.
708.0	-36.
708.5	-49.
709.0	-61.
709.5	-68.
710.0	-71.
710.5	-69.
711.0	-62.
711.5	-57.
712.0	-48.
712.5	-41.
713.0	-38.
713.5	-39.
714.0	-43.
714.5	-46.
715.0	-45.
715.5	-41.
716.0	-37.
716.5	-33.
717.0	-31.
717.5	-30.
718.0	-26.
718.5	-19.
719.0	-7.
719.5	8.
720.0	25.
720.5	54.
721.0	112.
721.5	203.
722.0	305.
722.5	518.
723.0	835.
723.5	1428.
724.0	2096.
724.5	2936.
725.0	3872.
725.5	5123.
726.0	6573.
726.5	8144.
727.0	9805.
727.5	11476.
728.0	13026.
728.5	14377.
729.0	15888.

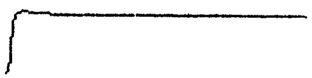


TRACE DISPLAY.

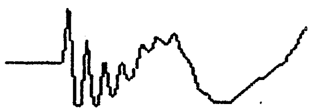
SHOT 23 Time 16:35:15 Level : 1723.0 Shot location : D
Shot depth : 2.0 Charge size : 1.0
No. surface samples : 128 Down hole sample nos : 394 400 614
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 1919mV

AUX. CHANNEL 2 Max. 9995mV

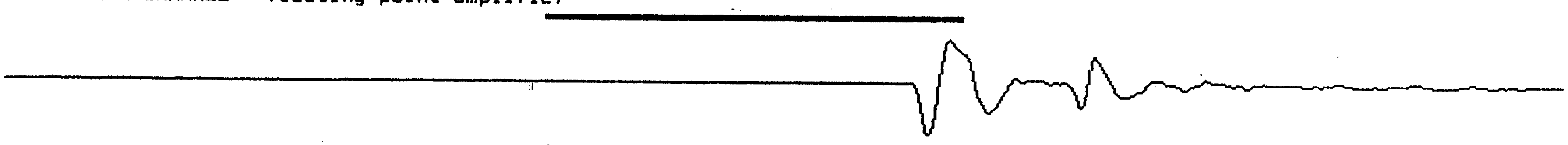


AUX. CHANNEL 3 Max. 2734mV



AUX. CHANNEL 4 Max. 10000mV

WELL PHONE CHANNEL - floating point amplifier

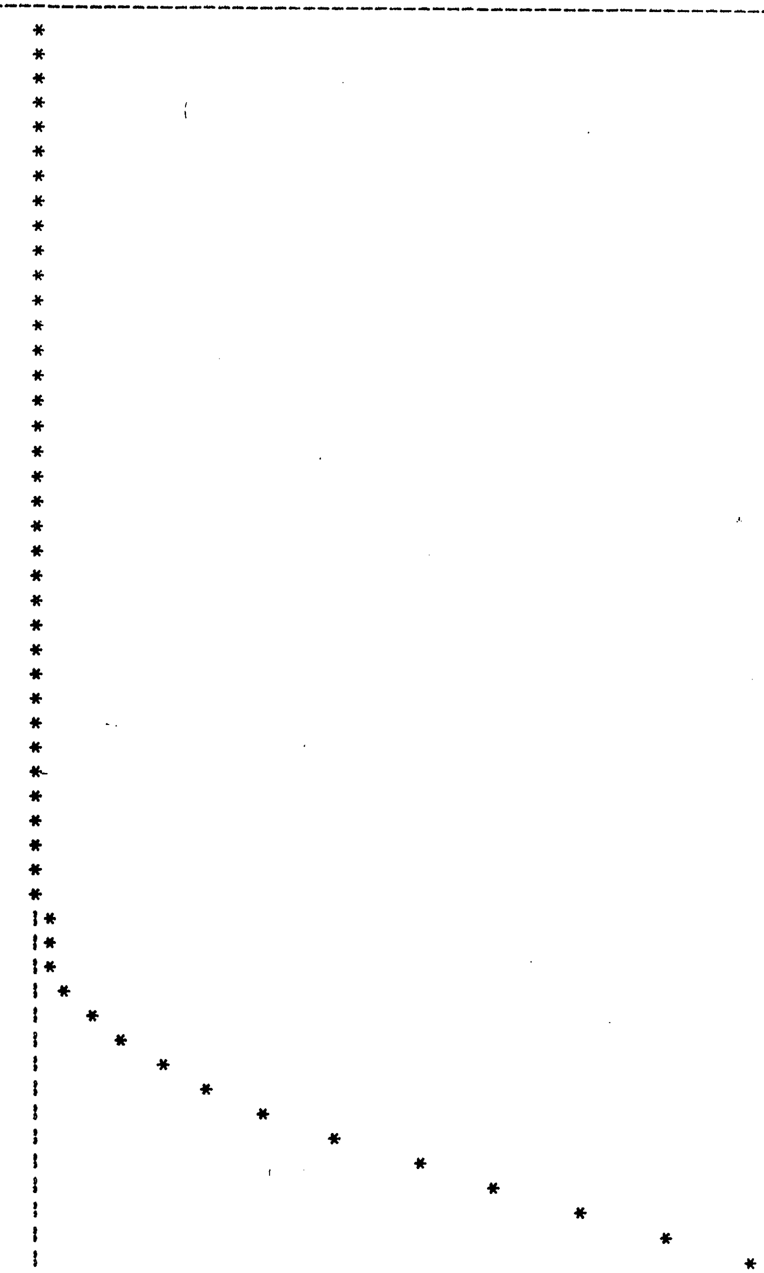


Data maximum (mV) : down hole channel - 18.609

FIRST ARRIVAL PLOT – Shot 23 Level 1723.0

Sample time	Value uV
680.0	-9.
680.5	-5.
681.0	2.
681.5	5.
682.0	9.
682.5	8.
683.0	5.
683.5	1.
684.0	-0.
684.5	1.
685.0	3.
685.5	6.
686.0	7.
686.5	5.
687.0	1.
687.5	-2.
688.0	-3.
688.5	-1.
689.0	3.
689.5	6.
690.0	7.
690.5	4.
691.0	-4.
691.5	-10.
692.0	-17.
692.5	-20.
693.0	-19.
693.5	-13.
694.0	-7.
694.5	1.
695.0	6.
695.5	13.
696.0	20.
696.5	34.
697.0	57.
697.5	106.
698.0	186.
698.5	281.
699.0	473.
699.5	776.
700.0	1378.
700.5	2089.
701.0	3041.
701.5	4062.
702.0	5513.
702.5	7204.
703.0	9084.
703.5	11075.
704.0	13096.
704.5	14957.
705.0	17128.

Well phone data



TRACE DISPLAY.

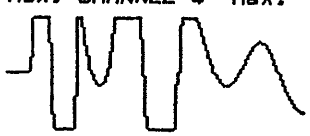
SHOT 24 Time 16:43:33 Level : 1600.0 Shot location : D
Shot depth : 2.0 Charge size : 1.0
No. surface samples : 128 Down hole sample nos : 362 400 646
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 1879mV

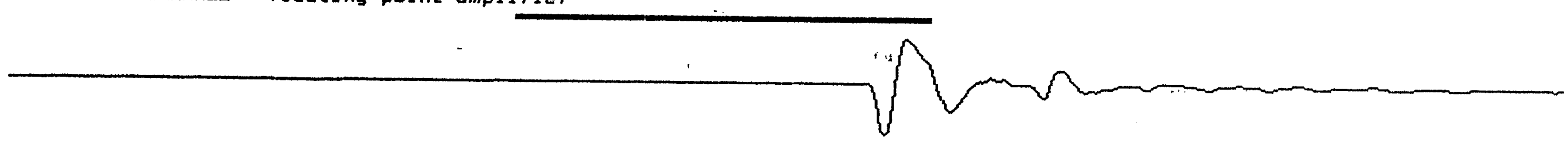
AUX. CHANNEL 2 Max. 9995mV

AUX. CHANNEL 3 Max. 2856mV

AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

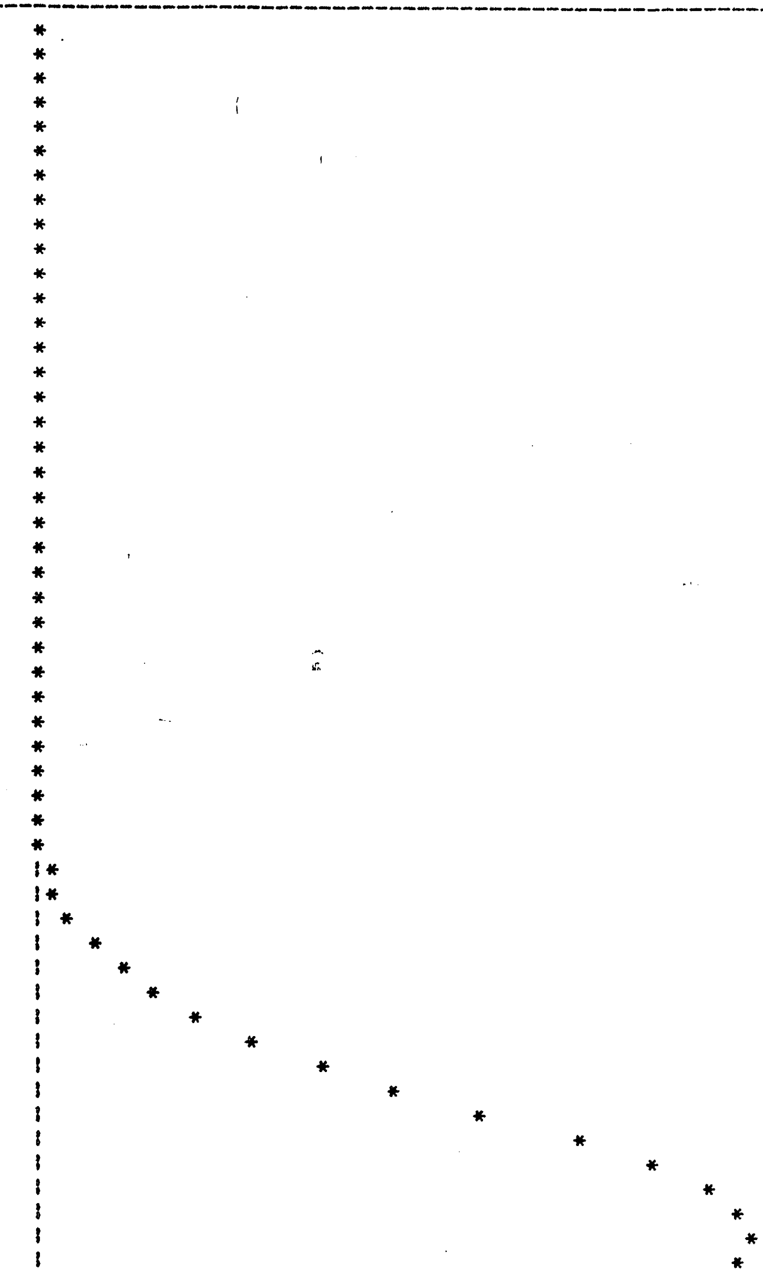


Data maximum (mV) : down hole channel - 23.972

FIRST ARRIVAL PLOT - Shot 24 Level 1600.0

Sample time	Value uV
644.0	-1.
644.5	2.
645.0	7.
645.5	15.
646.0	26.
646.5	36.
647.0	40.
647.5	39.
648.0	34.
648.5	25.
649.0	16.
649.5	8.
650.0	4.
650.5	1.
651.0	0.
651.5	-0.
652.0	-2.
652.5	-3.
653.0	-4.
653.5	-3.
654.0	-2.
654.5	-1.
655.0	-2.
655.5	-4.
656.0	-6.
656.5	-9.
657.0	-10.
657.5	-9.
658.0	-6.
658.5	2.
659.0	48.
659.5	39.
660.0	100.
660.5	202.
661.0	326.
661.5	582.
662.0	1123.
662.5	1798.
663.0	2729.
663.5	3842.
664.0	5463.
664.5	7394.
665.0	9665.
665.5	12186.
666.0	14807.
666.5	18409.
667.0	20610.
667.5	22491.
668.0	23532.
668.5	23972.
669.0	23652.

Well phone data

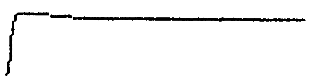


TRACE DISPLAY.

SHOT 25 Time 16:52:15 Level : 1475.0 Shot location : D
Shot depth : 2.0 Charge size : 1.0
No. surface samples : 128 Down hole sample nos : 327 400 681
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 1962mV

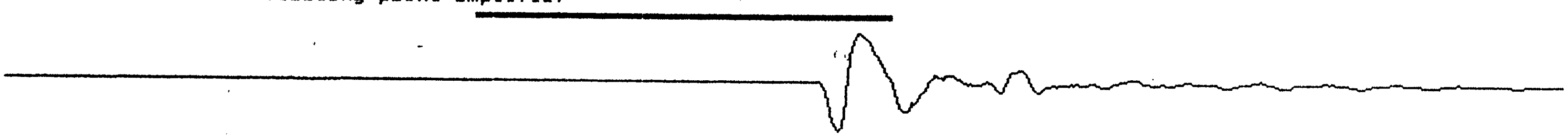
AUX. CHANNEL 2 Max. 9995mV



AUX. CHANNEL 3 Max. 2793mV

AUX. CHANNEL 4 Max. 10000mV

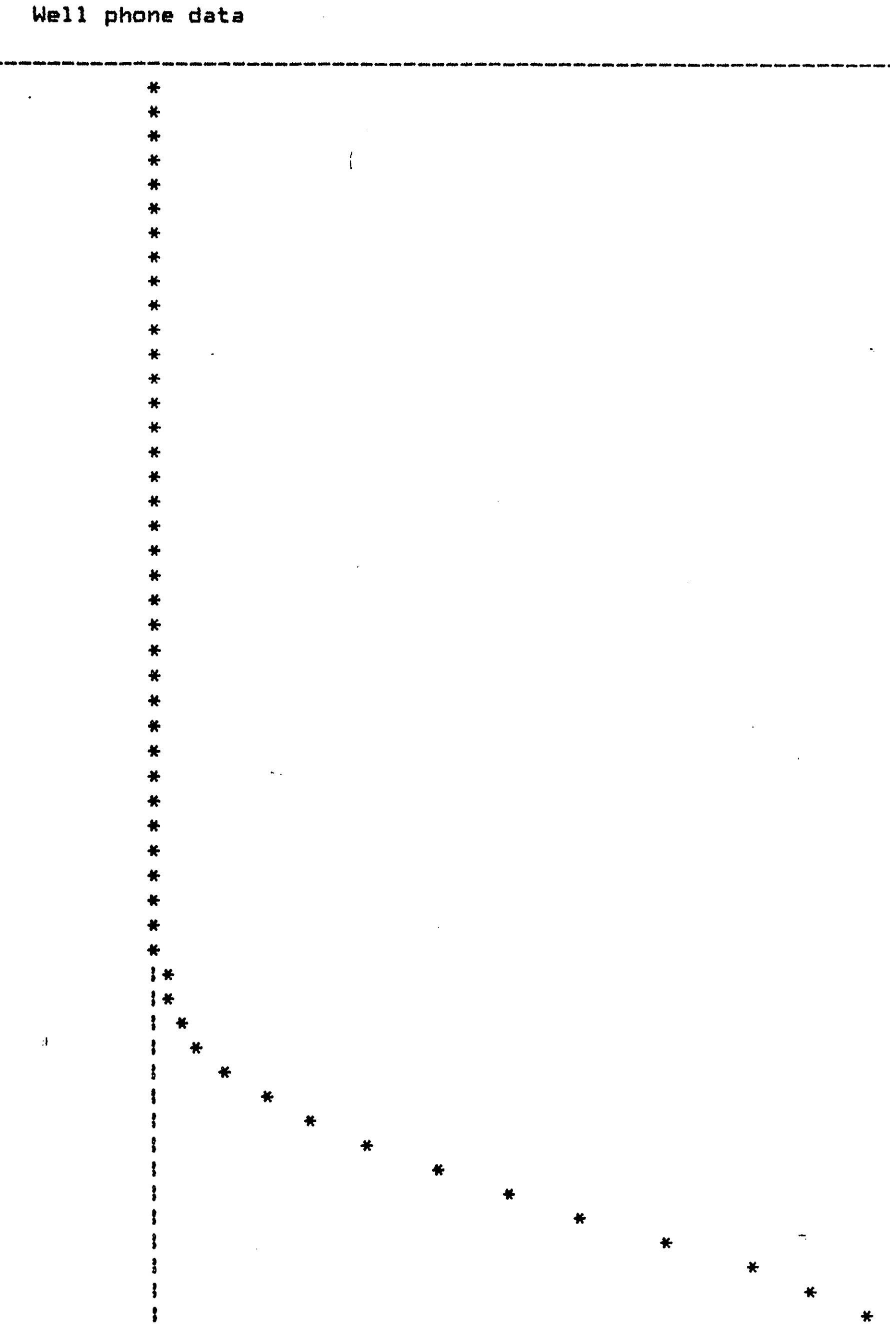
WELL PHONE CHANNEL - floating point amplifier



Data maximum (mV) : down hole channel - 26.173

FIRST ARRIVAL PLOT - Shot 25 Level 1475.0

Sample time	Value uV
602.0	-8.
602.5	-4.
603.0	-5.
603.5	-9.
604.0	-13.
604.5	-17.
605.0	-21.
605.5	-25.
606.0	-28.
606.5	-30.
607.0	-27.
607.5	-18.
608.0	1.
608.5	10.
609.0	20.
609.5	25.
610.0	22.
610.5	16.
611.0	8.
611.5	1.
612.0	-2.
612.5	-5.
613.0	-9.
613.5	-14.
614.0	-18.
614.5	-19.
615.0	-18.
615.5	-13.
616.0	-10.
616.5	-8.
617.0	-11.
617.5	-16.
618.0	-21.
618.5	-13.
619.0	27.
619.5	101.
620.0	278.
620.5	422.
621.0	771.
621.5	1498.
622.0	2329.
622.5	3482.
623.0	4742.
623.5	6493.
624.0	8524.
624.5	10745.
625.0	13046.
625.5	15277.
626.0	18129.
626.5	19890.
627.0	21450.

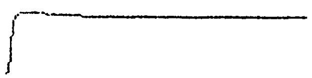


TRACE DISPLAY.

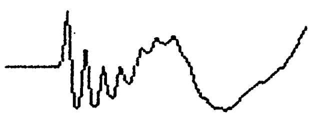
SHOT 26 Time 16:58:37 Level : 1324.0 Shot location : D
Shot depth : 2.0 Charge size : 1.0
No. surface samples : 128 Down hole sample nos : 283 400 725
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 1865mV

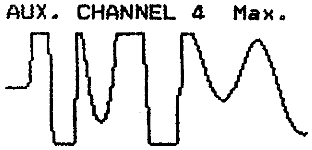
AUX. CHANNEL 2 Max. 9995mV



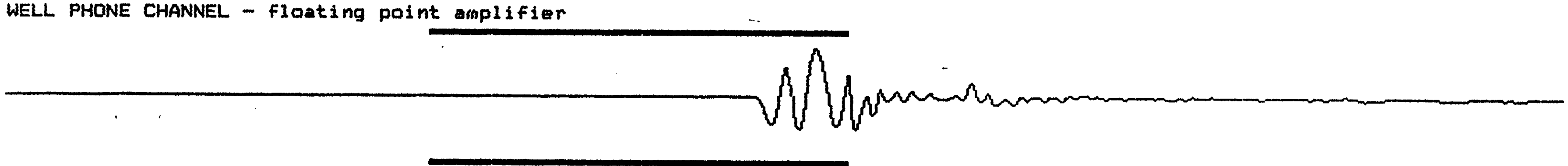
AUX. CHANNEL 3 Max. 2749mV



AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

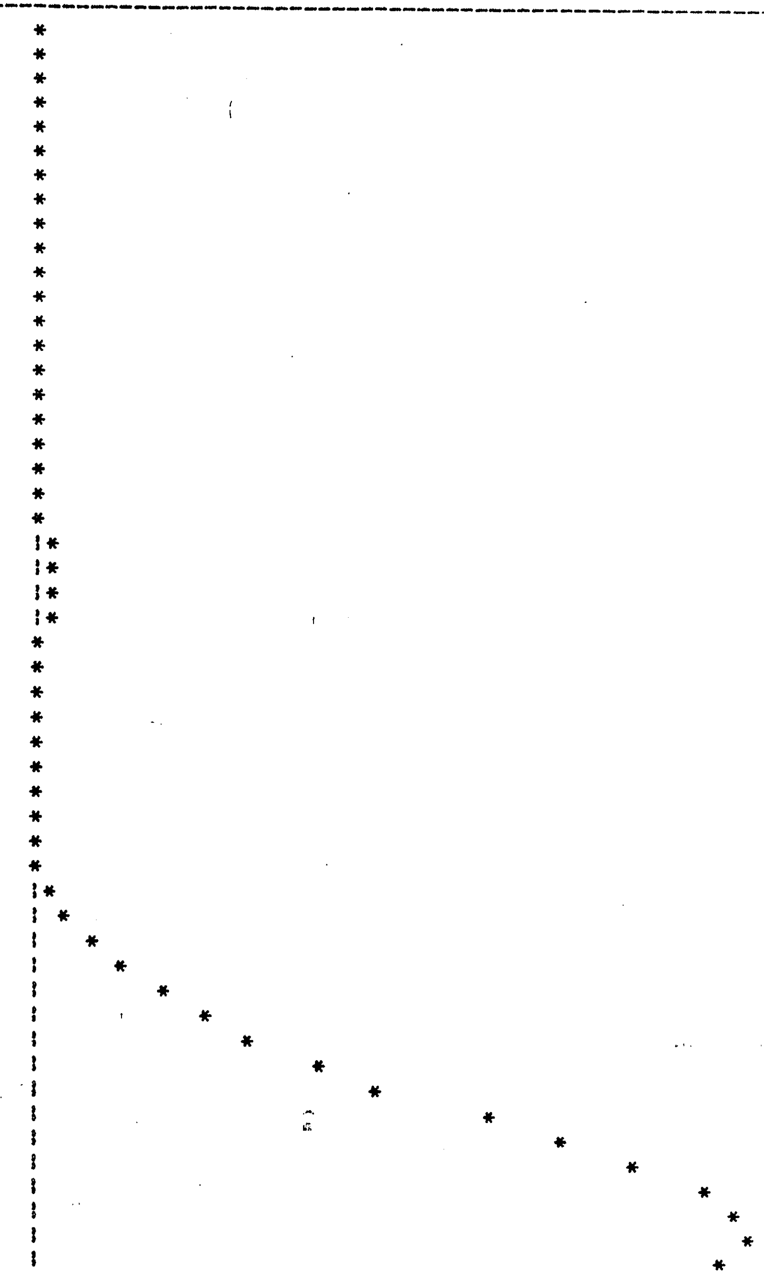


Data maximum (mV) : down hole channel - 52.746

FIRST ARRIVAL PLOT - Shot 26 Level 1324.0

Sample time	Value uV
550.0	114.
550.5	107.
551.0	91.
551.5	61.
552.0	23.
552.5	-45.
553.0	-147.
553.5	-257.
554.0	-305.
554.5	-360.
555.0	-371.
555.5	-330.
556.0	-251.
556.5	-132.
557.0	-45.
557.5	3.
558.0	25.
558.5	49.
559.0	96.
559.5	172.
560.0	248.
560.5	350.
561.0	420.
561.5	423.
562.0	350.
562.5	166.
563.0	-75.
563.5	-223.
564.0	-353.
564.5	-512.
565.0	-632.
565.5	-689.
566.0	-652.
566.5	-476.
567.0	58.
567.5	405.
568.0	1413.
568.5	2386.
569.0	3587.
569.5	4902.
570.0	6653.
570.5	8694.
571.0	11125.
571.5	13867.
572.0	18169.
572.5	21170.
573.0	24092.
573.5	26493.
574.0	27974.
574.5	28454.
575.0	27493.

Well phone data

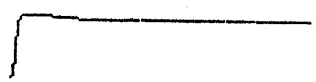


TRACE DISPLAY.

SHOT 27 Time 17:04:10 Level : 1174.0 Shot location : D
Shot depth : 2.0 Charge size : 1.0
No. surface samples : 128 Down hole sample nos : 237 400 771
Sample rates : 500 1000 usec Delay : 0

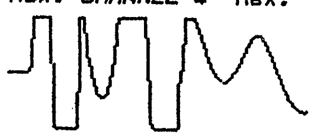
AUX. CHANNEL 1 Max. 1865mV

AUX. CHANNEL 2 Max. 9995mV

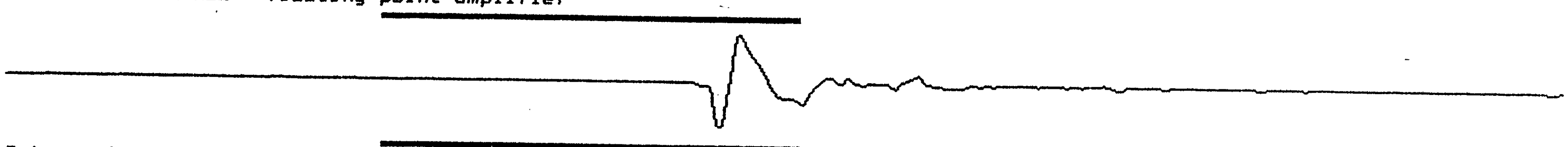


AUX. CHANNEL 3 Max. 2778mV

AUX. CHANNEL 4 Max. 10000mV



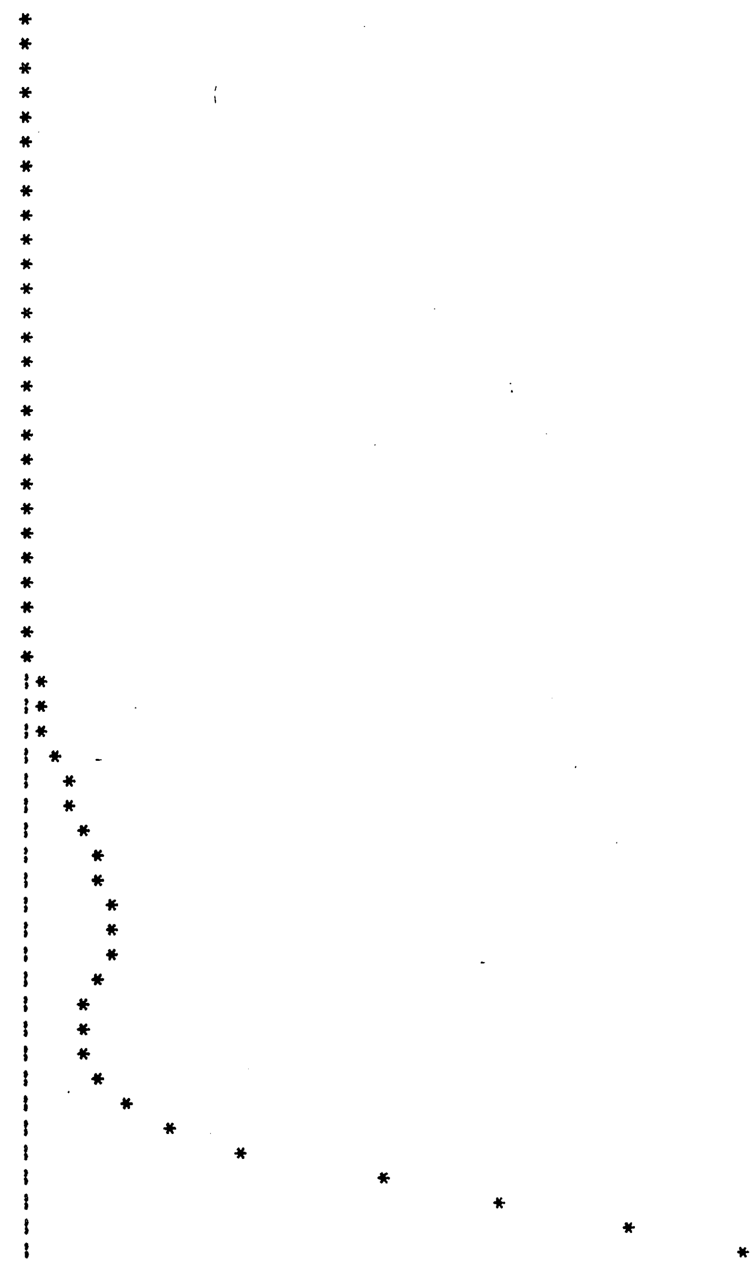
WELL PHONE CHANNEL - floating point amplifier



Data maximum (mV) : down hole channel - 57.908

FIRST ARRIVAL PLOT - Shot 27 Level 1174.0

Well phone data



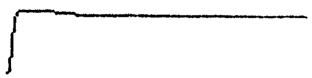
Sample time	Value uV
500.0	31.
500.5	49.
501.0	57.
501.5	50.
502.0	28.
502.5	-7.
503.0	-36.
503.5	-58.
504.0	-58.
504.5	-53.
505.0	-28.
505.5	6.
506.0	28.
506.5	42.
507.0	41.
507.5	28.
508.0	4.
508.5	-21.
509.0	-52.
509.5	-83.
510.0	-103.
510.5	-102.
511.0	-68.
511.5	-15.
512.0	108.
512.5	235.
513.0	347.
513.5	519.
514.0	738.
514.5	1146.
515.0	1601.
515.5	2186.
516.0	2864.
516.5	3589.
517.0	4182.
517.5	4702.
518.0	4982.
518.5	4992.
519.0	4722.
519.5	4232.
520.0	3654.
520.5	3277.
521.0	3342.
521.5	4012.
522.0	5723.
522.5	8694.
523.0	13076.
523.5	21370.
524.0	28574.
524.5	35818.
525.0	42781.

TRACE DISPLAY.

SHOT 28 Time 17:10:50 Level : 1010.0 Shot location : D
Shot depth : 2.0 Charge size : 0.5
No. surface samples : 128 Down hole sample nos : 183 400 825
Sample rates : 500 1000 usec Delay : 0

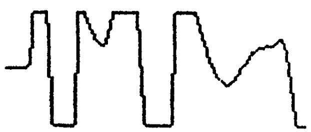
AUX. CHANNEL 1 Max. 1240mV

AUX. CHANNEL 2 Max. 9995mV

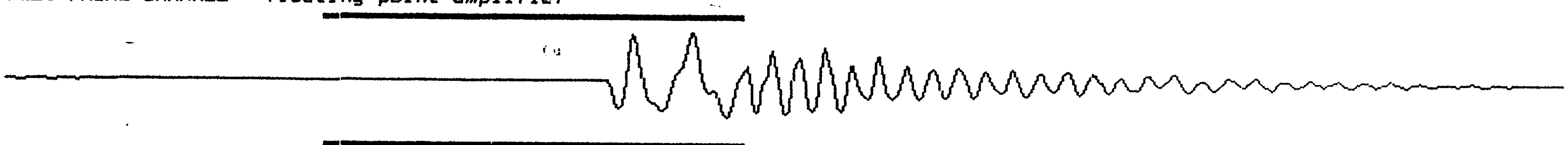


AUX. CHANNEL 3 Max. 2124mV

AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

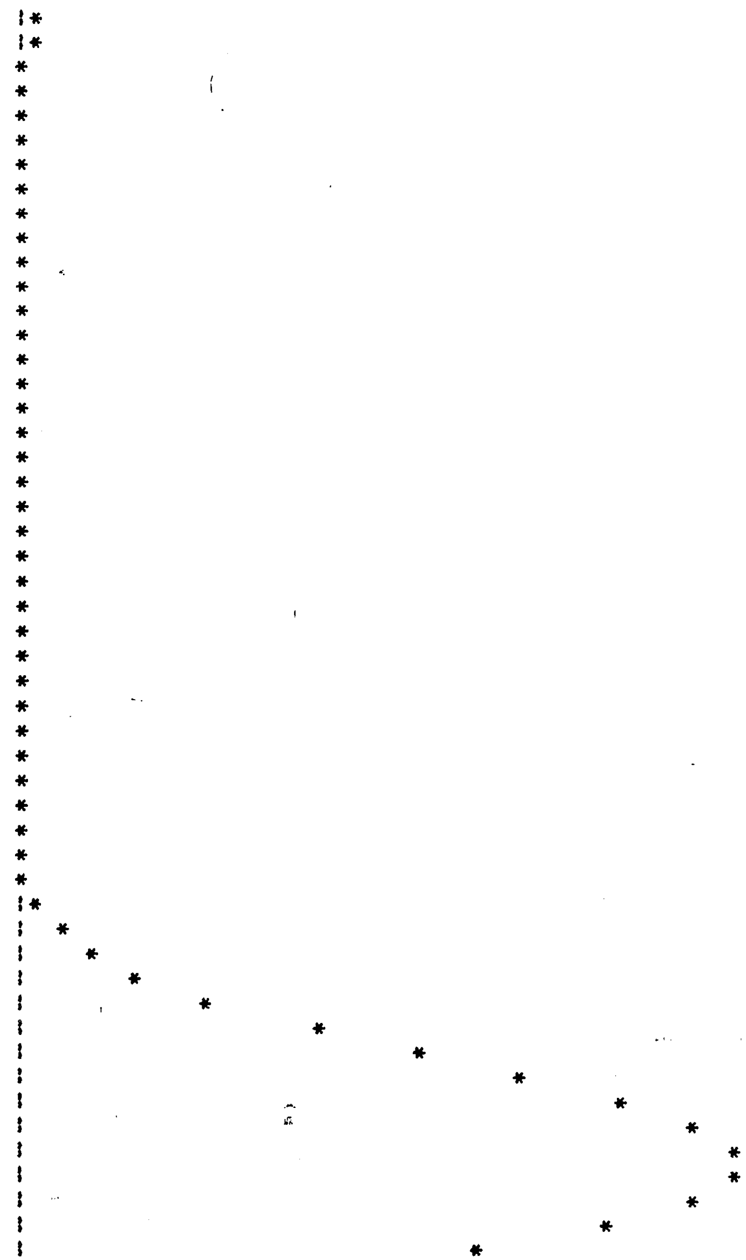


Data maximum (mV) : down hole channel - 72.355

FIRST ARRIVAL PLOT - Shot 28 Level 1010.0

Sample time	Value uV
428.0	615.
428.5	488.
429.0	371.
429.5	265.
430.0	139.
430.5	49.
431.0	-118.
431.5	-302.
432.0	-397.
432.5	-543.
433.0	-653.
433.5	-715.
434.0	-734.
434.5	-719.
435.0	-687.
435.5	-646.
436.0	-607.
436.5	-578.
437.0	-565.
437.5	-571.
438.0	-597.
438.5	-637.
439.0	-687.
439.5	-747.
440.0	-817.
440.5	-890.
441.0	-959.
441.5	-990.
442.0	-1010.
442.5	-1023.
443.0	-995.
443.5	-943.
444.0	-936.
444.5	-801.
445.0	-558.
445.5	259.
446.0	620.
446.5	2291.
447.0	4112.
447.5	6993.
448.0	10865.
448.5	17849.
449.0	23772.
449.5	29574.
450.0	35017.
450.5	39499.
451.0	41580.
451.5	41820.
452.0	39459.
452.5	34617.
453.0	27173.

Well phone data

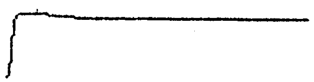


TRACE DISPLAY.

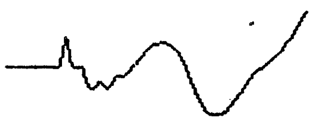
SHOT 29 Time 17:18:04 Level : 1204.1 Shot location : D
Shot depth : 2.0 Charge size : 0.5
No. surface samples : 128 Down hole sample nos : 247 400 761
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 771mV

AUX. CHANNEL 2 Max. 9995mV

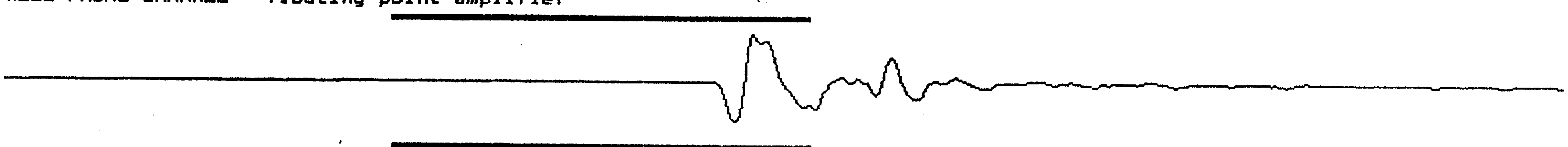


AUX. CHANNEL 3 Max. 1806mV



AUX. CHANNEL 4 Max. 10000mV

WELL PHONE CHANNEL - floating point amplifier

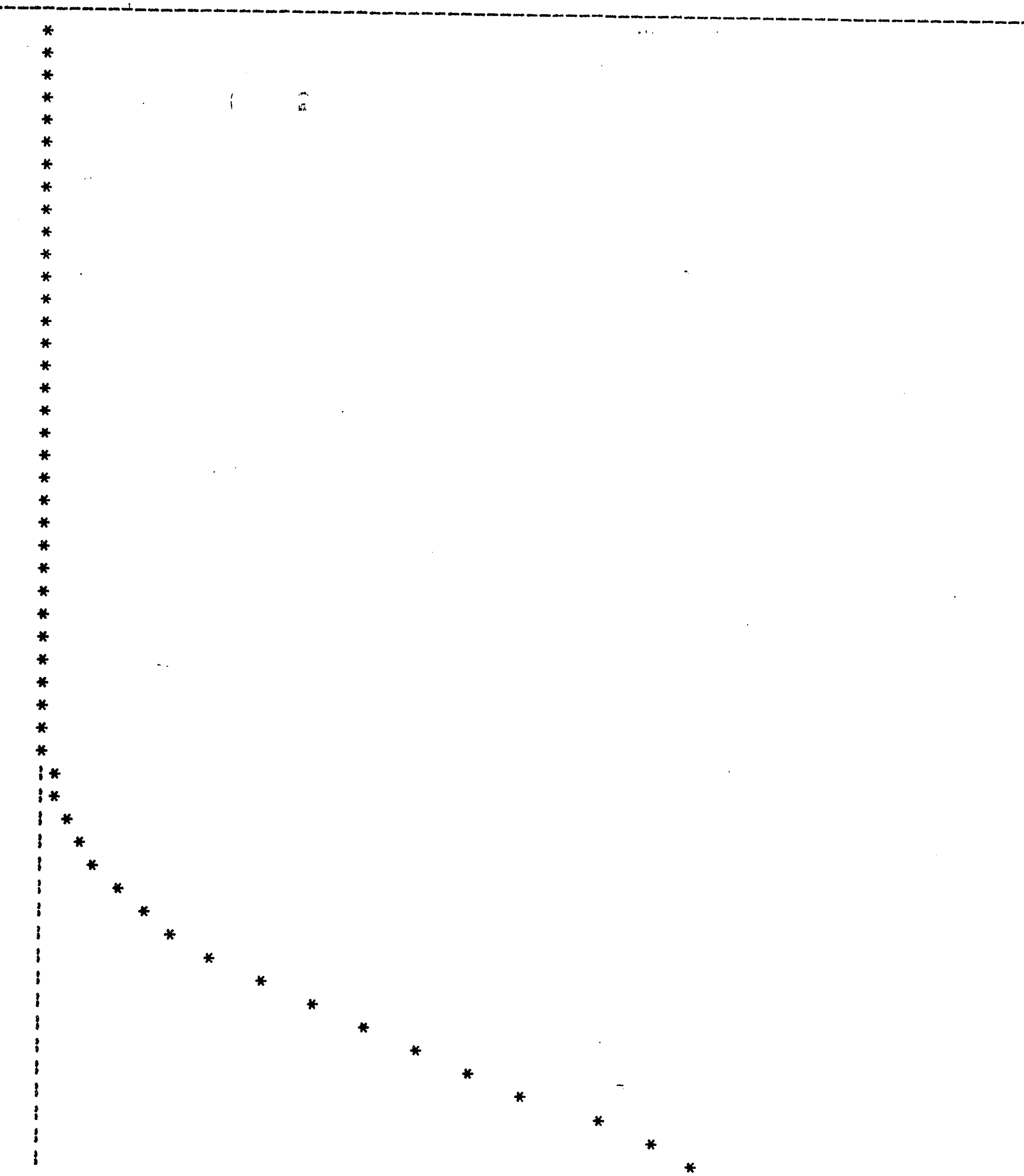


Data maximum (mV) : down hole channel - 26.133

FIRST ARRIVAL PLOT - Shot 29 Level 1204.1

Sample time	Value uV
512.0	-29.
512.5	-31.
513.0	-28.
513.5	-23.
514.0	-19.
514.5	-17.
515.0	-18.
515.5	-17.
516.0	-12.
516.5	0.
517.0	8.
517.5	16.
518.0	21.
518.5	23.
519.0	23.
519.5	23.
520.0	23.
520.5	21.
521.0	20.
521.5	19.
522.0	21.
522.5	23.
523.0	23.
523.5	17.
524.0	4.
524.5	-11.
525.0	-23.
525.5	-31.
526.0	-29.
526.5	-15.
527.0	16.
527.5	79.
528.0	170.
528.5	267.
529.0	443.
529.5	688.
530.0	1146.
530.5	1628.
531.0	2276.
531.5	3069.
532.0	3932.
532.5	5082.
533.0	6383.
533.5	7844.
534.0	9395.
534.5	11005.
535.0	12626.
535.5	14217.
536.0	16408.
536.5	17769.
537.0	18969.

Well phone data

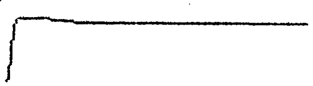


TRACE DISPLAY.

SHOT 30 Time 17:24:59 Level : 951.0 Shot location : D
Shot depth : 2.0 Charge size : 1.0
No. surface samples : 128 Down hole sample nos : 164 400 844
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 1225mV

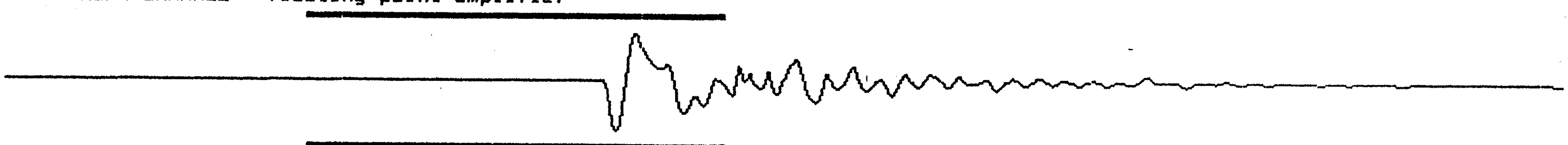
AUX. CHANNEL 2 Max. 9995mV



AUX. CHANNEL 3 Max. 2094mV

AUX. CHANNEL 4 Max. 10000mV

WELL PHONE CHANNEL - floating point amplifier

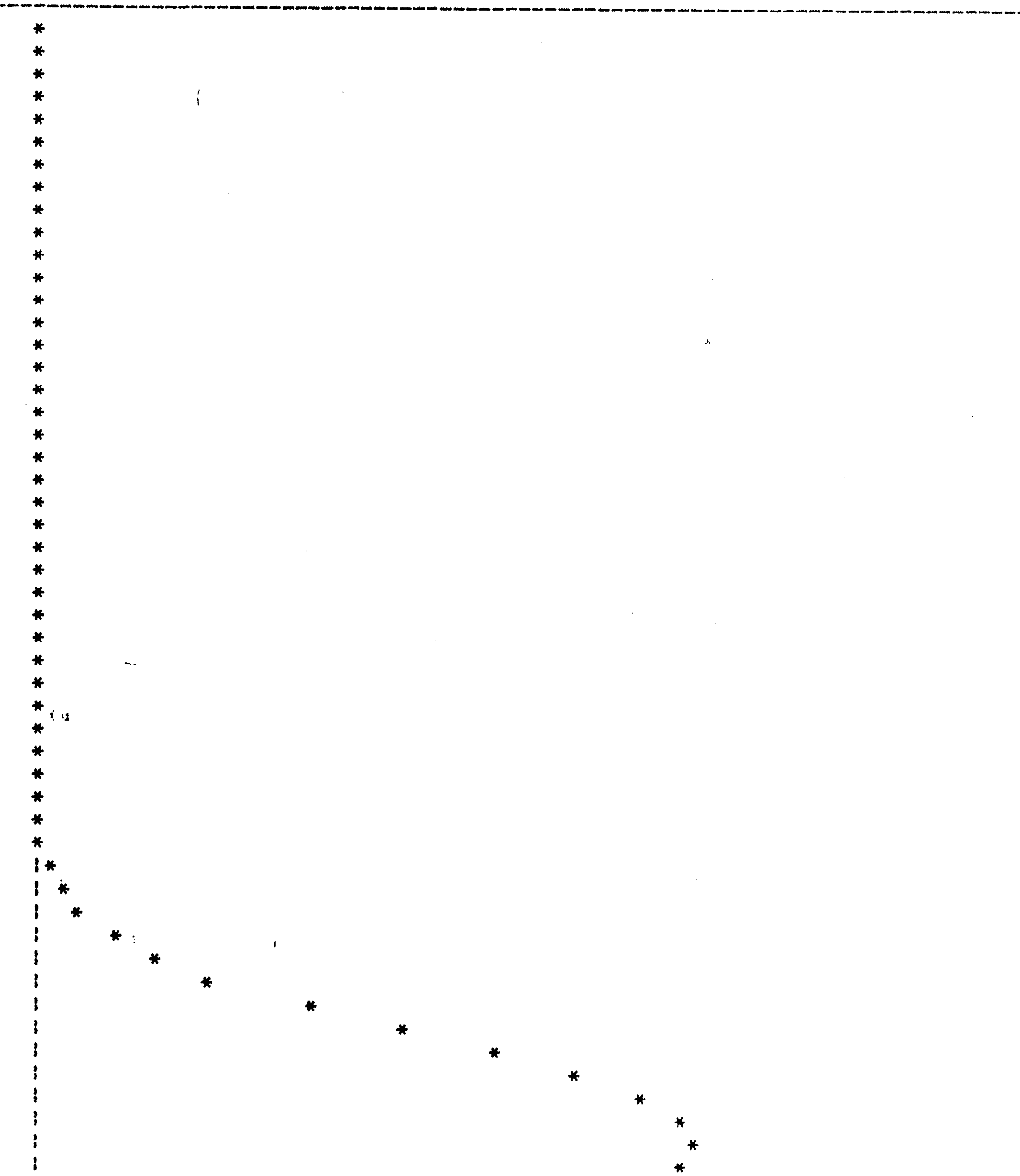


Data maximum (mV) : down hole channel - 50.505

FIRST ARRIVAL PLOT — Shot 30 Level 951.0

Sample time	Value uV
416.0	45.
416.5	56.
417.0	67.
417.5	73.
418.0	74.
418.5	71.
419.0	65.
419.5	59.
420.0	52.
420.5	46.
421.0	46.
421.5	51.
422.0	62.
422.5	73.
423.0	80.
423.5	82.
424.0	78.
424.5	72.
425.0	63.
425.5	55.
426.0	47.
426.5	40.
427.0	35.
427.5	34.
428.0	37.
428.5	40.
429.0	45.
429.5	48.
430.0	49.
430.5	48.
431.0	47.
431.5	47.
432.0	48.
432.5	58.
433.0	101.
433.5	208.
434.0	369.
434.5	799.
435.0	1906.
435.5	3509.
436.0	5603.
436.5	9004.
437.0	13567.
437.5	21611.
438.0	28334.
438.5	35137.
439.0	41380.
439.5	46263.
440.0	49384.
440.5	50505.
441.0	49464.

Well phone data



TRACE DISPLAY.

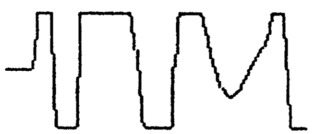
SHOT 31 Time 17:32:27 Level : 751.0 Shot location : D
Shot depth : 2.0 Charge size : 0.5
No. surface samples : 128 Down hole sample nos : 90 400 918
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 1118mV

AUX. CHANNEL 2 Max. 9995mV

AUX. CHANNEL 3 Max: 2016mV

AUX. CHANNEL 4 Max. 10000mV

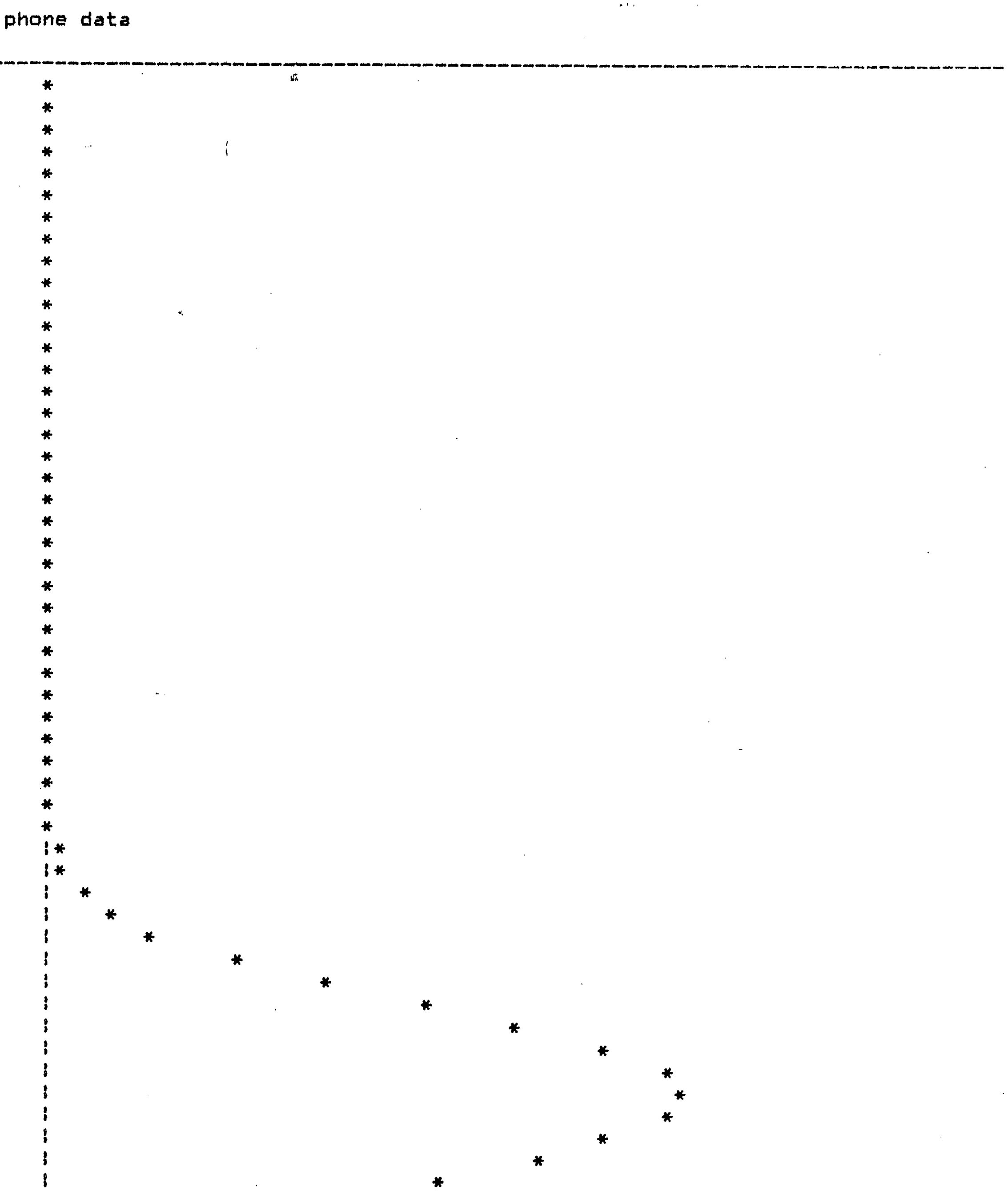


WELL PHONE CHANNEL - floating point amplifier

Data maximum (mV) : down hole channel - 74.356

FIRST ARRIVAL PLOT - Shot 31 Level 751.0

Sample time	Value uV
340.0	-31.
340.5	-17.
341.0	1.
341.5	9.
342.0	16.
342.5	20.
343.0	21.
343.5	18.
344.0	12.
344.5	-1.
345.0	-13.
345.5	-28.
346.0	-46.
346.5	-60.
347.0	-67.
347.5	-65.
348.0	-59.
348.5	-55.
349.0	-47.
349.5	-40.
350.0	-32.
350.5	-25.
351.0	-15.
351.5	-0.
352.0	6.
352.5	10.
353.0	7.
353.5	-3.
354.0	-11.
354.5	-16.
355.0	-15.
355.5	3.
356.0	31.
356.5	141.
357.0	309.
357.5	795.
358.0	2186.
358.5	4062.
359.0	7414.
359.5	12846.
360.0	23652.
360.5	33736.
361.0	45262.
361.5	56788.
362.0	67713.
362.5	74276.
363.0	76517.
363.5	74356.
364.0	68033.
364.5	59829.
365.0	47943.

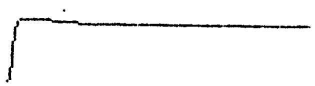


TRACE DISPLAY.

SHOT 32 Time 17:37:43 Level : 716.0 Shot location : D
Shot depth : 2.0 Charge size : 0.5
No. surface samples : 128 Down hole sample nos : 77 400 931
Sample rates : 500 1000 usec Delay : 0

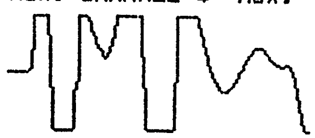
AUX. CHANNEL 1 Max. 1313mV

AUX. CHANNEL 2 Max. 9995mV

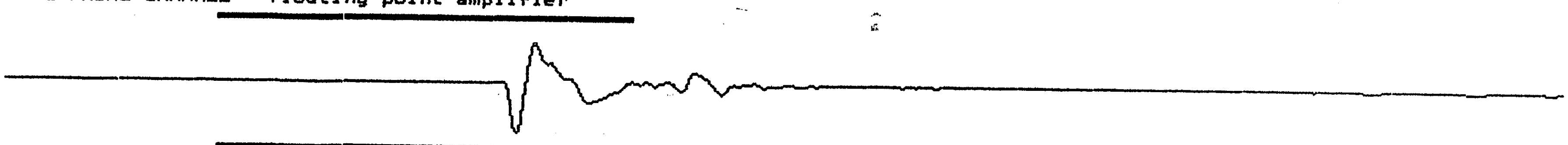


AUX. CHANNEL 3 Max. 2104mV

AUX. CHANNEL 4 Max. 10000mV

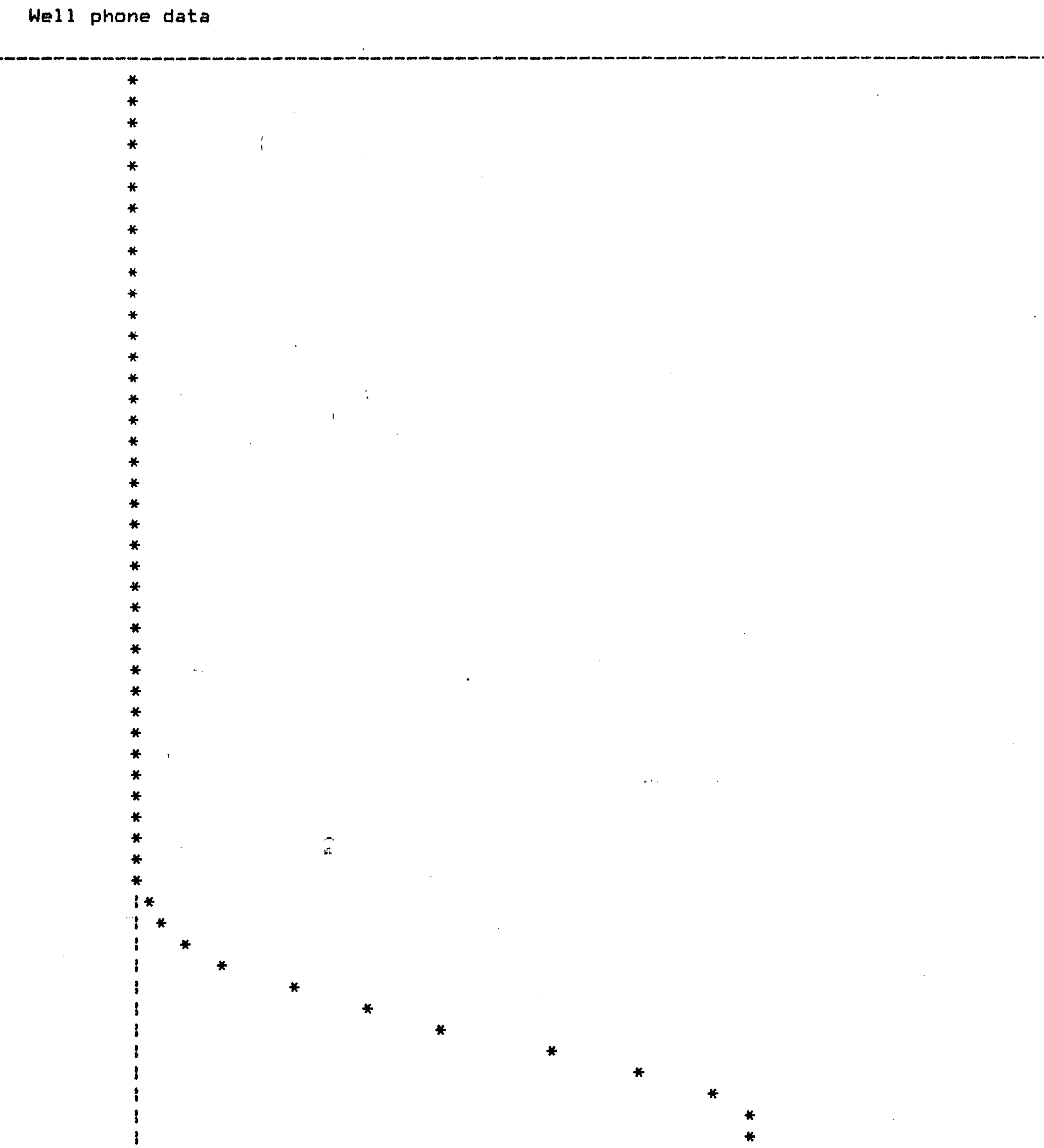


WELL PHONE CHANNEL - floating point amplifier



Data maximum (mV) : down hole channel - 97.168

FIRST ARRIVAL PLOT – Shot 32 Level 716.0



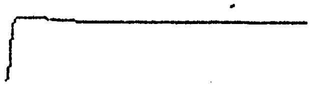
Sample time	Value uV
324.0	48.
324.5	52.
325.0	49.
325.5	42.
326.0	59.
326.5	52.
327.0	52.
327.5	43.
328.0	61.
328.5	74.
329.0	81.
329.5	78.
330.0	68.
330.5	56.
331.0	50.
331.5	50.
332.0	56.
332.5	63.
333.0	68.
333.5	69.
334.0	65.
334.5	58.
335.0	53.
335.5	49.
336.0	44.
336.5	37.
337.0	51.
337.5	39.
338.0	31.
338.5	29.
339.0	32.
339.5	38.
340.0	45.
340.5	54.
341.0	59.
341.5	104.
342.0	214.
342.5	388.
343.0	843.
343.5	2146.
344.0	3942.
344.5	7354.
345.0	12746.
345.5	24332.
346.0	36018.
346.5	49544.
347.0	66192.
347.5	79799.
348.0	90604.
348.5	96687.
349.0	97168.

TRACE DISPLAY.

SHOT 33 Time 17:41:52 Level : 668.0 Shot location : D
Shot depth : 2.0 Charge size : 0.25
No. surface samples : 128 Down hole sample nos : 59 400 949
Sample rates : 500 1000 usec Delay : 0

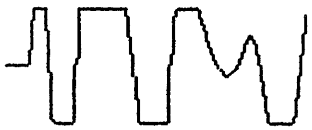
AUX. CHANNEL 1 Max. 825mV

AUX. CHANNEL 2 Max. 9995mV



AUX. CHANNEL 3 Max. 1377mV

AUX. CHANNEL 4 Max. 10000mV



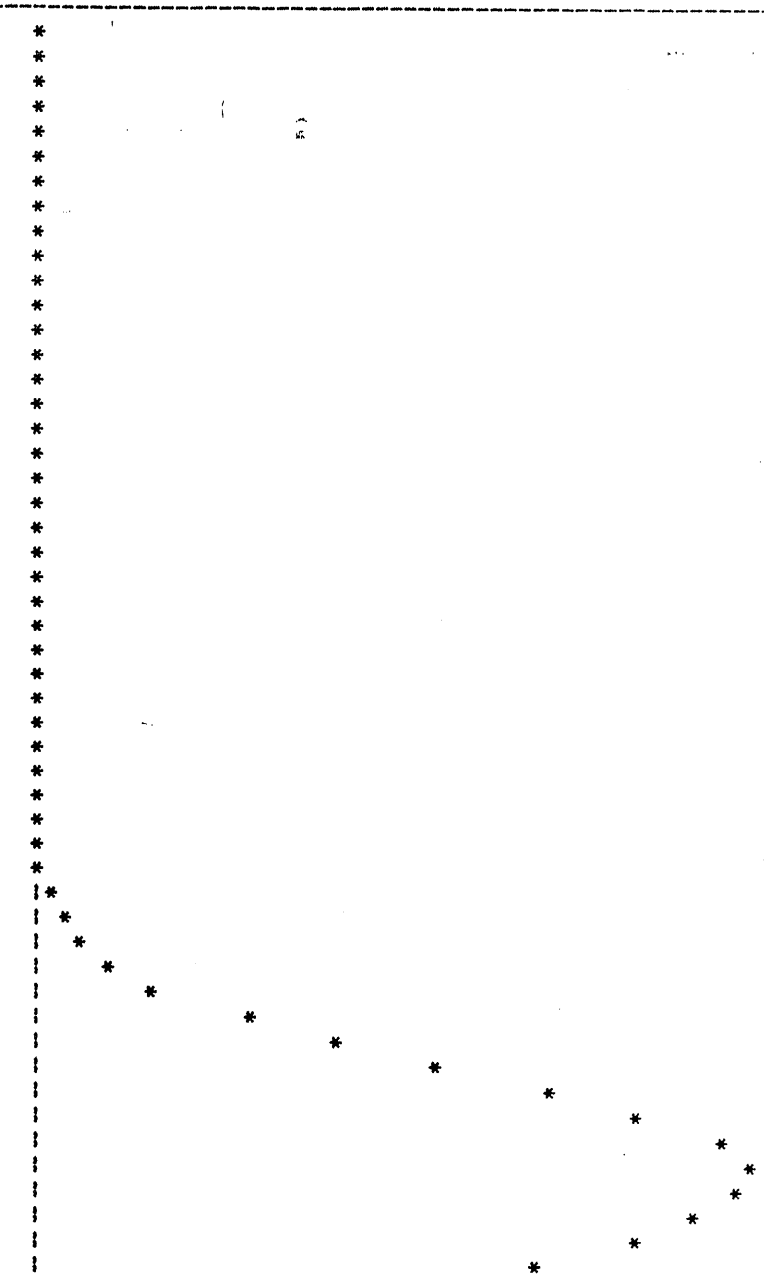
WELL PHONE CHANNEL - floating point amplifier

Data maximum (mV) : down hole channel - 68.834

FIRST ARRIVAL PLOT - Shot 33 Level 668.0

Well phone data

Sample time	Value uV
306.0	110.
306.5	115.
307.0	118.
307.5	118.
308.0	117.
308.5	115.
309.0	113.
309.5	112.
310.0	113.
310.5	115.
311.0	119.
311.5	122.
312.0	125.
312.5	124.
313.0	119.
313.5	112.
314.0	101.
314.5	90.
315.0	81.
315.5	75.
316.0	72.
316.5	70.
317.0	71.
317.5	70.
318.0	70.
318.5	72.
319.0	76.
319.5	81.
320.0	85.
320.5	89.
321.0	94.
321.5	106.
322.0	143.
322.5	267.
323.0	408.
323.5	850.
324.0	2124.
324.5	4372.
325.0	6783.
325.5	11346.
326.0	20610.
326.5	29134.
327.0	39139.
327.5	49024.
328.0	58068.
328.5	65712.
329.0	68834.
329.5	67953.
330.0	63951.
330.5	57828.
331.0	47983.

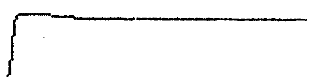


TRACE DISPLAY.

SHOT 34 Time 17:46:36 Level : 552.0 Shot location : D
Shot depth : 2.0 Charge size : 1.0
No. surface samples : 128 Down hole sample nos : 15 400 993
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 810mV

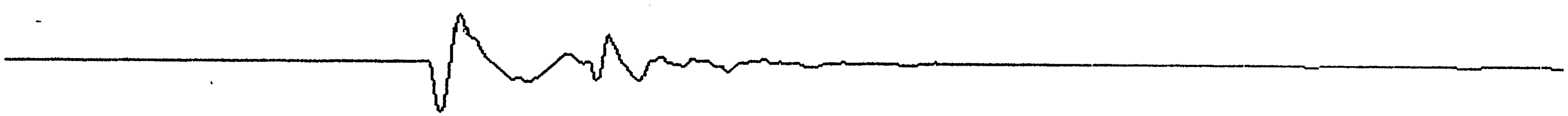
AUX. CHANNEL 2 Max. 9995mV



AUX. CHANNEL 3 Max. 1191mV

AUX. CHANNEL 4 Max. 10000mV

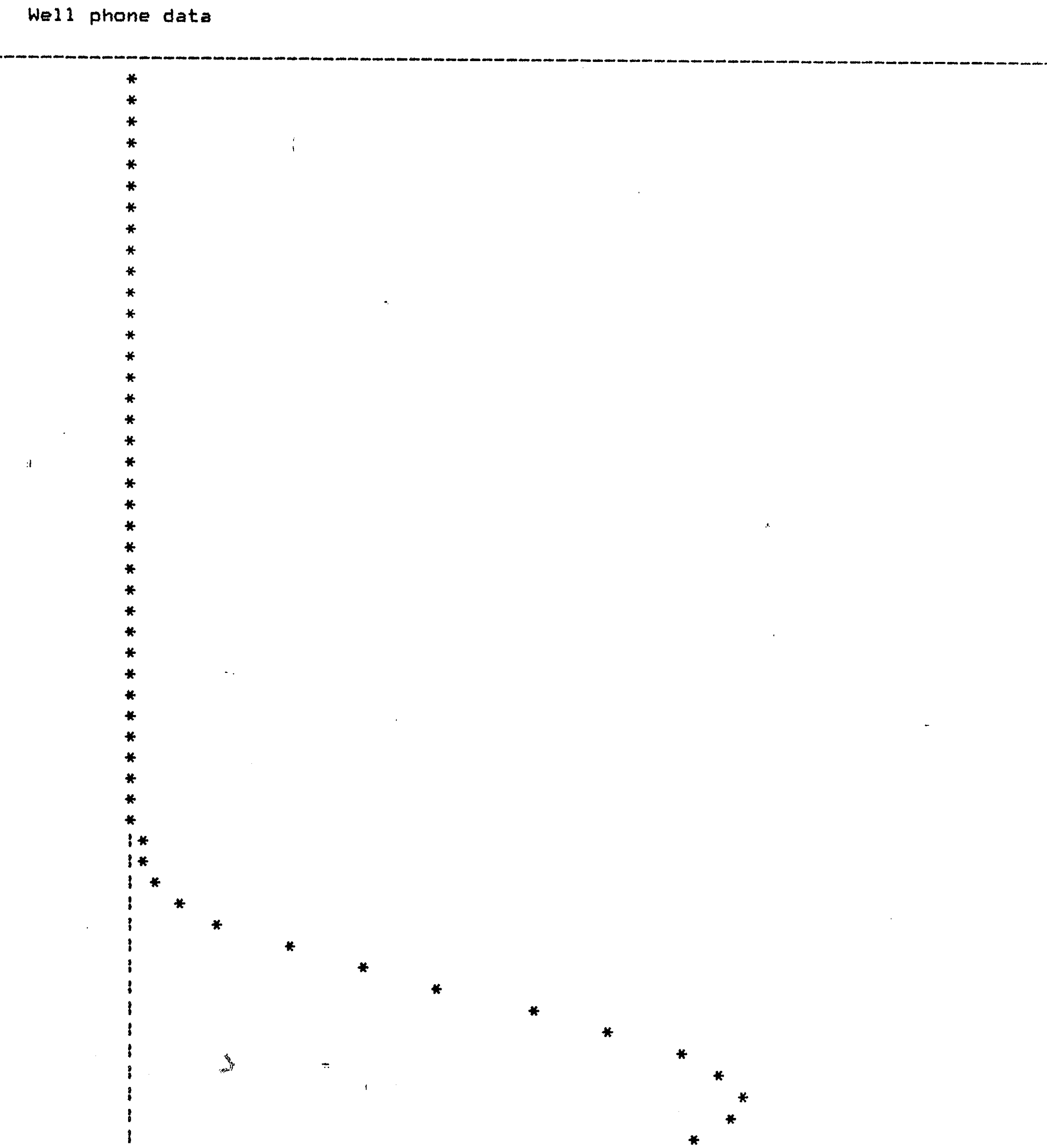
WELL PHONE CHANNEL - floating point amplifier



Data maximum (mV) : down hole channel - 98.768

FIRST ARRIVAL PLOT - Shot 34 Level 552.0

Sample time	Value uV
258.0	89.
258.5	90.
259.0	88.
259.5	83.
260.0	77.
260.5	69.
261.0	60.
261.5	53.
262.0	57.
262.5	57.
263.0	59.
263.5	68.
264.0	80.
264.5	88.
265.0	93.
265.5	93.
266.0	90.
266.5	84.
267.0	77.
267.5	69.
268.0	62.
268.5	56.
269.0	58.
269.5	55.
270.0	52.
270.5	49.
271.0	47.
271.5	46.
272.0	46.
272.5	47.
273.0	46.
273.5	45.
274.0	50.
274.5	91.
275.0	217.
275.5	427.
276.0	1218.
276.5	2571.
277.0	4562.
277.5	8264.
278.0	13907.
278.5	25412.
279.0	36738.
279.5	49504.
280.0	64832.
280.5	77638.
281.0	88203.
281.5	95487.
282.0	98768.
282.5	97328.
283.0	91245.

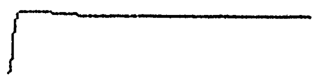


TRACE DISPLAY.

SHOT 35 Time 17:52:12 Level : 426.0 Shot location : D
Shot depth : 2.0 Charge size : 0.25
No. surface samples : 128 Down hole sample nos : 0 400 1008
Sample rates : 500 1000 usec Delay : 0

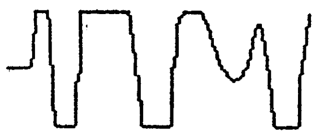
AUX. CHANNEL 1 Max. 859mV

AUX. CHANNEL 2 Max. 9995mV

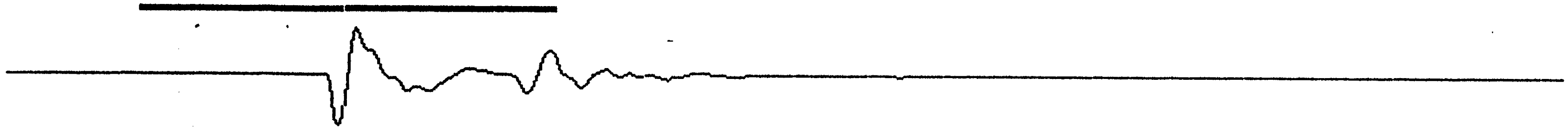


AUX. CHANNEL 3 Max. 1274mV

AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

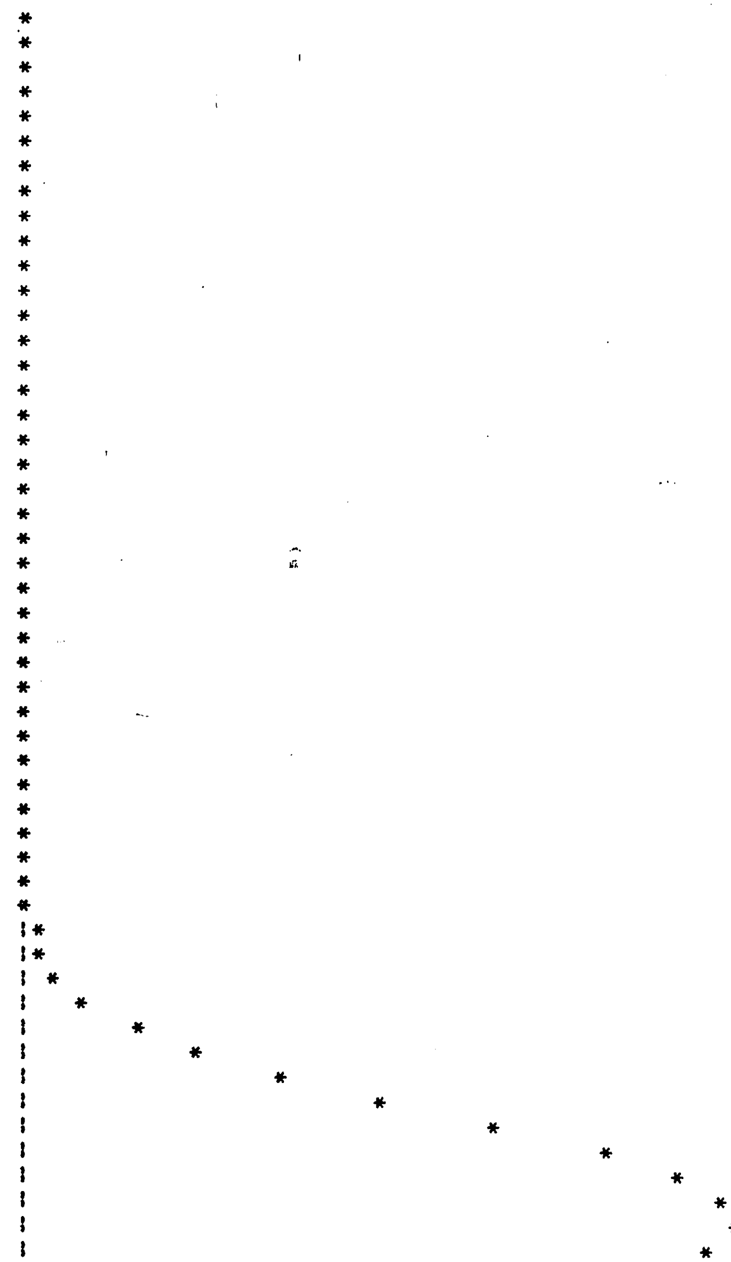


Data maximum (mV) : down hole channel - 155.596

FIRST ARRIVAL PLOT - Shot 35 Level 426.0

Sample time	Value uV
200.0	-18.
200.5	-30.
201.0	-43.
201.5	-52.
202.0	-55.
202.5	-54.
203.0	-52.
203.5	-54.
204.0	-60.
204.5	-71.
205.0	-75.
205.5	-73.
206.0	-69.
206.5	-60.
207.0	-56.
207.5	-57.
208.0	-59.
208.5	-58.
209.0	-54.
209.5	-43.
210.0	-26.
210.5	-4.
211.0	11.
211.5	16.
212.0	11.
212.5	-5.
213.0	-18.
213.5	-22.
214.0	-18.
214.5	-5.
215.0	9.
215.5	21.
216.0	41.
216.5	82.
217.0	182.
217.5	329.
218.0	702.
218.5	1751.
219.0	3544.
219.5	6263.
220.0	11476.
220.5	23812.
221.0	37698.
221.5	55667.
222.0	79319.
222.5	102210.
223.0	126142.
223.5	142470.
224.0	152715.
224.5	155596.
225.0	150634.

Well phone data

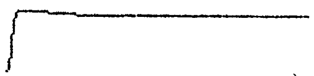


TRACE DISPLAY.

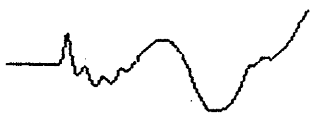
SHOT 36 Time 17:55:40 Level : 367.0 Shot location : D
Shot depth : 2.0 Charge size : 0.25
No. surface samples : 128 Down hole sample nos : 0 400 1008
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 590mV

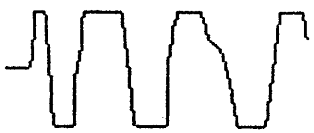
AUX. CHANNEL 2 Max. 9995mV



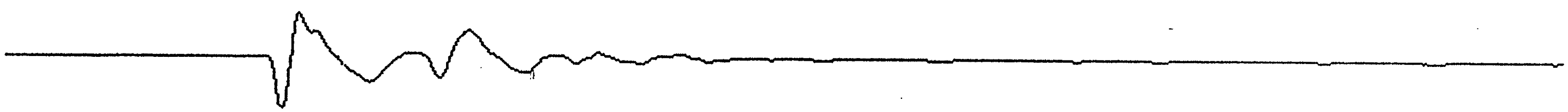
AUX. CHANNEL 3 Max. 1279mV



AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

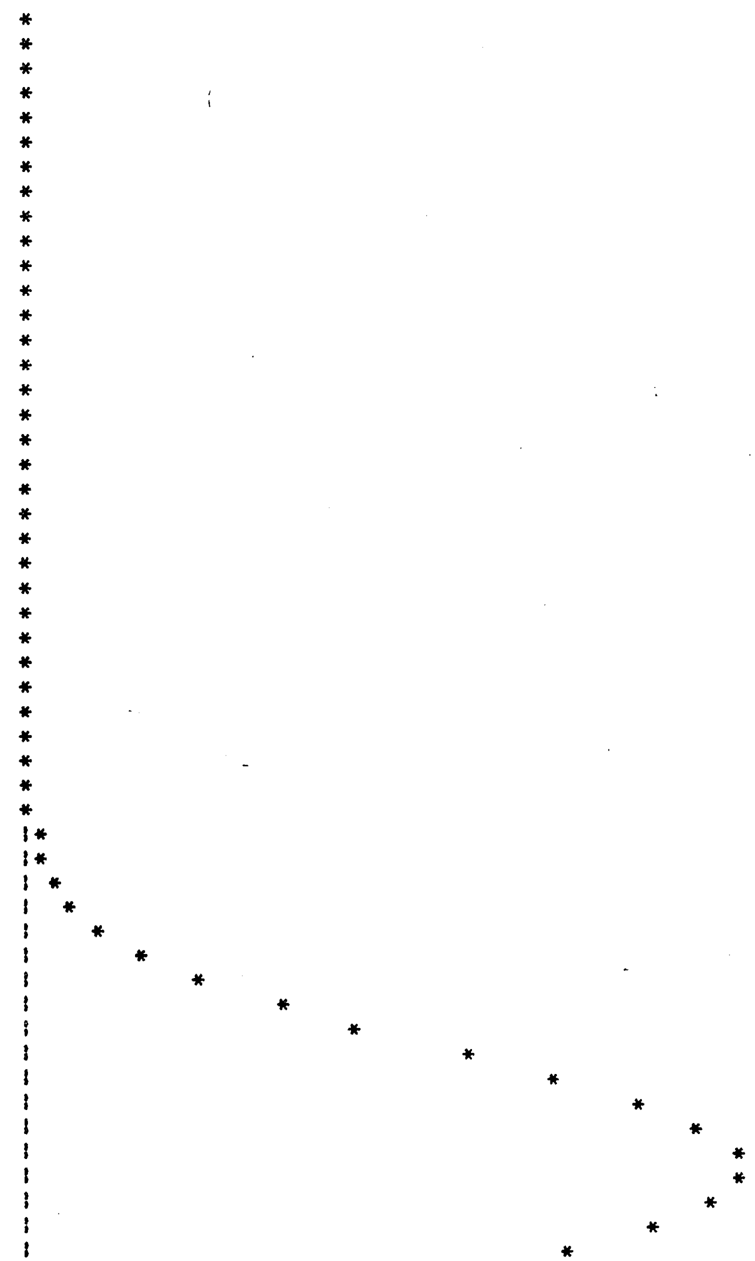


Data maximum (mV) : down hole channel - 120.459

FIRST ARRIVAL PLOT - Shot 36 Level 367.0

Well phone data

Sample time	Value uV
174.0	-15.
174.5	-18.
175.0	-29.
175.5	-97.
176.0	-176.
176.5	-256.
177.0	-272.
177.5	-248.
178.0	-154.
178.5	-87.
179.0	-50.
179.5	-85.
180.0	-123.
180.5	-141.
181.0	-118.
181.5	-63.
182.0	4.
182.5	39.
183.0	49.
183.5	35.
184.0	19.
184.5	16.
185.0	34.
185.5	58.
186.0	79.
186.5	93.
187.0	105.
187.5	132.
188.0	191.
188.5	256.
189.0	380.
189.5	570.
190.0	875.
190.5	1611.
191.0	2721.
191.5	4242.
192.0	6953.
192.5	11095.
193.0	20130.
193.5	29775.
194.0	42181.
194.5	56468.
195.0	74596.
195.5	89964.
196.0	103731.
196.5	113816.
197.0	119739.
197.5	120459.
198.0	115977.
198.5	106052.
199.0	91805.

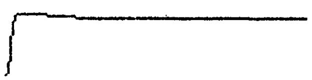


TRACE DISPLAY.

SHOT 37 Time 17:59:34 Level : 315.0 Shot location : D
Shot depth : 2.0 Charge size : 0.25
No. surface samples : 128 Down hole sample nos : 0 400 1000
Sample rates : 500 1000 usec Delay : 0

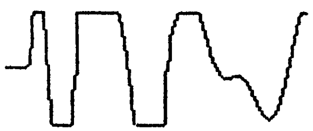
AUX. CHANNEL 1 Max. 649mV

AUX. CHANNEL 2 Max. 9995mV

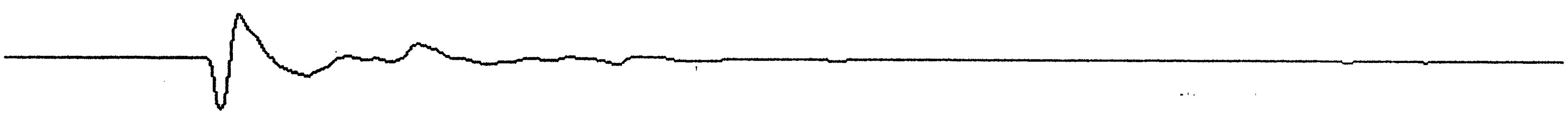


AUX. CHANNEL 3 Max. 1362mV

AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

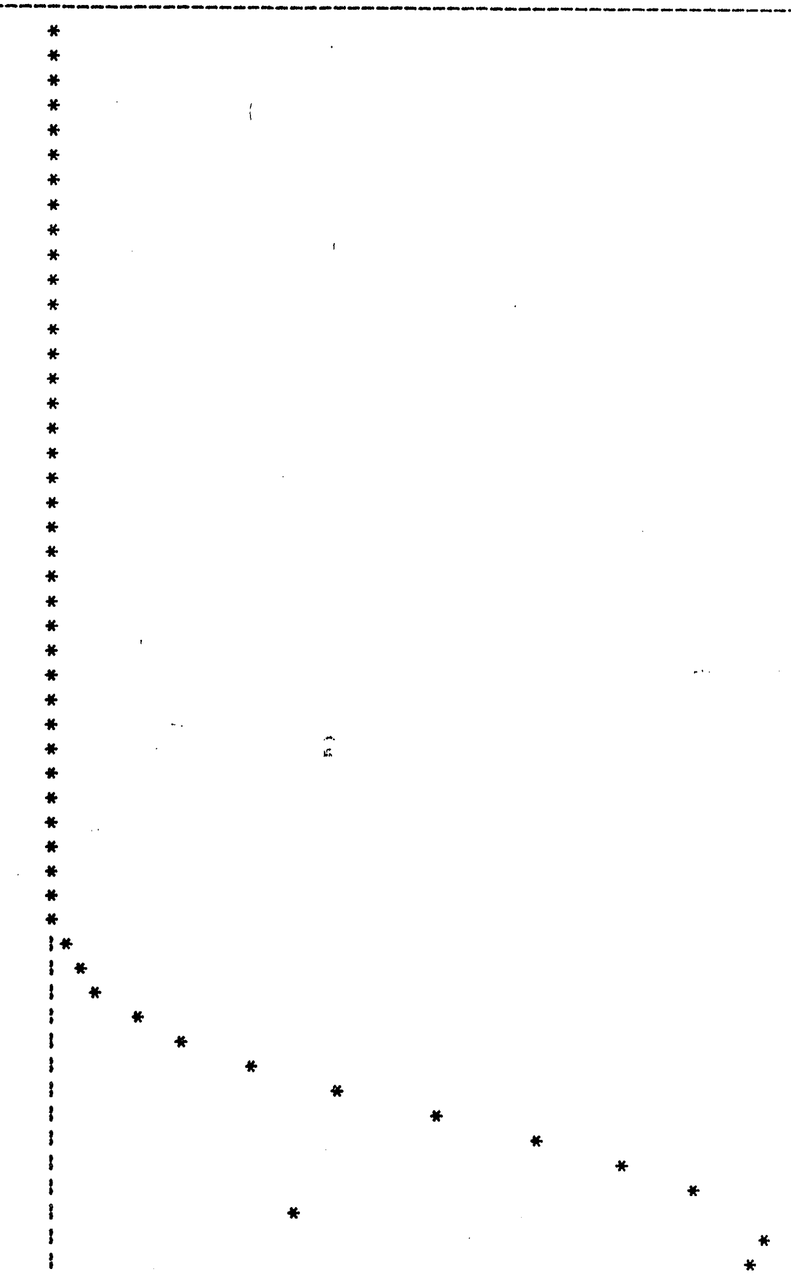


Data maximum (mV) : down hole channel - 177.207

FIRST ARRIVAL PLOT - Shot 37 Level 315.0

Well phone data

Sample time	Value uV
144.0	267.
144.5	350.
145.0	376.
145.5	260.
146.0	13.
146.5	-87.
147.0	-68.
147.5	50.
148.0	220.
148.5	286.
149.0	248.
149.5	59.
150.0	-288.
150.5	-399.
151.0	-491.
151.5	-440.
152.0	-288.
152.5	-60.
153.0	162.
153.5	325.
154.0	573.
154.5	864.
155.0	1228.
155.5	1431.
156.0	1466.
156.5	1321.
157.0	1041.
157.5	795.
158.0	480.
158.5	187.
159.0	43.
159.5	-185.
160.0	-337.
160.5	-523.
161.0	-565.
161.5	-253.
162.0	668.
162.5	3129.
163.0	6123.
163.5	11055.
164.0	21811.
164.5	33576.
165.0	48944.
165.5	71715.
166.0	94366.
166.5	118778.
167.0	143270.
167.5	160879.
168.0	61230.
168.5	177207.
169.0	174645.

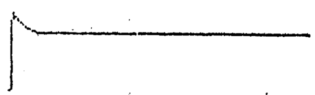


TRACE DISPLAY.

SHOT 38 Time 18:09:51 Level : 52.0 Shot location : D
Shot depth : 2.0 Charge size : 0.1
No. surface samples : 128 Down hole sample nos : 0 400 1008
Sample rates : 500 1000 usec Delay : 0

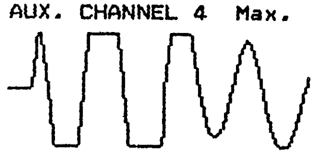
AUX. CHANNEL 1 Max. 292mV

AUX. CHANNEL 2 Max. 5727mV

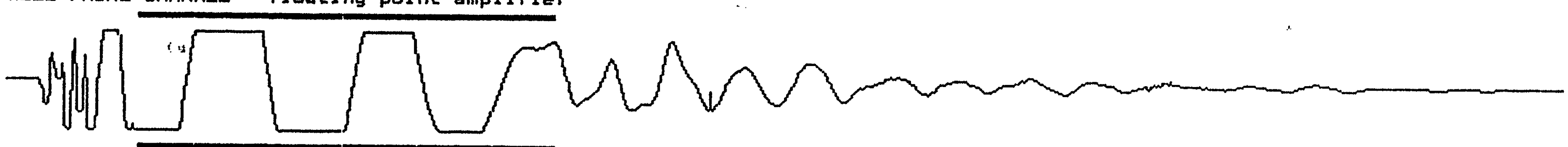


AUX. CHANNEL 3 Max. 1108mV

AUX. CHANNEL 4 Max. 10000mV



WELL PHONE CHANNEL - floating point amplifier

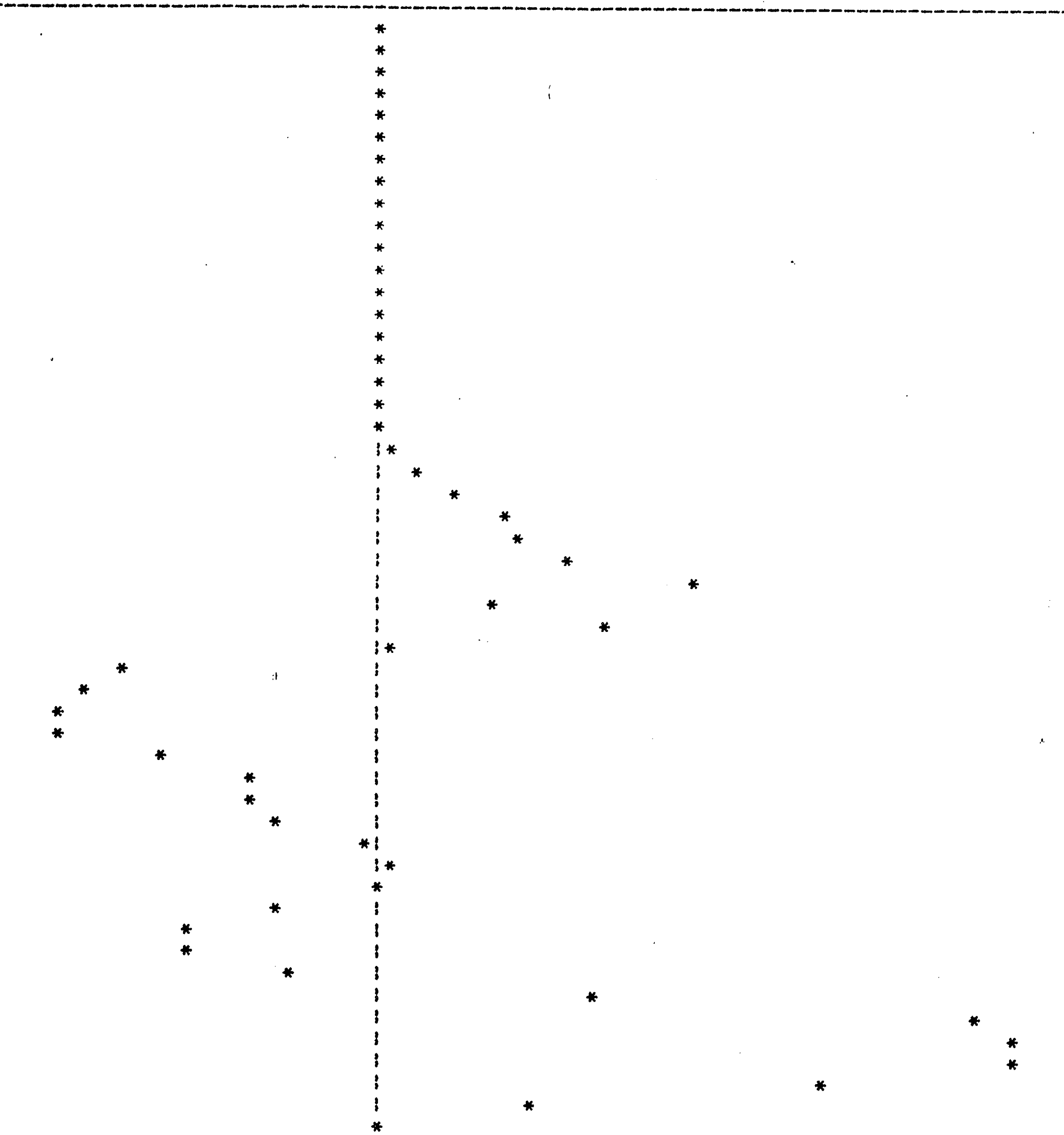


Data maximum (mV) : down hole channel - 327.840

FIRST ARRIVAL PLOT – Shot 38 Level 52.0

Sample time	Value uV
14.0	-336.
15.0	-1061.
16.0	-1903.
17.0	-1936.
18.0	-1468.
19.0	-1306.
20.0	-1441.
21.0	-1611.
22.0	-1836.
23.0	-2046.
24.0	-2056.
25.0	-1818.
26.0	-1413.
27.0	-887.
28.0	-577.
29.0	-404.
30.0	-258.
31.0	196.
32.0	1638.
33.0	5843.
34.0	20050.
35.0	41981.
36.0	64912.
37.0	74036.
38.0	95967.
39.0	162479.
40.0	60109.
41.0	120459.
42.0	9104.
43.0	-135266.
44.0	-157837.
45.0	-173525.
46.0	-167602.
47.0	-117898.
48.0	-71955.
49.0	-69714.
50.0	-59309.
51.0	-15728.
52.0	8794.
53.0	528.
54.0	-56508.
55.0	-101970.
56.0	-107092.
57.0	-51225.
58.0	109093.
59.0	307991.
60.0	327680.
61.0	327680.
62.0	227471.
63.0	80759.
64.0	43.

Well phone data

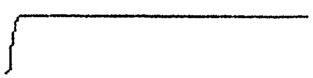


TRACE DISPLAY.

SHOT 39 Time 18:13:16 Level : 52.0 Shot location : C
Shot depth : 0.2 Charge size : G;DET
No. surface samples : 128 Down hole sample nos : 0 400 1008
Sample rates : 500 1000 usec Delay : 0

AUX. CHANNEL 1 Max. 688mV

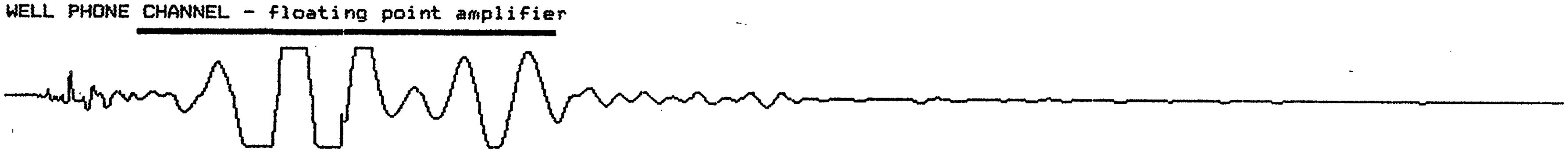
AUX. CHANNEL 2 Max. 9995mV



AUX. CHANNEL 3 Max. 24mV

AUX. CHANNEL 4 Max. 48mV

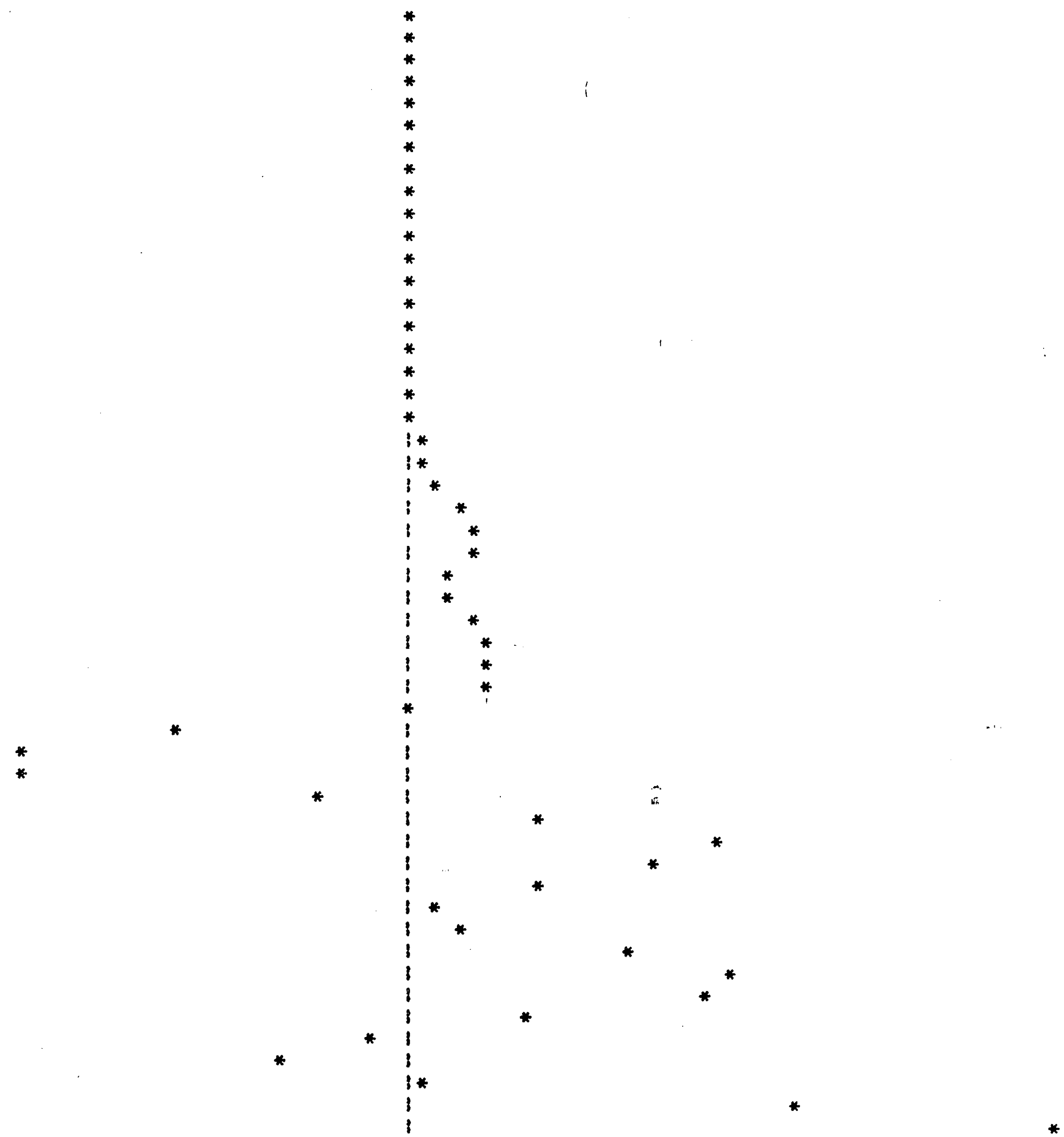
WELL PHONE CHANNEL - floating point amplifier



Data maximum (mV) : down hole channel - 327.840

FIRST ARRIVAL PLOT — Shot 39 Level 52.0

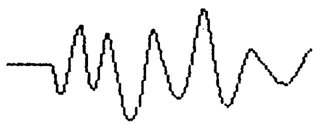
Sample time	Value uV	Well phone data
10.0	381.	
11.0	194.	
12.0	18.	
13.0	-161.	
14.0	-258.	
15.0	-408.	
16.0	-579.	
17.0	-702.	
18.0	-798.	
19.0	-909.	
20.0	-949.	
21.0	-937.	
22.0	-920.	
23.0	-794.	
24.0	-645.	
25.0	-460.	
26.0	-122.	
27.0	299.	
28.0	625.	
29.0	1143.	
30.0	1743.	
31.0	2969.	
32.0	5022.	
33.0	7184.	
34.0	6963.	
35.0	4542.	
36.0	3842.	
37.0	6443.	
38.0	8684.	
39.0	8994.	
40.0	8684.	
41.0	-1047.	
42.0	-26333.	
43.0	-50145.	
44.0	-46783.	
45.0	-11766.	
46.0	14167.	
47.0	33496.	
48.0	26573.	
49.0	14497.	
50.0	3322.	
51.0	5863.	
52.0	23211.	
53.0	34777.	
54.0	31615.	
55.0	12186.	
56.0	-5243.	
57.0	-15488.	
58.0	1026.	
59.0	42101.	
60.0	69634.	



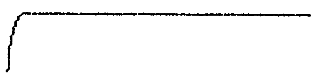
TRACE DISPLAY.

SHOT 40 Time 18:15:40 Level : 52.0 Shot location : B
Shot depth : 0.2 Charge size : G;DET
No. surface samples : 128 Down hole sample nos : 0 400 1008
Sample rates : 500 1000 usec Delay : 0

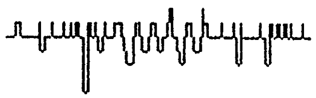
AUX. CHANNEL 1 Max. 771mV



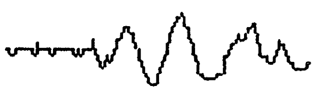
AUX. CHANNEL 2 Max. 9341mV



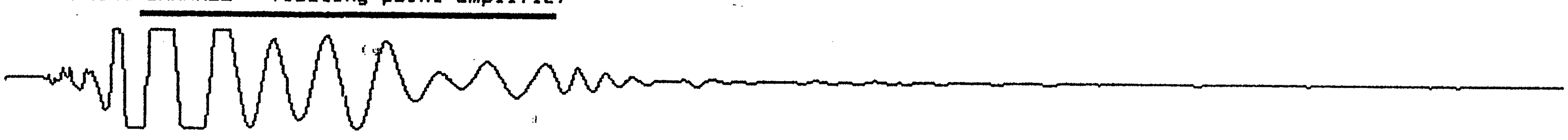
AUX. CHANNEL 3 Max. 19mV



AUX. CHANNEL 4 Max. 48mV



WELL PHONE CHANNEL - floating point amplifier

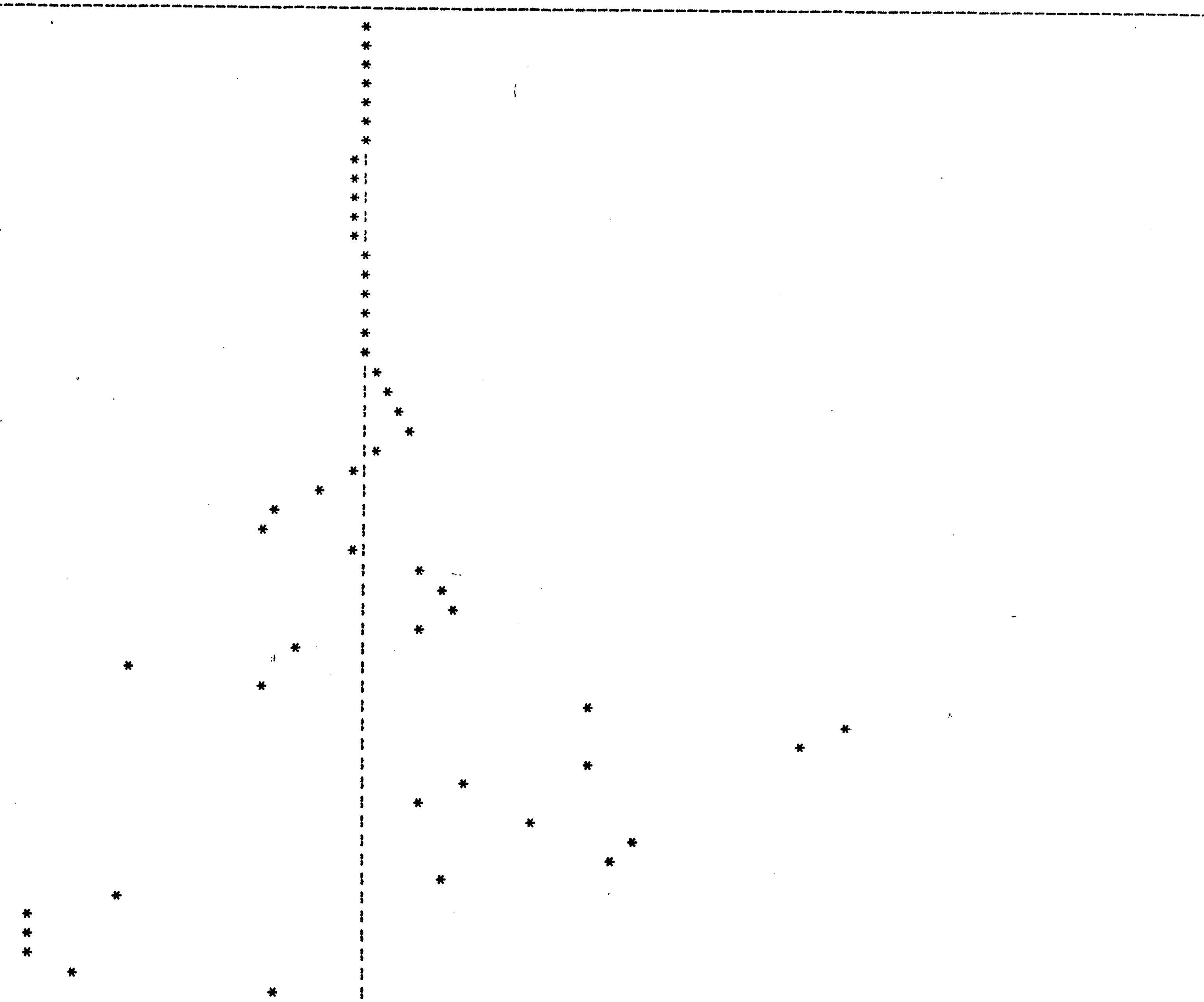


Data maximum (mV) : down hole channel - 327.840

FIRST ARRIVAL PLOT - Shot 40 Level 52.0

Sample time	Value uV
8.0	421.
9.0	-102.
10.0	-456.
11.0	-831.
12.0	-1101.
13.0	-1373.
14.0	-1711.
15.0	-2071.
16.0	-2276.
17.0	-2294.
18.0	-2194.
19.0	-2033.
20.0	-1691.
21.0	-1183.
22.0	-763.
23.0	-288.
24.0	159.
25.0	505.
26.0	1166.
27.0	2351.
28.0	4022.
29.0	4502.
30.0	1583.
31.0	-2146.
32.0	-6193.
33.0	-12006.
34.0	-12286.
35.0	-2064.
36.0	6393.
37.0	8864.
38.0	9695.
39.0	6723.
40.0	-8494.
41.0	-28334.
42.0	-12926.
43.0	25252.
44.0	54947.
45.0	49744.
46.0	26133.
47.0	11596.
48.0	6903.
49.0	18849.
50.0	31295.
51.0	28094.
52.0	8824.
53.0	-30015.
54.0	-54627.
55.0	-64031.
56.0	-56828.
57.0	-34657.
58.0	-11486.

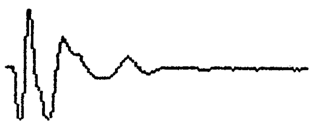
Well phone data



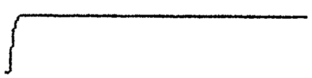
TRACE DISPLAY.

SHOT 41 Time 18:17:16 Level : 52.0 Shot location : A
Shot depth : 0.2 Charge size : G;DET
No. surface samples : 128 Down hole sample nos : 0 400 1008
Sample rates : 500 1000 usec Delay : 0

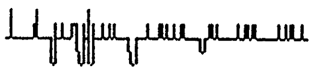
AUX. CHANNEL 1 Max. 10000mV



AUX. CHANNEL 2 Max. 9995mV

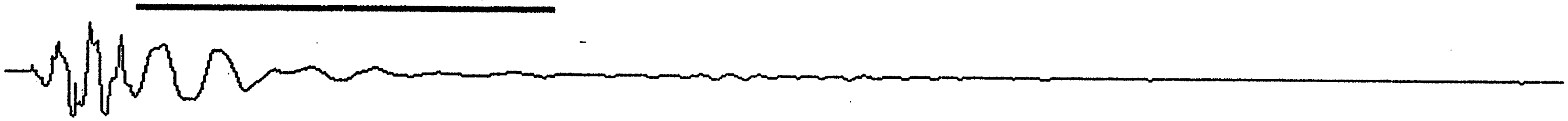


AUX. CHANNEL 3 Max. 19mV



AUX. CHANNEL 4 Max. 39mV

WELL PHONE CHANNEL - floating point amplifier

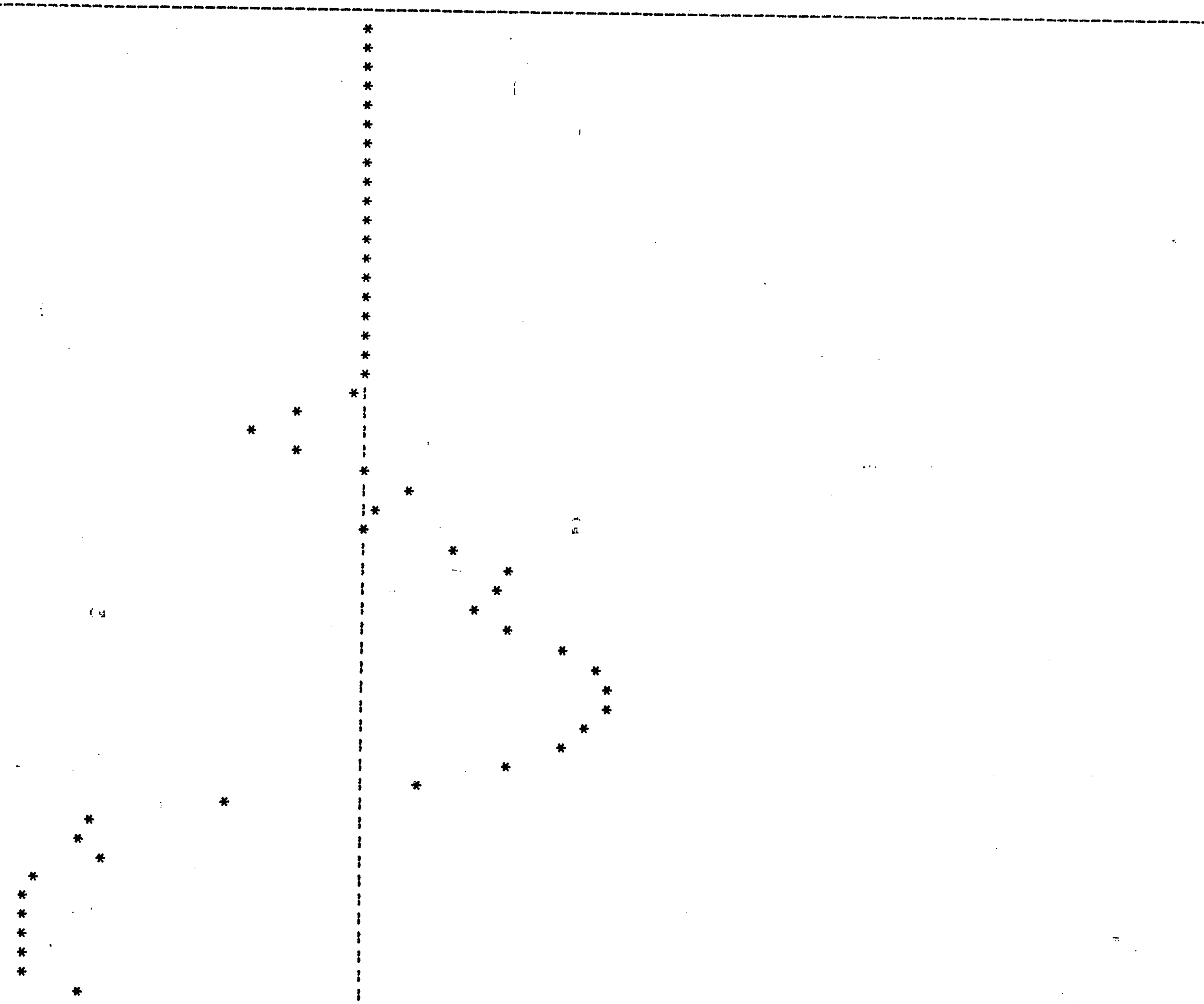


Data maximum (mV) : down hole channel - 247.801

FIRST ARRIVAL PLOT - Shot 41 Level 52.0

Well phone data

Sample time	Value uV
6.0	-23.
7.0	-420.
8.0	-844.
9.0	-1166.
10.0	-1361.
11.0	-1406.
12.0	-1321.
13.0	-1166.
14.0	-1051.
15.0	-1066.
16.0	-1268.
17.0	-1566.
18.0	-1891.
19.0	-2169.
20.0	-2319.
21.0	-2269.
22.0	-1943.
23.0	-1236.
24.0	-1343.
25.0	-5673.
26.0	-21050.
27.0	-32336.
28.0	-22251.
29.0	1364.
30.0	12656.
31.0	4282.
32.0	-720.
33.0	22971.
34.0	40100.
35.0	35938.
36.0	29054.
37.0	39219.
38.0	56227.
39.0	65632.
40.0	68514.
41.0	68193.
42.0	62270.
43.0	54146.
44.0	40140.
45.0	14927.
46.0	-40860.
47.0	-77638.
48.0	-80199.
49.0	-73796.
50.0	-90604.
51.0	-129343.
52.0	-152715.
53.0	-147592.
54.0	-121339.
55.0	-95247.
56.0	-79639.



APPENDIX O

APPENDIX O

SURVEY DATA

WINDERMERE #2 SURVEY DATA

DATADRIL

MINORA RESOURCES NL
WINDEMERE #2
VICTORIA

SINGLE SHOT DATA

16th MARCH 1989

File Name: WIND2SUR

*** RECORD OF SURVEY ***

Calculated by DATADRIL's CADDS System

Radius of Curvature Method
All Angles are Decimal

MEASURED DEPTH (M)	INCL ANGLE (DEG)	DRIFT AZIMUTH (DEG)	COURSE LENGTH (M)	TOTAL VERTICAL DEPTH	TOTAL RECTANGULAR COORDINATES (M)		CLOSURE DISTANCE (M)	CLOSURE AZIMUTH (DEG)	DOGLEG SEVERITY (DEG/30 M
0.00	0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	0.00	0.00
94.00	.25	275.00	94.00	94.00	.02 N	.20 W	.21	275.00	.08
186.00	.50	349.00	92.00	186.00	.39 N	.62 W	.74	302.34	.16
328.00	0.00	0.00	142.00	328.00	1.00 N	.74 W	1.25	323.56	.11
396.00	0.00	0.00	68.00	396.00	1.00 N	.74 W	1.25	323.56	0.00
462.00	.50	36.00	66.00	462.00	1.23 N	.57 W	1.36	335.21	.23
585.00	.50	2.00	123.00	584.99	2.23 N	.23 W	2.25	354.23	.07
720.00	.25	333.00	135.00	719.99	3.09 N	.42 W	3.12	352.34	.07
852.00	.50	36.00	132.00	851.98	3.91 N	.35 W	3.92	354.87	.10
975.00	.50	130.00	123.00	974.98	4.02 N	.60 E	4.07	8.47	.18
1098.00	.50	104.00	123.00	1097.98	3.54 N	1.55 E	3.86	23.61	.05
1180.00	.50	58.00	82.00	1179.97	3.65 N	2.24 E	4.28	31.49	.14
1309.00	1.00	68.00	129.00	1308.96	4.41 N	3.74 E	5.78	40.25	.12
1461.00	.25	28.00	152.00	1460.95	5.50 N	4.95 E	7.40	41.95	.16
1585.00	0.00	0.00	124.00	1584.95	5.74 N	5.07 E	7.66	41.46	.06
1728.00	0.00	0.00	143.00	1727.95	5.74 N	5.07 E	7.66	41.46	0.00
1802.00	.50	97.00	74.00	1801.95	5.70 N	5.39 E	7.85	43.41	.20
1850.00	1.00	117.00	48.00	1849.94	5.52 N	5.99 E	8.14	47.35	.35
1936.00	.50	105.00	86.00	1935.94	5.12 N	7.04 E	8.70	53.99	.18
2089.00	.75	92.00	153.00	2088.93	4.87 N	8.69 E	9.96	60.73	.06
2245.00	1.50	61.00	156.00	2244.90	5.58 N	11.63 E	12.90	64.38	.18

DATADRIL

MINORA RESOURCES NL — VICTORIA
WINDEMERE #2

MEASURED DEPTH (M)	INCL ANGLE (DEG)	DRIFT AZIMUTH (DEG)	COURSE LENGTH (M)	TOTAL VERTICAL DEPTH	TOTAL RECTANGULAR COORDINATES (M)		CLOSURE DISTANCE (M)	CLOSURE AZIMUTH (DEG)	DOGLEG SEVERITY (DEG/30 M)
2298.00	1.25	38.00	53.00	2297.88	6.40 N	12.59 E	14.12	63.07	.34
2442.00	2.25	45.00	144.00	2441.81	9.69 N	15.50 E	18.28	58.00	.21
2542.00	2.00	49.00	100.00	2541.74	12.22 N	18.21 E	21.93	56.15	.09
2588.00	2.00	41.00	46.00	2587.72	13.35 N	19.35 E	23.51	55.39	.18
2699.00	2.00	44.00	111.00	2698.65	16.21 N	21.96 E	27.30	53.58	.03
2878.00	2.00	56.00	179.00	2877.54	20.21 N	26.74 E	33.52	52.91	.07
3045.00	4.00	68.00	167.00	3044.30	24.31 N	34.44 E	42.16	54.79	.37
3169.00	5.00	55.00	124.00	3167.92	28.94 N	42.97 E	51.81	56.04	.34
3324.00	6.00	3.00	155.00	3322.20	41.49 N	49.93 E	64.92	50.27	.95

BOTTOM HOLE CLOSURE: 64.92 Meters at 50.27 Degrees

NOTE: (a) Insufficient Wireline on drum to run Survey's below 3324m.

(b) Survey's dropped at TD and on subsequent wiper trips were misruns due to the film being exposed to elevated temperatures for an excessive amount of time.

(c) Max.depth of dipmeter was 3200m.

ELIPSE OF UNCERTAINTY

Sii DATADRIL
Division of Smith International, Inc.

MINORA RESOURCES NL
WINDEMERE #2
VICTORIA

16th MARCH 1989

SINGLE SHOT DATA

File Name: WIND2SUR

*** ELLIPSE INPUT PARAMETERS ***

Measured Depth	Survey Instrument	Relative Depth	Misalignment (Degrees)	True Inclination	Reference Error	Drillstring Magnetization	Gyrocompass (Degrees)
0	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
94	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
186	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
328	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
396	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
462	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
585	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
720	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
852	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
975	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
1098	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
1180	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
1309	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
1461	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
1585	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
1728	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
1802	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
1850	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
1936	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
2089	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
2245	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
2298	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
2442	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
2542	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
2588	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
2699	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
2878	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
3045	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
3169	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000
3324	'Poor' Magnetic	.10000	.30000	.20000	0.00000	1.00000	0.00000

Sii DATADRIL

Division of Smith International, Inc.

MINORA RESOURCES NL
WINDEMERE #2
VICTORIA

SINGLE SHOT DATA

16th MARCH 1989

File Name: WIND2SUR

*** CALCULATED ELLIPSE PARAMETERS ***

Measured Depth	Survey Center N/S	Survey Center E/W	Ellipse Center N/S	Ellipse Center E/W	Alpha (Degrees)	Alpha Axis Normal	Alpha Axis Perp.	Beta (Degrees)	Beta Axis Normal	Beta Axis Perp.
0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.0	0.0
94.00	.02	-.20	.02	-.20	.02	.5	.5	.12	.5	9.4
186.00	.39	-.62	.39	-.62	.14	1.0	1.0	.19	1.0	18.6
328.00	1.00	-.74	1.00	-.74	-.07	1.7	1.7	.13	1.7	32.8
396.00	1.00	-.74	1.00	-.74	-.07	2.1	2.1	.11	2.1	39.6
462.00	1.23	-.57	1.23	-.57	-.02	2.4	2.4	.07	2.4	46.2
585.00	2.23	-.23	2.23	-.23	-.01	3.1	3.1	.02	3.1	58.5
720.00	3.09	-.42	3.09	-.42	-.01	3.8	3.8	.03	3.8	72.0
852.00	3.91	-.35	3.91	-.35	0.00	4.5	4.5	.02	4.5	85.2
975.00	4.02	.60	4.02	.60	.01	5.1	5.1	-.04	5.1	97.5
1098.00	3.54	1.55	3.54	1.55	.04	5.8	5.8	-.08	5.7	109.8
1180.00	3.65	2.24	3.65	2.24	.07	6.2	6.2	-.11	6.2	118.0
1309.00	4.41	3.74	4.41	3.74	.25	6.9	6.9	-.16	6.9	130.9
1461.00	5.50	4.95	5.50	4.95	.29	7.7	7.7	-.19	7.6	146.1
1585.00	5.74	5.07	5.74	5.07	.23	8.3	8.3	-.18	8.3	158.5
1728.00	5.74	5.07	5.74	5.07	.23	9.1	9.1	-.17	9.0	172.8
1802.00	5.70	5.39	5.70	5.39	.54	9.5	9.5	-.17	9.4	180.2
1850.00	5.52	5.99	5.52	5.99	-.35	9.7	9.7	-.19	9.7	185.0
1936.00	5.12	7.04	5.12	7.04	-.09	10.1	10.2	-.21	10.1	193.6
2089.00	4.87	8.69	4.87	8.69	-.05	10.9	11.0	-.24	10.9	208.9
2245.00	5.58	11.63	5.58	11.63	-.05	11.8	11.8	-.30	11.8	224.5
2298.00	6.40	12.59	6.40	12.59	-.05	12.0	12.1	-.31	12.0	229.8
2442.00	9.69	15.50	9.69	15.50	-.09	12.8	12.9	-.36	12.8	244.2
2542.00	12.22	18.21	12.22	18.21	-.10	13.4	13.4	-.41	13.3	254.2
2588.00	13.35	19.35	13.35	19.35	-.11	13.6	13.7	-.43	13.6	258.8
2699.00	16.21	21.96	16.21	21.96	-.13	14.2	14.3	-.47	14.1	269.9
2878.00	20.21	26.74	20.21	26.74	-.13	15.2	15.3	-.53	15.1	287.8
3045.00	24.31	34.44	24.31	34.44	-.11	16.1	16.3	-.65	15.9	304.4
3169.00	28.94	42.97	28.94	42.98	-.10	16.8	17.1	-.78	16.6	316.8
3324.00	41.49	49.93	41.49	49.93	-.21	17.9	18.1	-.86	17.4	332.3

17 APR 1989 @ 16:43

MINORA RESOURCES NL
WINDEMERE #2
VICTORIA

DATADRIL

ELLIPSE OF CERTAINTY

SCALE: 12 MTRS/INCH

Parameters for a Magentic Survey:

Relative Depth (Mtrs):	.10000
Misalignment (degrees):	.30000
True Inclination (degrees):	.20000
Reference Error (degrees):	0.00000
D/S Magnetization (degrees):	1.00000

MD: 3324.00 TVD: 3322.20

+ SURVEY:	41.49 N,	49.93 E
x ELLIPSE:	41.49 N,	49.93 E
Alpha:	-.21 Degrees	
Normal Axis:	17.89 Mtrs	
Perp. Axis:	18.11 Mtrs	
Beta:	-.86 Degrees	
TVD Axis:	17.41 Mtrs