

APPENDIX 1

DRILLING FLUID SUMMARY

BORROWDALE-1/2

DATE	TIME	DEPTH (m)	WT (ppg)	FV (sec)	OPERATION	FORMATION	MUD USED *
BORROWDALE-1							
2/7/88	0600	83.5			Make up and condition mud	Middle Velkerri Formation	A, B, C
	1200	93	8.6	42	Coring		A, B
3/7/88	1200	113		40	Coring		C
6/7/88	1200	116		40			A
BORROWDALE-2							
7/7/88	1200	15		35	Coring	Upper Velkerri Formation	
8/7/88	1200	39	8.4	40	Coring	Middle Velkerri Formation	
9/7/88	1200	70		40	Coring		
11/7/88	0900	82		36	Coring		A, B, C
	1500	95		38	Coring		
12/7/88	0900	107		41	Coring		A, B
	1500	115		39	Coring		
13/7/88	0000	128		36	Coring		
	0900	145		32	Coring		A
14/7/88	0000	190		32	Coring		
	1000	210	8.3	37	P.O.O.H.		
	2200	224	8.4	38	Coring		
15/7/88	1130	243	8.4	34	Coring		
16/7/88	0200	258	8.8	35	Coring		
	1300	270	8.6	38	Coring		
17/7/88	0200	286	8.9	33	Coring		
	1200	297	8.9	40	Coring		
18/7/88	0000	315	8.5	36	Coring		
	0800	328	8.7	40	Service Rig		
	1630	345	8.6	34	Coring		
19/7/88	0000	358	8.6	32	Coring		
	0900	379	8.6	37	Coring	2xA, 2xB, C	
	1500	392	8.6	36	Coring		
20/7/88	0400	403	8.4	35	Coring		
	1430	421	8.6	36	Coring		

DATE	TIME	DEPTH (m)	WT (ppg)	FV (sec)	OPERATION	FORMATION	MUD USED *
21/7/88	0000	435	8.7	31	Coring	Dolerite	A, B, C
	0900	450	8.6	36	P.O.O.H.		
	1530	457	8.6	35	Coring		
22/7/88	0400	486	8.9	31	Coring	Bessie Creek Sandstone	A, B, C
	1730	508	8.5	39	Coring		
23/7/88	1200	528	8.6	35	Coring		
24/7/88	0500	543	8.7	33	Coring		
	1000	548	8.7	33	Circulate and condition mud		
25/7/88	1730	548	8.6	35	Coring		
26/7/88	0500	563	8.7	33	Coring	Corcoran Formation	A, B, C
	2200	590	8.8	30	Coring		
27/7/88	0330	596	8.8	34	Coring	A, B, C	
	1230	610	8.7	34	Coring		

* A = CMCLV (25kg), B = New Vis (20kg), C = New Drill (25lt)

APPENDIX 2

DRILLING SUMMARY - BORROWDALE-1 & 2

BORROWDALE-1

<u>DATE</u>	<u>HOUR</u>	
30 June	1400	Set 5 inch casing at 82.6 metres in precollared hole. Cement with 28 bags class "A" cement.
	2130	Wait on cement.
1 July	0900	Nipple up BOP's
	1200	Pressure test BOP's to 1000 psi
	1300	Rig up drill floor
	1500	Run in hole with 4½ inch tricone bit (Bit No. 1)
	1730	Drill out cement plug and 2 metres of new formation
	2130	Test BOP's, Formation Integrity test.
	2300	Pull out of hole, make up CHD101 assembly (Bit No. 2) and 6 metre core barrel, Run in hole.
2 July	0100	Make up and condition drilling mud
	0600	Core with CHD101
	0700	Repair BOP, clean hydraulic oil from mud pits
	1200	Core with CDH101
	1730	Recover overshot from broken heavy weight drill collars.
	1800	Fish for snapped rods at 60 metres. Hook up and continue drilling.
	2130	Service rig
2200	Core with CHD101	
3 July	0600	Pull out fish, lay down broken heavy weight drill pipe.
	0830	Make up 3 metre core barrel
	0900	Run in hole
	1100	Run 3 deviation surveys at 34m (2°), 90m (7°) and 108m (7°)
	1145	Core with CDH101
	1600	Pressure test drill string. Failed.
	1630	Fish for broken drillpipe.
1800	Unable to retrieve rods	
4 July	0100	Lay down rods in 6 metre lengths
	0300	Service and clean rig, wait on fishing tap
	0600	Wait on fishing tap. Rods stuck in hole at 60-116.30m. Conventional tap stripped in previous attempts to release.
5 July	1730	Run fishing tool
	1800	Fish for broken drill pipe, retrieve rods, pull out of hole

<u>DATE</u>	<u>HOUR</u>	
6 July	0100	Rig down, to move rig 3m - Borrowdale-2
	0600	Plug back Borrowdale-1
	0700	Release rig Borrowdale-1, move to Borrowdale-2
<u>BORROWDALE-2</u>		
6 July	1200	Drill 7-7/8 inch hole from surface to 10 metres (Bit No. 1)
	1500	Set 7 inch conductor at 10 metres and cement with 15 sacks class "A" cement
	1630	Wait on cement, continue to rig up.
7 July	0600	Tag cement at 360 metres, drill out cement to 10m (Bit No. 2)
	0800	Core with CHD101
	1900	Replace main hydraulic pump, replace ram on chuck
8 July	0200	Core with CHD101, core sticking in barrel
	0500	Repair swivel
	0600	Core with CHD101
	1500	Survey 40 metres, 1°
	1545	Core with CHD101
9 July	1300	Survey 72 metres 3/4°
	1330	Pull out of hole. Lay down drill pipe
	1400	Pick up and ream hole with 5-5/8 inch bit (Bit No. 3)
10 July	0300	Circulate and condition mud
	0330	Pull out of hole. Lay down drill pipe and collars
	0530	Prepare to run casing
	0600	Run in hole with 5-5/8 inch bit (Bit No. 3). Hole was left too short for casing string
	0800	Drill to 73.50 metres
	1000	Set 5" casing at 72.6 metres and cement with 16 sacks class "A" cement.
	1300	Wait on cement
	1800	Nipple up BOP, run flare line, rig up accumulator
	2300	Test BOP, annular preventer, choke manifold and kelly hose to 1000 psi. O.K.
	2330	Run in hole 4½ inch bit (Bit No. 4) tag cement at 63.3 metres
11 July	0030	Drill out cement, float and 3 metres of new formation
	0330	Run in hole and wash down to 76.5 metres with CHD101 (Bit No. RR2) assembly, and perform Formation integrity test. Formation held 200 psi.
	0600	Core with CHD101
	2030	Pull out of hole. Run in hole check for core blocking bit
	2130	Core with CHD101
	2330	Replace main bearing in chuck

<u>DATE</u>	<u>HOUR</u>	
12 July	0400	Core with CHD101
	1200	Survey 105 metres, 1°
	1230	Core with CHD101
13 July	0230	Pull out of hole, Core in barrel, Run in hole.
	0415	Replace packing in swivel
	0445	Core with CHD101
	1730	Service Rig
	1800	Core with CHD101
14 July	0930	Pull out of hole, check and replace washed out drill pipe, Change bit (Bit No. 5)
	1230	Repair clutch
	1330	Core with CHD101
	1730	Service Rig
	1800	Core with CHD101
15 July	0630	Pressure test drill string - O.K.
	0700	Replace swivel
	0715	Core with CHD101, Slow coring due to fractured ground
	1215	Service Rig
	1245	Core with CHD101
	1700	Attempt to free stuck core tube
	1730	Pull out of hole to free stuck tube, collapsed bearing, Run in hole with new tube and barrel
	2300	Core with CHD101
16 July	0200	Replace swivel
	0230	Replace solenoid wire and clip on generator set
	0300	Core with CHD101
	0930	Repair leaking hydraulic hoses on chuck
	1000	Core with CHD101
	1230	Survey 271.8 metres, 1°
	1300	Core with CHD101
	1530	Adjust rig clutch
	1600	Core with CHD101
17 July	0630	Pressure test drill string - O.K.
	0700	Case with CHD101
	0800	Pull out of hole, Bit and stabilizer ring change (Bit No. RR2), Run in hole.
	1130	Core with CHD101
	1645	Dump mud tanks, clean, make up new drilling mud
	1730	Function test B.O.P's - O.K.
	1745	Core with CHD101
	2030	Pull out of hole recover dropped core in barrel. Run in hole.
2345	Core with CHD101	

<u>DATE</u>	<u>HOUR</u>	
18 July	0600	Dump mud tanks, clean, make up new drilling mud
	0645	Core with CHD101
	0800	Service Rig
	0830	Core stuck in drill rods, Pull out of hole. Locate stuck core at 30m. Run in hole.
	1000	Core with CHD101
	1300	Recover dropped core
	1400	Core with CHD101
19 July	0700	Pressure test drill string - O.K.
	0730	Repair valve seat in mud pump
	0830	Core with CHD101
	1700	Dump mud tanks, make up new mud
	1730	Core with CHD101
	2115	Attempt to set core tube
	2215	Pull out of hole. Replace bit (Bit No. RR5), adjust core tubes, Run in hole.
20 July	0315	Re-drill 3 metres of dropped core
	0345	Core with CHD101
	0800	Repair chuck, replace jaw retaining ring
	0900	Core with CHD101
	1600	Attempt to seat tube
	1630	Pull out of hole. Clear core barrel, Run in hole
	2000	Core with CHD101
21 July	0200	Repair chuck jaws
	0330	Core with CHD101
	0700	Attempt to seat core tube
	0730	Pull out of hole. Clear core barrel, replace damaged bit with Bit No. 6, replace 2 damaged rods (cracks pin and box) Run in hole.
	1230	Core with CHD101
22 July	0000	Knock core out of barrel
	0045	Core with CHD101
	0600	Adjust rig clutch
	0630	Core with CHD101
	0830	Pull out of hole. Replace damaged bit with Bit No. 7, run in hole with new 3 metre barrel.
	1330	Core with CHD101
	1430	Survey 500.8 metres, 1-3/4'
	1500	Core with CHD101
	1700	Clean mud tanks
	1730	Core with CHD101
23 July	0200	Attempt to seat core tube
	0330	Pull out of hole, remove core from barrel, Run in hole.
	0900	Core with CHD101
	1015	Replace swivel
	1045	Core with CHD101, core wedging off in tube due to heavily fractured sandstone.

<u>DATE</u>	<u>HOUR</u>	
	1600	Pull back 24 metres to recover core in pipe
	1630	Function test B.O.P. and manifold
	1700	Repair wire line
	1730	Core with CHD101
	1930	Remove jammed core from barrel
	2200	Core with CHD101
24 July	0345	Remove jammed core from tube
	0445	Core with CHD101
	0600	Attempt to seat tube
	0700	Core with CHD101
	0845	Wiper Trip
	0930	Circulate and condition hole
	1000	Pull out of hole for DST No. 1
	1130	Make up and Run in hole for DST No. 1 (520-547 metres)
	1245	Tool opened for 10 minute preflow
	1255	Initial shut in for 60 minutes
	1355	Tool opened for final flow (240 minutes)
	1755	Shut in for final pressure build up (360 minutes)
25 July	0000	Standby to Pull out of hole. DST No. 1 (wait on first light)
	0600	Pull out of hole. DST No. 1. Recover 360 metres of water, muddy at the top.
	0900	Break down DST tool
	0930	Run wire line logs. Spontaneous potential, Dual focussed Resistivity, Neutron Porosity, Density, Gamma Ray, Caliper and Sonic.
	1530	Run in hole with new bit (Bit No. 8)
	1700	Ream to bottom of hole
	1715	Core with CHD101
	1800	Attempt to seat core tube
	2000	Core with CHD101
	2145	Attempt to seat core tube
	2315	Core with CHD101
	2345	Attempt to seat core tube
26 July	0115	Core with CHD101
	1545	Tube stuck in drill string, knock down with overshot.
	1615	Core with CHD101
	1630	Pull out of hole, change bit (Bit No. 9), Run in hole.
	1945	Core with CHD101 to total depth 614.9m
27 July	1500	Survey 614.9 metres, 2°
	1600	Wiper trip
	1700	Circulate and condition hole
	1730	Pull out of hole.
	1930	Logging hole with BPB. Spontaneous Potential, Dual Focussed Resistivity, Neutron Porosity, Density, Gamma Ray, Caliper, Sonic

<u>DATE</u>	<u>HOUR</u>	
28 July	1000	Run rods in hole to 530 metres.
	1130	Set cement plug 500-530 metres (8 sacks Class "A" cement)
	1230	Wait on cement
	1930	Tag cement at 495 metres
	1945	Pull back to 85 metres.
	2245	Set cement plug 57-87 metres (8 sacks Class "A" cement)
	2345	Pull out of hole lay down drillpipe
29 July	0100	Wait on cement
	0600	Set cement plug 30 metres - surface (8 sacks Class "A" cement)
	0700	Release Rig

APPENDIX 3

TIME DISTRIBUTION

BORROWDALE-1/2

DATE	DRILLING REAMING	CORING	RECOVER DROPPED CORE	TRIPS	CONDITION MUD	SERVICE RIG	REPAIR RIG	CASING & CEMENTING	WAIT ON CEMENT	TEST NIPPLE UP BOP'S	FIT	SURVEY	TEST DRILL STRING	WIRELINE LOG	SET ABANDON PLUGS	STANDBY	FISHING	DST'S
BORROWDALE - 1																		
30/6/88								7.5	2.5									
1/7/88	4			3.5		2			9	4	1.5							
2/7/88		8.5		1	5	0.5	5											4
3/7/88		10.25		2.5								0.75	0.5				6	4
4/7/88																	24	
5/7/88				0.5													17.5	6
6/7/88															1	5	5	1
TOTAL HRS	4	18.75		7.5	5	2.5	5	7.5	11.5	4	1.5	0.75	0.5		1	52.5	15	137
%	2.92	13.69		5.47	3.65	1.82	3.65	5.47	8.39	2.92	1.09	0.55	0.36		0.73	38.34	10.95	

DATE	DRILLING REAMING	CORING	RECOVER DROPPED CORE	TRIPS	CONDITION MUD	SERVICE RIG	REPAIR RIG	CASING & CEMENTING	WAIT ON CEMENT	TEST NIPPLE UP BOP'S	FIT	SURVEY	TEST DRILL STRING	WIRELINE LOG	SET ABANDON PLUGS	STANDBY	FISHING	DST'S
BORROWDALE - 2																		
6/7/88	3							1.5	7.5									
7/7/88	2	11					5		6									
8/7/88		20.25					3					0.75						
9/7/88	10	13		0.5								0.5						
10/7/88	5			2.5	0.5			5.5	5	5.5								
11/7/88	3	16.5		3.5			0.5				0.5							
12/7/88		19.5					4					0.5						
13/7/88		21.25		1.75		0.5	0.5											
14/7/88		19.5		3		0.5	1											
15/7/88		16.75	0.5	5.5		0.5	0.25						0.5					
16/7/88		21.5				0.5	1.5					0.5						
17/7/88		15.75	3.25	3.5	0.75					0.25			0.5					
18/7/88		20.25	1	1.5	0.75	0.5												
19/7/88		19.25	1	1.75	0.5		1						0.5					
20/7/88		15.25	1	6.75			1											
21/7/88		17	0.5	5			1.5											
22/7/88		17.5		5	0.5	0.5						0.5						
23/7/88		15	1.5	6			1			0.5								
24/7/88		7.75	1	3.5	0.5													11.25
25/7/88	0.25	6.75		5										6		6		
26/7/88		21		3														
27/7/88		15		3	0.5							1		4.5				
28/7/88				5					7					10	2			
29/7/88				1					5					1				
TOTAL HOURS	23.25	329.75	9.75	66.75	4	3	20.25	7	30.50	6.25	0.5	3.75	1.5	21.5	2	6		11.25
%	4.25	60.28	1.78	12.2	0.73	0.55	3.70	1.28	5.58	1.14	0.09	0.69	0.27	3.93	0.37	1.10		2.06

APPENDIX 4

CORE DESCRIPTION

BORROWDALE - 1

Interval

Core Description

Borrowdale-1 precollared to a depth of 83.5m by Bennets Drilling Services using a Midway 10M 6½" Hammer. Hammer samples dominated by dark grey to grey black pyritic shale. Organic rich claystone.

83.5m - 85.60m

Open holed with tricone bit.

85.60m - 108.0m

Claystone. Fractured grey black to black organic rich claystone.

85.60m - 89.07m

Claystone. Grey black to black organic rich claystone with minor brown grey to brown black claystone interlaminated with lesser amounts organic material. Thinly laminated/interlaminated but generally appears massive where lighter laminae not present (<2% of lithology). Claystone has varying dips from horizontal to 20-30°. Jointing/fracturing is common. Slickensides and polished surfaces also common. Occasional quartz veining, planar lamination. Minor sandstone deformation as seen by deformation of lighter laminae. Abrupt local dip changes which may be slumping, to 50-60%. Shiny surfaces may be graphitic, very shiny, black, slippery.

89.07m - 90.0m

White calcite veining horizon - sub horizontal over 2cm interval.

90.0m - 90.84m

Crush zone. Graphitic fragments of black claystone, small particles - 2-5mm.

90.84m - 92.44m

Heavily faulted and disturbed thin crushed zones 2-5cm, disrupted layers, imbricate normal faults and small vertical fault zones of steeper dips. Dips up until this point 5 - 10°. Vary from 60° - 2° within this zone.

IntervalCore Description

- 92.44m - 101.60m Claystone. Generally shallow dipping grey black to black claystone with occasional light brown grey to brown grey to brown black laminae. Dips generally $<5^\circ$, occasional -10° , laminated/interlaminated finely disseminated pyrite throughout grey black to black claystone, organic rich.
- 101.6m - 101.70m Crush zone. Dips start to increase and reach approximately 70° immediately before 10cm of grey black to black powdered claystone. Beds vertical immediately below, heavily jointed, easily dislocated. Some beds steeper, with dips from approximately 45° to 90° and overturned.
- 103m - 105.87m Claystone. Dips back down to $5 - 10^\circ$, same lithology. More common lighter coloured interlaminated 3 - 10%. Joints with dark brown reflective mineral possibly bitumen? Appears micaceous at first.
- 105.87m Abundant slumping and contorted bedding and calcite veins.
- 106.42m - 106.48m Thin reticulate lenses pyrite and grey shale or chloritic substance and grey black to black mineral. Pyrite concentration at basal 2cm calcite matrix. Also shiny black substance at contact with claystone below - appears graphitic or bituminous.
- 107.90m - 108.0m Thin calcite/pyrite lens. Unusual texture pyrite at top, calcite and black shale at base. Reticulate to inverted dishes, teepees etc. cone in cone?
- 108.0m - 110.1m Black to grey black claystone with no structure visible. Appears massive. As this unit approaches 110.0m, thin horizontal regular, planar and sub vertical contorted claystone veins occur.
- 110.1m - 110.94m Very light grey to medium light grey calcite interval with sub vertical fractures vesicles/vughs filled with bitumen/pyrite/sphalerite and triangle-wedge shaped pyrite. Pyrite especially common in vertically fractured lower part unit. Abrupt contacts above and below characterised by thinly laminated almost dendritic pyrite laminae over 0.5 to 1cm in dolomitic claystone. Light brown-grey in basal 40cm, yellow orange fluorescence dull. Some bright fluorescence in vughs.

Interval

Core Description

- 110.94m - 114.84m As for unit above carbonate, dips uniformly low 5 - 10° microfaulting - reverse sense, occasionally lighter with abundant disseminated pyrite. Dip steepens towards base to 30° for basal 2m.
- 114.84m - 116.3m Crushed and fragmented grey black to black claystone. White mineral effervescing on fracture surfaces? Dips at base crush zone to 45°, lithology constant.

EOH

BORROWDALE - 2

Interval

Core Description

Rotary drilled to 10.0m, cored in 101mm from there and later reamed to 5 5/8".

10.2m - 18.30m

Siltstone/claystone, grey-orange-pink to grey-orange, thinly bedded to laminated, dipping steeply at approximately 30°. Weathered zone - passes down into fresh rock gradationally. Abundant vertical to sub vertical joints/fractures and small fractured zones = "crush zones".

15.5m - 16.5m

Particularly fragmented - small fragments and clay pug. Still orange-pink to brown weathering colours.

18.30m - 46.30m

Light greenish grey to grey siltstone/claystone - interlaminated with occasional carbonaceous laminae, generally regularly planar laminated, occasional lensoidal carbonaceous material. Carbonaceous laminae, dark grey claystone - carbonaceous matter forms less than 10% rock. Occasional pyrite. Dips still steep, 20 - 30°.

22.0m

Very fractured and faulted, abundant crush zones. Bedding (dip) varies from horizontal to 5°, to 45°. Fracture type normal and reverse with 5 - 10cm pug zones with totally brecciated and crushed claystone. Crush zones at 25.0m, 25.30m, 27.0m to 27.30m.

Siltstone/Claystone. Calcite veins commonly occur near crush zones. Associated pyrite. Lithology uniform with varying occurrence of carbonate laminae. Generally becomes more common towards base of unit with least occurrence at 32.0m - 37.0m. In this region massive Light green-grey to light bluish-grey dominant. Occasional faulting, both micro & major faults. Dips varying from horizontal to 45°, generally below 30°.

41.0m - 41.3m

Large crush zone fractured lenticles green-claystone, vertically strung out over 30m. Minor carbonaceous layering defines dip - almost vertical, chlorite surfaces totally cataclased. Minor crush zones 1m below.

Dips above 41.0m @ 5-10°, below 45-60°. Carbonate layering increasing steadily to 15-20%.

Gradational change to unit terminated by dark green - green-black carbonaceous claystone - siltstone.

Interval

Core Description

- 46.30m - 55.0m Brown-Black Claystone - Siltstone. Disseminated pyrite throughout, abundant yellow-white calcite veins. Occasionally green-grey laminae - thin beds in top 2m of unit, grade down into thin laminae, about 2% of unit. Beds occur only very rarely below 54.0m.
- Top 4-5m of unit abundant fracturing with associated calcite veining. Pyrite & sphalerite associated in calcite veins.
- Bedding generally planar dipping 10-15°. Occasional steeper dips, 50-60°. Thin crush zones which contain only fragmented rock.
- Thin light grey - green-grey siltstone laminae around approximately 54m with light grey continuous unit above. Thinner discontinuous and very rare below 55.0m.
- 55.0m - 75.0m Uniformly massive below 55.0m. Brown-black organic rich claystone - siltstone. Pyrite nodules & disseminated pyrite common. Ubiquitous abundant vertical jointed bedding, from 10° - 45° and occasionally steeper.
- Occasional tee-pee like contorted structures, rare graphitic chlorite surfaces or fractures common. Internal structure. Very finely laminated to massive. Dips increase downwards.
- At about 62m - dips = 60-70°. Characteristic features as above.
- Graphitic-chloritic, fractured, abundant disseminated pyrite. Occasional pyrite nodules, carbonaceous in the extreme.
- 75.0m - 113.40m Bedding 30° to very steep to vertical. Minor puggy claystone laminae, <1mm to 2cm in thickness. No Visible Porosity.
- 113.40m - 114.20m Recrystallised dense dolostone, strongly fractured. Fractures annealed with calcite. Minor oil shows in vughs & along some fractures. Moderate HC odour. Oil dark-medium brown, fluorescence pale yellow. Bubbles on exposure to air. No Visible Porosity.
- 114.20m - 130.05m Dark grey siltstone-claystone as above, finely & faintly laminated, very strongly fractured. Fractures annealed with calcite below overlying dolostone. No visible porosity. Core badly broken to pulverised.

IntervalCore Description

130.05m - 130.30m Recrystallised dense dolomite. Fractures rare. Vughs filled with calcite & pyrite. No visible porosity. Claystone/siltstone as above, rarely faintly laminated, strongly fractured. Many fractures annealed, filled with calcite & pyrite.

139.25m - 140.05m Sample taken for sulphide analysis @ 139.65m. Recrystallised dense dolostone, strongly disrupted and fractured. Fractures filled with calcite and pyrite. No visible porosity. Laminated to bedded greyish black claystone/siltstone with interlaminae of pale grey siltstone and medium grey dolostone. Bedding around 25° - 30° very strongly fractured, filled with calcite and pyrite. No visible porosity.

143.10m - 143.50m Densely recrystallised dolostone, strongly fractured, filled with calcite, pyrite and pyrrhotite.

143.50m - 191.80m Faintly to strongly flat laminated claystone/siltstone as above. Medium grey claystone laminae and thin beds becoming more frequent with depth. Dip constant, now 25°. Fracturing becoming less significant with depth (50% of core by 191.80m). Core now broken with moderate fracturing. At 162.10m - 1cm of horizontal clear calcite. Occasional sulphide and calcite veins - subvertical to subhorizontal.

191.80m - 226.38m Silty claystone, faintly flatly laminated. No medium grey laminae. Sulphide rich beds (eg around 8.0 cm thick. Sulphide rich bed around 195.14m (Sampled) and at 202.76 (Sampled)). 5.5cm thick recrystallised medium grey limestone bed around 200.90m and 202.93m. No Visible porosity.

(176.0m - 2.10m) Gas chromatograph reading spikes up to 80 units. Origin is gas being liberated from organic rich claystones when drilled. Occasional intervals bubble gas from core through mud coating for a few to 10 minutes. Interval (black claystone) 209.00m-209.60m bubbled reasonably well - was immediately wiped clean and sealed in short sections (core was broken).

209.00m - 209.11m Please Note core under seal is
209.11m - 209.24m incorrectly labelled because of
209.24m - 209.39m drillers meterage error.
209.39m - 209.53m Core Labelled 210.0
209.53m - 209.60m when should read 209.0.

Occasional 2cm-6cm interbeds of coarsely recrystallised dolostone and limestone. Boundaries with surrounding claystone usually sharp, sometimes disturbed. These intervals become more abundant and less well defined towards base of unit.

<u>Interval</u>	<u>Core Description</u>
226.38m - 226.41m	<u>3cm disturbed claystone.</u> Leached, chloritic alteration makes base of overlying grey-black claystone. Sulphides and calcite occurs as irregular thin veins/laminae.
226.41m - 282.4m	<u>Light bluish grey - medium grey massive claystone,</u> poorly to non bedded, occasional wispy laminations of darker claystone. Parts very easily and decrepitates rapidly on exposure. Uppermost 22cm bleached to very light grey-white indicating exposure to a different hydrogeochemical regime prior to deposition of overlying claystone.
282.4m - 320.02m	As above. Occasional intervals medium grey to medium bluish grey and very minor dark grey to greyish black; then laminae and clay clasts of disrupted laminae, indicating some current deposition.
312.7m - 312.8m	Faint HC odour in grey black claystone.
320.02m - 320.06m	4cm disturbed bed of light grey-medium grey recrystallised dolomite and calcite mixed with clay, grading to:
320.06m - 348.0m	<u>Claystone</u> - medium grey-dark grey, becoming darker with depth. Slightly silty, silt component increasing with depth. Partly bedded to weakly laminated, disrupted black laminae, minor graded bedding. Bedding and slumping indicate possible turbidity flow, pyritic.
348.0m - 365.0m	<u>Siltstone/Claystone</u> - gradual transition to clayey siltstone. Dark grey to greyish black becoming darker with depth. Finely laminated to non-laminate. Scoured base to minor graded siltstone/claystone sets. Small scale slumping, pyritic, grading to:
365.0m - 374.90m	<u>Siltstone</u> greyish black to black, weakly to non laminate. Hard, micaceous, pyritic moderate HC odour.
374.90m - 375.02m	<u>Dolomitic siltstone</u> with oil staining along laminae. Yellow fluorescence, pale blue crush cut. No visible porosity.
375.02m - 384.60m	<u>Siltstone</u> - Medium dark grey - dark grey, micaceous poorly bedded to weakly laminated. Scour and fill, minor graded bedding. Hard, traces of pyrite. Possible dead HC around 381.7m (no cut). No visible porosity.

<u>Interval</u>	<u>Core Description</u>
384.60m - 409.24m	<p><u>Siltstone</u> - Medium light grey - dark grey & minor very fine grained silty quartz sandstone with pervasive silica and dolomite cement. Siltstone laminated to thinly bedded. Scour and fill, graded bedding, slumping (small scale). No visible porosity.</p> <p>Silty sandstone interbeds have a brown HC staining occasionally bubbling minute quantities of gas. Strong heavy HC odour, pale yellow fluorescence, pale blue crush cut, minor pyrite, galena. Dips 0-4°. No visible porosity.</p>
407.24m - 411.90m	<p><u>Siltstone</u> - dark grey faintly laminated to poorly bedded dip 5-15°. No visible porosity.</p>
411.90m - 431.00m	<p><u>Siltstone/Sandy Siltstone</u>: Medium light grey - medium grey with very fine quartz sand, poorly bedded, very hard. Dip 1-2°. No visible porosity.</p>
431.00m - 433.7m	<p><u>70% Sandstone</u>. Silty, light grey to medium grey, fine to very fine grained quartz sandstone. Sub-rounded to rounded, poorly sorted, very strongly silica cemented, very minor calcite cement. Thinly bedded to laminated, moderately strongly fractured - fractures reasonably well healed. Porosity not less than 5% and mainly as fine fractures. Fair oil show 30% - 50%, staining, light oil, faint HC odour. Pale yellow and pale blue fluorescence, pale blue streaming crush cut mainly in fine partially quartz healed fractures and rare pore spaces. Interbedded with 30% sandy siltstone - medium grey - medium dark grey, micaceous, weakly laminated. No visible porosity.</p>
433.7m - 434.5	<p><u>Hornfels</u> - dark grey, conchoidal fracture, hard but scratches easily. Very minor fractures with mobile oil bleeds, fluorescence moderate to bright blue. No visible porosity.</p>
434.50m - 443.80m	<p><u>Dolerite</u> - Medium dark grey, fine grained very minor fractures with minor oil bleeds as for interval above. No visible porosity.</p>
443.80m - 508.7m	<p><u>Dolerite</u> - As above, medium grained. No visible porosity.</p>
508.7m - 522.4m	<p><u>Dolerite</u> - Medium dark grey, fine grained, moderately fractured. Most fractures closed, few open with white - pale blue fluorescing oil stain. Not less than 1% visible porosity.</p>

<u>Interval</u>	<u>Core Description</u>
524.4m - 526.47m	<u>Dolerite</u> - Chilled margin. No visible porosity.
526.47m - 528.2m	<u>Quartzite</u> - Light grey - medium light grey. Medium sized quartz grains, well sorted - moderately well sorted, well rounded, patchy welding 60% strongly silica cemented. Patchy porosity as partially cemented laminae or very thin lenses, up to 8mm thick and as fine fractures. Visible porosity very irregular 0 to 10%, average about 6%. More porous zones associated with silty matrix, pale brown oilstain, pale blue fluorescence, pale blue crush-cut.
528.2m - 536.0m	<u>Quartzite</u> - light grey, fine to medium grain size, poorly to moderately well sorted, well rounded, strongly welded, very minor visible porosity (Not less than 2%). Oil stained - pale brown, very faint HC odour, whiteish - blue fluorescence, pale blue crush-cut. Sealed Samples 527.40 - .44 534.10 - .80 536.60 - .76 539.42 - .80 542.09 - .13 543.52 - .68 544.72 - .81 Core badly fractured 533.80 - 536.10
536.0m - 542.1m	<u>Sandstone</u> - light grey, fine to medium grained, moderately well sorted, rounded to well rounded quartz grains, strongly silica cemented. Moderately strongly fractured, porosity 0 - 5%, very patchy.
542.1m - 546.9m	Shows:
546.9m - 551.0m	Weaker yellow & blue.
554.1m - 554.7m	Blue
555.0m - 555.7m	Yellow & Blue
548.0m	With increasing depth Sandstone becomes finer grained, poorly sorted to moderately well sorted. Quartz grains sub angular to sub rounded. Poorly bedded, strongly silica cemented. Visible Porosity 2% - 6%.
568.7m - 584.26m	As above - but sand grains becoming angular, sub-angular, irregular.

Interval

Core Description

- 584.26m - 584.34m (sample sealed) Bedding with very dark bituminous HC material with faint HC odour, nil to weak yellow fluorescence, good blue ring crush cut. T.S. sample taken around 580.18m.
- 585.70m - 587.50m Sandstone - light grey - medium dark grey, minor silt, increasing with depth. Siltstone intraclasts and interbeds, disturbed poor bedding. Very dark grey dead bituminous material. Fair oil show 584.26 - 585.80 (see show report No.6) - 3 samples taken and sealed for K, So, Sw, (584.26, 584.35, 585.70). Visible porosity 2 - 6%.
- 587.50m - 614.9m Siltstone - Medium grey - greyish black thinly bedded to weakly laminated. Very minor clay, minor graded bedding, scoured bedding planes, abundant dewatering, pyrite. No visible porosity.
- 614.9m T.D. deviation 2°. Strapped Depth 614.50m.

APPENDIX 5

AUSTRALIAN DST REPORTS

BORROWDALE 2

COMPANY NAME: Pacific Oil & Gas

WELL NAME : Borrow Dale # 2
LOCATION : McArthur Basin
TICKET # : 1502
D.S.T. # : One

COMPANY NAME: Pacific Oil & Gas
 WELL NAME: Barrow Dale # 2
 LOCATION McArthur Basin
 INTERVAL 519.84m TO 547m

KB ELV N/A ft
 GR ELV N/A ft
 TOTAL DEPTH 1794.62ft

DATE: 88-07-25
 T# 1502 DST # One
 FORMATION: Bessie Creek
 TEST TYPE: Bottom Hole

RECORDER DATA ALL MEASUREMENTS ARE 'IMPERIAL'

REC.#	13781	13782				
RANGE	3900	3775				
CLOCK	Hr.	Hr.	24 Hr.	24 Hr.	Hr.	Hr.
DEPTH	1788.06		1788.06			
	PSI	PSI	PSI	PSI	PSI	PSI
A			786.7	788.1		
B			81.7	90.4		
B1			87.5	94.1		
C			744.2	741.6		
D			118.3	131.9		
			559.8	558.5		
F			740.3	740.7		
G			773.2	774.2		
D1						
E1						
F1						

TIME DATA [CONVENTIONAL]

	HR.	HR.	MIN.
PF FR	12:45	TO 12:55	10
IS FR	12:55	TO 13:55	60
SF FR	13:55	TO 17:55	240
FS FR	17:55	TO 23:55	360
TFL FR	__:	TO __:	__
TSI FR	__:	TO __:	__
T STARTED			10:00 Hr.
T ON BOTTOM			12:40 Hr.
T OPEN			12:45 Hr.
T PULLED			06:00 Hr.
T OUT			09:00 Hr.

TOOL DATA

TOOL WT.		Lb.
WT SET	25 000	Lb.
WT PULLED		Lb.
INITIAL STR. WT		Lb.
UNSEATED STR WT		Lb.
BTM. CHOKE SIZE	.75	In
HOLE SIZE	4.3	In
D. COLLAR ID	NIL	In
D. PIPE ID	3.126	In
D.C. LENGTH		ft
D.P. LENGTH	1709.97	ft

MUD DATA

MUD TYPE	Polymer
WEIGHT	8.7 Lb./ft
VISCOSITY	34 cp
WATER LOSS	
FILTER CAKE	
MUD DROP	No ft

GENERAL DATA

AMOUNT OF FILL	NII	ft
BTM HOLE TEMP	N/A	'F
NET PAY		ft
POROSITY		%
API GRAVITY		
HOLE CONDITION	Good	
PACKER SIZE	3.5x1.5x20	In
NO. OF PACKERS	1	
CUSHION AMOUNT	None	ft
CUSHION TYPE	None	
REVERSED OUT	No	
TOOL CHASED	No	
TESTER	R. Smith	
CO. REP.	G. Westie	
CONTRACTOR	Rock Drill	
RIG #	18	/G02

O/I INSIDE INSIDE OUTSIDE OUTSIDE OUTSIDE OUTSIDE

RECOVERY FLUID

TOTAL 1181.10ft of - ft In D.C. & 1181.10ft In D.P.
 360m of Water - muddy at the top.

BLOW MEASUREMENTS:

TIME	PRESSURE
min.	psi
20	3.0
50	5.0
70	5.0
90	4.0
120	4.0
180	3.0
210	2.0
240	1.5

REMARKS:

PREFLOW: Weak air blow slowly increasing to moderate bubble to bottom of bucket in 1 minute. 2 psi on the manifold gauge.

SECONDFLOW: Weak air blow slowly increasing, bubble to bottom of bucket in 3 minutes. Increased to a moderate blow. No fluid to surface. See pressure measurements above.

TEST SUCCESSFUL
Original Charts to Customer

[CONVENTIONAL]

WELL NAME Borrow Dale # 2

LOCATION McArthur Basin

TICKET # 1502 D.S.T.# One DATE 88-07-25

TOTAL TOOL TO BOTTOM OF TOP PACKER 18.96

INTERVAL TOOL 32.01

BOTTOM PACKERS and ANCHOR .

TOTAL TOOL 50.97

DRILL COLLAR IN INTERVAL .

D.C. ANCHOR ___ STANDS ___ SINGLES TOTAL 57.09

D.P. ANCHOR ___ STANDS ___ SINGLES TOTAL .

TOTAL ASSEMBLY 108.06

D.C. ABOVE TOOLS ___ STANDS ___ SINGLES TOTAL .

D.P. ABOVE TOOLS 45 STANDS 1 SINGLES TOTAL 1709.97

TOTAL DRILL COLLARS & DRILL PIPE & TOOLS 1818.03

TOTAL DEPTH 1794.62

TOTAL DRILL PIPE ABOVE K.B. 23.41

REMARKS:

TEST SUCCESSFUL

PO SUB	2.13
CO SUB	.56
REC. #	..
SHUT-IN TOOL	5.15
SAMPLER	..
HMV	5.41
JARS	..
REC #	..
SAFETY JOINT	.89
PACKER	..
PACKER DEPTH	2.82
STUB ANCHOR	3.08
Perfs.	20.11
XOS	.52
Drill Pipe	57.09
XOS	.43
Rec. # 13781 & 13782	7.87
BULL NOSE	..
T.D.	1794.62 ft.

APPENDIX 6

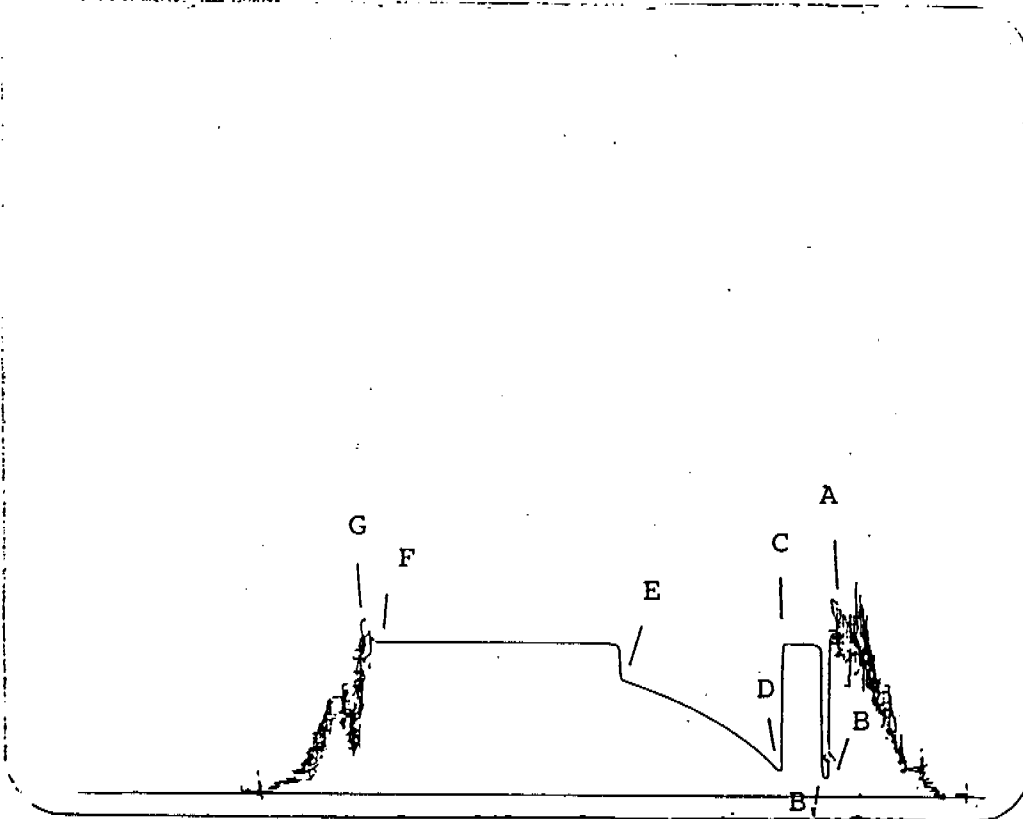
SHOW EVALUATION REPORT

BORROWDALE-2

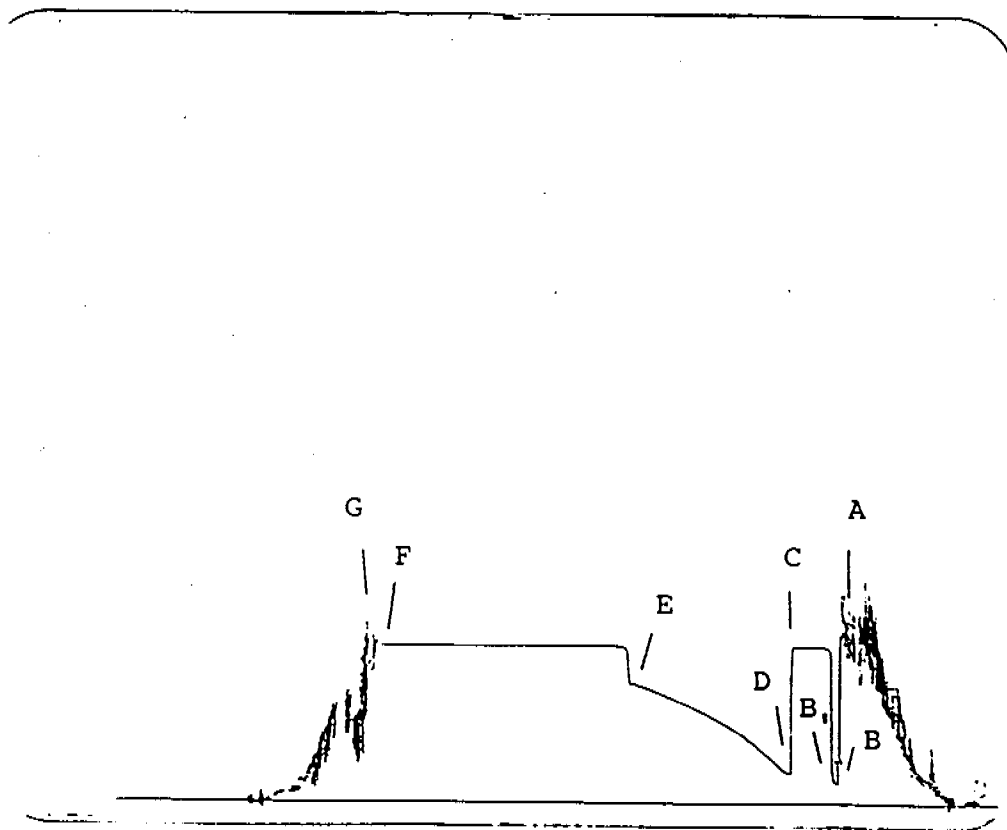
Well Name :Pacific Borrow Dale # 2
Location :McArthur Basin

Ticket #:1502
DST # :One

Recorder :13781
Depth :1788.06
Clock :24 hr.
A : 786.7
B : 81.7
B1 : 87.5
C : 744.2
D : 118.3
E : 559.8
F : 740.3
G : 773.2
D1 : 0.0
E1 : 0.0
F1 : 0.0



Recorder :13782
Depth :1788.06
Clock :24 hr.
A : 788.1
B : 90.4
B1 : 94.1
C : 741.6
D : 131.9
E : 558.5
F : 740.7
G : 774.2
D1 : 0.0
E1 : 0.0
F1 : 0.0



INTERVAL : 526.47 - 547.00FORMATION : BESSIE CREEK SANDSTONESHOW VALUE :

Poor	Fair	Good	V Good	Excellent
------	------	------	--------	-----------

SHOW DETAIL					
DEPTH	MIN/FT	GAS UNITS	DEPTH	MIN/FT	GAS UNITS

GAS READINGS (MUD)					GAS COMPOSITION (%)	
HOT WIRE UNITS	GAS IN AIR MIXTURE (ppm)					
	CHROMATOGRAPH					
	C ₁	C ₂	C ₃	1C ₄	NC ₅	
BACKGROUND	3					
MAXIMUM GAS	14					
% INCREASE						
REMARKS: SANDSTONE IMMEDIATELY BELOW DOLERITE. LIGHT OIL.						
STAIN, MOBILE, FAINT HC ODOUR, PALE BROWN						
FLUORESCING WHITISH BLUE						
FLUORESCENCE						
COLOUR	TYPE	% OF SAMPLE				
WHITISH BLUE	GOOD	20% to 70%				
BIT CONDITION						
Hrs						
MUD WEIGHT						
PERSON NOTIFIED						
CUT						
	COLOUR	SPEED				
NATURAL	PALE BLUE	IMMEDIATE				
CRUSHED	PALE BLUE	STREAMING				
ACIDIZED						

SAMPLE DESCRIPTION: SAMPLE TAKEN - QUARTZ SANDSTONE, MEDILM GRAINED, MODERATELY WELL SORTED WELL ROUNDED QUARTZ GRAINS

WELDED (60%): PARTIAL S₁O₂ CEMENT VISIBLE POROSITY

REMARKS: IS VERY VERY VARIABLE: 0-10%; AVERAGE? 4% AS THIN POROUS LAMINAE/LENSES AND AS FINE FRACTURES

SAMPLES ANALYSED FOR (SEALED)	POROSITY	PERMEABILITY	WATER SATURATION	OIL SATURATION	SEALED SAMPLES	LOGGING ENGINEER/GEOLOGIST
					527.40-527.44	542.09-542.13
					534.10-534.80	543.52-543.68
					536.60-536.76	544.72-544.81
					539.42-539.50	

APPENDIX 7

GEOCHEMICAL ANALYSES

BY GEARHART CORE DATA PTY LTD

BORROWDALE-2

C12 + BULK COMPOSITION AND ALKANE RATIOS OF OILS

Sample	Depth (m)	EOM (ppm)	C12 + Composition			Alkane Ratios				
			Sats %	Arom %	Res+Asph %	TMTD/Pr	Np/Pr	Pr/Ph	Pr/n-C17	Ph/n-C18
1369446	519.84	252	68.8	10.1	21.1	1.8	0.58	3.7	0.42	0.14
1369447		24	73.6	6.6	19.8	1.3	0.21	3.6	0.48	0.14
1369448	to	5.6	52.0	16.0	32.0	1.1	0.42	3.1	0.45	0.15
1369449		6.4	59.3	33.3	7.4	0.15	0.30	3.2	0.47	0.11
1369450	547.00	3.4	81.3	12.5	6.2	0.32	0.31	3.5	0.49	0.12

Sats = saturated hydrocarbons
 Arom = aromatic hydrocarbons
 Res = resins + polar compounds
 Asph = asphaltenes

TMTD = 2,6,10-trimethyltridecane
 np = norpristane
 Pr = pristane
 n-C17 = n-heptadecane
 n-C18 = n-octadecane

APPENDIX 8

WATER ANALYSES

BY AMDEL

BORROWDALE-2

DST 1 30 stands above tool

Sample ID. SAMPLE 1

Chemical Composition				Derived Data			
		mg/L	me/L				mg/L
Cations				Total Dissolved Solids			
Calcium	(Ca)	409.0	20.409	A. Based on E.C.			7841
Magnesium	(Mg)	115.0	9.465	B. Calculated (HCO3=CO3)			7770
Sodium	(Na)	2336.0	101.609				
Potassium	(K)	96.0	2.455				
Anions				Total Hardness			
Hydroxide	(OH)			Carbonate Hardness			386
Carbonate	(CO3)			Non-Carbonate Hardness			1108
Bi-Carbonate	(HCO3)	363.8	5.965	Total Alkalinity			386
Sulphate	(SO4)	5.2	0.108	(Each as CaCO3)			
Chloride	(Cl)	4627	130.330	Totals and Balance			
Nitrate	(NO3)	<0.1					
Other Analyses				Cations (me/L)	133.9	Diff=	2.46
				Anions (me/L)	136.4	Sum =	270.34
				ION BALANCE	(Diff*100/Sum) =		0.91%
				Sodium / Total Cation Ratio			75.9%
				Remarks			
Reaction - pH			6.8				
Conductivity (E.C)			12600				
(micro -S/cm at 25°C)							
Resistivity Ohm.M at 25°C			0.794				
				Note:	mg/L = Milligrams per litre		
					me/L = MilliEqvs.per litre		

DST 1 27 stands above tool

Sample ID. SAMPLE 2

Chemical Composition				Derived Data			
		mg/L	me/L				mg/L
Cations				Total Dissolved Solids			
Calcium	(Ca)	835.0	41.667	A. Based on E.C.			13207
Magnesium	(Mg)	235.0	19.342	B. Calculated (HCO3=CO3)			12112
Sodium	(Na)	3565.0	155.067				
Potassium	(K)	116.0	2.967				
Anions				Total Hardness			
Hydroxide	(OH)			Carbonate Hardness			466
Carbonate	(CO3)			Non-Carbonate Hardness			2586
Bi-Carbonate	(HCO3)	438.7	7.192	Total Alkalinity			466
Sulphate	(SO4)	5.0	0.104				
Chloride	(Cl)	7137	201.032				
Nitrate	(NO3)	<0.1					
				Totals and Balance			
				Cations (me/L)	219.0	Diff=	10.71
				Anions (me/L)	208.3	Sum =	427.37
Other Analyses				ION BALANCE (Diff*100/Sum) = 2.51%			
				Sodium / Total Cation Ratio 70.8%			
				Remarks			
				IMBALANCE UNKNOWN ALL RESULTS CHECKED AND VERIFIED.			
Reaction - pH				6.9			
Conductivity (E.C)				20000			
(micro -S/cm at 25°C)							
Resistivity Ohm.M at 25°C				0.500			
				Note: mg/L = Milligrams per litre, me/L = MilliEqvs. per litre			

DST 1 20 stands above tool

Sample ID. SAMPLE 3

Chemical Composition				Derived Data	
		mg/L	me/L		mg/L
Cations				Total Dissolved Solids	
Calcium	(Ca)	1695.0	84.581	A. Based on E.C.	26263
Magnesium	(Mg)	470.0	38.683	B. Calculated (HCO3=CO3)	23258
Sodium	(Na)	6366.0	276.903		
Potassium	(K)	179.0	4.578		
Anions				Total Hardness	
Hydroxide	(OH)			Carbonate Hardness	206
Carbonate	(CO3)			Non-Carbonate Hardness	5959
Bi-Carbonate	(HCO3)	194.3	3.185	Total Alkalinity	206
Sulphate	(SO4)	6.2	0.129	(Each as CaCO3)	
Chloride	(Cl)	14445	406.891	Totals and Balance	
Nitrate	(NO3)	<0.1		Cations (me/L)	404.7
				Anions (me/L)	410.2
				Diff=	5.46
				Sum =	814.95
Other Analyses				ION BALANCE (Diff*100/Sum) =	
					0.67%
				Sodium / Total Cation Ratio	
					68.4%
Remarks					
Reaction - pH					
			6.7		
Conductivity (E.C)					
			35500		
(micro -S/cm at 25°C)					
Resistivity Ohm.M at 25°C					
			0.282		
Note:				mg/L = Milligrams per litre	
				me/L = MilliEqivs. per litre	

DST 1 10 stands above tool

Sample ID. SAMPLE 4

Chemical Composition				Derived Data	
		mg/L	me/L		mg/L
Cations				Total Dissolved Solids	
Calcium	(Ca)	2116.0	105.589	A. Based on E.C.	33965
Magnesium	(Mg)	585.0	48.148	B. Calculated (HCO ₃ =CO ₃)	28717
Sodium	(Na)	7810.0	339.713		
Potassium	(K)	209.0	5.345		
Anions				Total Hardness	
Hydroxide	(OH)			Carbonate Hardness	7690
Carbonate	(CO ₃)			Non-Carbonate Hardness	338
Bi-Carbonate	(HCO ₃)	318.2	5.216	Total Alkalinity	7352
Sulphate	(SO ₄)	6.6	0.137	(Each as CaCO ₃)	338
Chloride	(Cl)	17832	502.296		
Nitrate	(NO ₃)	<0.1			
				Totals and Balance	
				Cations (me/L)	498.8
				Anions (me/L)	507.6
				Diff=	8.85
				Sum =	1006.44
Other Analyses				ION BALANCE (Diff*100/Sum) =	0.88%
				Sodium / Total Cation Ratio	68.1%
				Remarks	
Reaction - pH					
Conductivity (E.C)					
(micro -S/cm at 25°C)					
Resistivity Ohm.M at 25°C					

Note: mg/L = Milligrams per litre
me/L = MilliEqvs. per litre

DST 1 top test tool

Sample ID. SAMPLE 5

Chemical Composition				Derived Data	
		mg/L	me/L		mg/L
Cations				Total Dissolved Solids	
Calcium	(Ca)	2315.0	115.519	A. Based on E.C.	38061
Magnesium	(Mg)	658.0	54.156	B. Calculated (HCO ₃ =CO ₃)	31261
Sodium	(Na)	8425.0	366.464		
Potassium	(K)	225.0	5.754		
Anions				Total Hardness	
Hydroxide	(OH)			Carbonate Hardness	352
Carbonate	(CO ₃)			Non-Carbonate Hardness	8135
Bi-Carbonate	(HCO ₃)	331.8	5.440	Total Alkalinity	352
Sulphate	(SO ₄)	7.7	0.160	(Each as CaCO ₃)	
Chloride	(Cl)	19464	548.295	Totals and Balance	
Nitrate	(NO ₃)	<0.1		Cations (me/L)	541.9
				Anions (me/L)	553.9
				Diff=	12.00
				Sum =	1095.79
Other Analyses				ION BALANCE	(Diff*100/Sum) = 1.10%
				Sodium / Total Cation Ratio	67.6%
				Remarks	
Reaction - pH			7.1		
Conductivity (E.C)			47500		
(micro -S/cm at 25°C)					
Resistivity Ohm.M at 25°C			0.211		
				Note:	mg/L = Milligrams per litre
					me/L = MilliEqvs. per litre

NB. Stand = approximately 6 m

Interval = 519.84m to 547.00m