APPROVAL

FORM

Canada Oil and Gas Lands Administration | Administration du pétrole et du gaz des terres du Canada

D.A. #1394

Nova Scotia	☐	West Coast	☐	Exploratory	☒
Newfoundland	☐	Northern	☒	Development	☐
Gulf of St. Lawrence	☐	Hudson Bay	☐	Delineation	☐
				Service	☐

AUTHORITY TO DRILL A WELL

APPLICATION

This application is submitted with Section 82 of the Canada Oil and Gas Drilling Regulations. When approved under Section 83 of the Regulations, it is the requisite authority for the commencement of drilling operations.

Well Name in Full: Shell et al Arrowhead B-41

Operator: Shell Canada Limited — Drilling Program No.:

Contractor: Atco — Permit or Lease No.: EL 311

Drilling Rig or Unit: A8 — Estimated Well Cost: 2,500,000

Location-Unit: B — Section: 41 — Grid Area: 60° 40', 122° 45'

Coordinates: Lat.: 60° 30' 08.4931" — Long.: 122° 53 16.9292"

Area: Arrowhead, NWT Mainland — Field/Pool: Exploration

Elevation-RT/KB: 517.0 (Est) (ASL) — Ground ~~Sea Level~~: 512.38 m ASL ~~(SEA)~~

Approx. Spud Date: January 15, 1989 — Estimated Days on Location: 60

Anticipated Total Depth: 2950 m KB — Target Horizon(s): Cretaceous Basal Quartz, Devonian Slave Point, Hume/Presquile

UWI: 300B416040122450

EVALUATION PROGRAM

Ten-metre sample intervals:

Five-metre sample intervals: From surface to final total depth

Canned sample intervals: From surface casing to final total depth

Conventional cores at: 2-18.0 m cores (596-632 m), 1-18.0 m core (2750-2768 m)

Logs and Tests: Log Run 1 @ ± 650 m; BHCS-GR-C, DISFL, CNL-LDT, ML-MSFL
Log Run 2 @ ± 1050 m; BHCS-GR-C, DISFL. Log Run 3 @ ± 2950 m; BHCS-GR-C, DISFL, CNL-LDT-DAC, MS-MSFL, VSP. Tests contingent on Petrophysical Evaluation

CASING AND CEMENTING PROGRAM

O.D.	Weight:	Grade:		Setting Depth (mkB)	Cementing Program (Volumes):
760 mm	Conductor			15 m	
340 mm	81.1 + 90.8 kg/m	K55	New	300 m	40 m^3
245 mm	53.5 kg/m	K55	New	1050 m	40 m^3 (Est)
178 mm	34.2 + 38.7 kg/m	L80	New	2950 m	30 m^3 (Est)

B.O.P. Equipment: 0 - 300 m 760 mm Divertor
300 - 2950 m 34.5 MPa BOP stack including one annular preventer, two pipe rams, one blind ram,

Other Information: two pair of choke and kill lines

Signed: [signature] — Title: Manager - Drilling Division

Date: 88.12.28 — Company: Shell Canada Limited

APPROVAL

An approved copy of this notice is to be posted at each wellsite.

Signed: [signature]
Engineering Branch

Date: 89-01-12

File: 9211-S6-2-1

Department of Energy, Mines and Resources | Ministère de l'Énergie des Mines et des Ressources

Department of Indian Affairs and Northern Development | Ministère des Affaires indiennes et du Nord canadien

Canada

WELL

TERMINATION

RECORD

Canada Oil and Gas Lands Administration | Administration du pétrole et du gaz des terres du Canada

D.A. 1394

				Well Status	
Nova Scotia	☐	West Coast	☐	Suspended	☐
Newfoundland	☐	Northern	☒	Completed	☒
Gulf of St. Lawrence	☐	Hudson Bay	☐	Abandoned	☐

WELL TERMINATION RECORD

This record is submitted in triplicate in compliance with Section 184 of the Canada Oil and Gas Drilling Regulations.

WELL DATA

Well Name: SHELL ET AL ARROWHEAD B-41 Area: N.W.T.

Grid Area: 60-40-122-45 Field/Pool: UNDEFINED

Permit or Lease No.: EL 311 Final Coordinates: Lat.: 60°30'08.4931" Long: 122°53'16.9292"

Drilling Unit: ATCO RIG 48 Elevations-RT/KB: 520.0 m SF/GL: 512.48 m

Spud Date: 89/01/22 Rig Released: 89/03/17 Total Depth: 3080 m

CASING AND CEMENTING

O.D.:	Weight:	Grade:	Depth Set:	Cement and Additives:
339.7 mm	81.1	K55	311.0	53t"G"+1-0"w/1% $CaCl_2$
244.5 mm	53.6	K55	1056.0	51t"G"+1-0"w/.75% Hallad

PLUGGING PROGRAM

Approval of the following program was obtained by (person) KINGSLEY BLADES from (person) DAVE SCRATCH of the Canada Oil and Gas Lands Administration by means of TELEPHONE on MARCH 15 1989

Type of Plug:	Interval:	Felt:	Cement and Additives:
BRIDGE PLUG	3080.0-2975.0	NO	5.25t"G"40%Si,.75%CFR3,.2%HR1
"	2925.0-2850.0	NO	75m"G"40%Si,.75%CFR3,.2%HR12
"	2665.0-2565.0	YES @ 2553 m	5.1t"G"40%Si,.75%CFR3,.2%HR12
"	1850.0-1775.0	YES @ 1645 m	3.6t"G"40%Si,.5%CFR3,.2% HR12
"	1500.0-1425.0	YES@ 1418 m	3.9t"G"40%Si,.5%CFR3,.2% HR 4
BAKER N-1	1085.0-845.0	YES@ 854 m	12.6t"G",.5%CFR3,.1% HR 4
BRIDGE PLUG	785.0	NO	-
	785.0-755.0	NO	1.41 m "G"

Lost Circulation/Overpressure Zones: NIL

Equipment left on Seafloor (Describe): NIL

Provision for Re-entry (Describe and attach sketch): SEE ATTACHED DIAGRAMS.

Cores: Type: CONVENTIONAL Intervals: #1 597-615; #2 615.0-633.0 #3 2855.0-2869.8 #4 2869.8-2887.8

Other Downhole Completion/Suspension Equipment: 752 m INHIBITED H_2O & 3 m DIESEL ABOVE LAST PLUG.

CERTIFICATION

I certify on the basis of personal knowledge of operations undertaken at the above named well that the above information is accurate.

Signed: Doug Harrison P. Eng. Title: Section Supervisor - Field Operations Training

Name: Douglas M. Harrison Date: August 23, 1989

Acknowledged by: Engineering Branch

Date: 89-09-12

File: 9211-S5-2-1

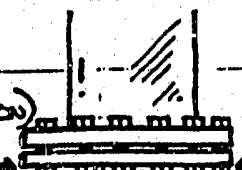
Department of Energy, Mines and Resources / Ministère de l'Énergie, des Mines et des Ressources

Department of Indian Affairs / Ministère des Affaires indiennes

Canada

SHELL ET AL ARROWHEAD B-41

SKETCH - COMPLETION (SUSPENSION)



K.B. = 520.0m

G.L. = 512.48m

3m DIESEL

752m INHIBITED H_2O

SURFACE CASING CEMENT
53 t "G" + 1-0" w/ 1% $CaCl_2$

HOLE SIZE = 444.5mm TO

CASING 339.7mm, 81.1/90.8 Kg/m
K55, SET @ 311.0m K.B.

INTERMEDIATE CEMENT
51 t "G" + 1-0" w/ .75% HALLAD

PLUG #7: 785m - 755m
1.41 m^3 "G"

PLUG #6: BAKER N-1, SET AT 785m

PLUG #5: 1085 - 845m
12.6 t "G"
.5% CFR-3
.1% HR-4

HOLE SIZE = 311.2mm TO
CASING 244.5mm, 53.6 Kg/m
K55, SET @ 1036.0m K.B.

PLUG #4: 1500 - 1425m
3.9 t "G" + 40% Si
.5% CFR-3
.2% HR-4

HOLE SIZE = 215.9mm TO

PLUG #3: 1850 - 1775m
5.6 t "G" + 40% Si
.5% CFR-3
.2% HR-4

PLUG #2: 2665 - 2565m
51 t "G" + 40% Si
.75% CFR-3
.2% HR-12

PLUG #1B: 2925 - 2850m
75m "G" + 40% Si
.75% CFR3
.2% HR-12

PLUG #1A: 3080.0 - 2975.0
5.75 t "G" + 40% Si
.75% CFR3
.2% HR-12

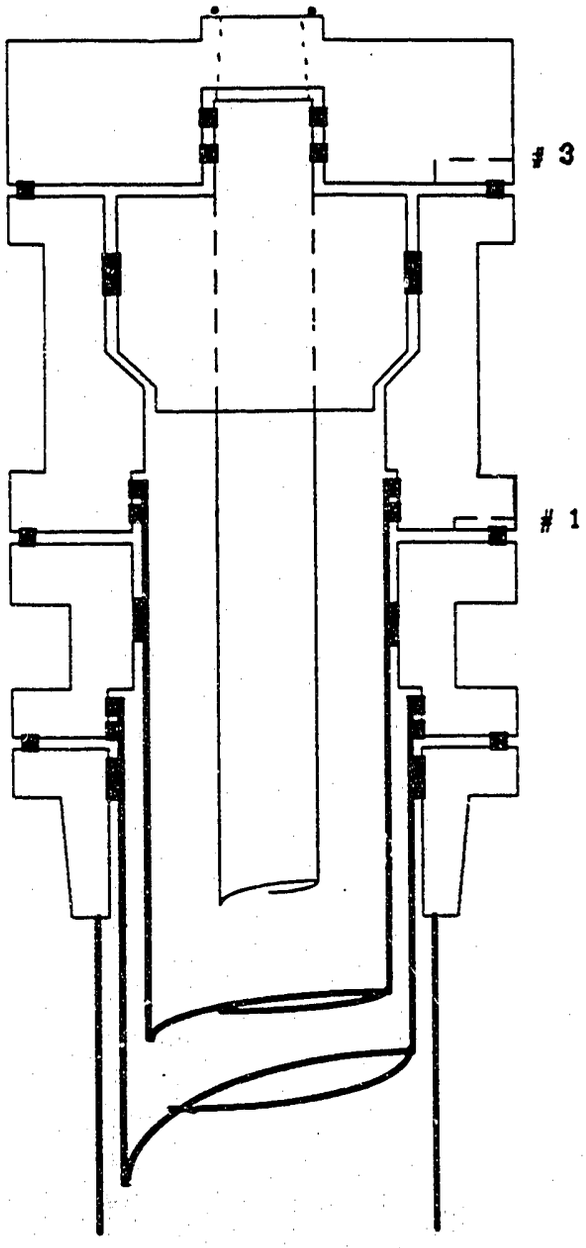
ATTACHMENT # 2

SHELL ARRROWHEAD B-41

WELL HEAD SCHEMATIC AND PRESSURE TESTING DETAILS

Pressure test between the tubing hanger extended neck and body seals to 35 MPa through test port # 3.

Test the christmas tree (all equipment above the adapter flange) to 69 MPa.



	Flange size (mm)	Pressure rating (MPA)	Studs
	65.1	69	L7
# 3	279	35	L7
# 1	346.1	35 MPa FLANGE RATING MAX PRESSURE TEST = 26 MPa.	L7

WELL

HISTORY

REPORT

WELL HISTORY REPORT

SHELL ET AL ARROWHEAD
B-41 B11-56-3-1

9211-56-2-1

OTTAWA COPY

~~(PARTIAL)~~

WELL HISTORY REPORT

FOR

SHELL ET AL ARROWHEAD B-41

by

J. A. Sutherland

CANADA OIL AND GAS LANDS ADMINISTRATION
ADMINISTRATION DU PÉTROLE ET DU GAZ DES TERRES DU CANADA
JUL 10 1989
ENGINEERING AND CONTROL BRANCH
TECHNIQUE ET DU CONTRÔLE

Shell Canada Limited - Drilling Division
June 1989

SHELL ET AL ARROWHEAD B-41

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SHELL ET AL ARROWHEAD B-41

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   - C. Lithology
   - D. Stratigraphic Column
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4. Well Evaluation
   - A. Downhole Logs
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   - D. Drillstem Testing
5. Appendices to Well History Report
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CANADA OIL AND GAS LANDS ADMINISTRATION
ADMINISTRATION DU PÉTROLE ET DU GAZ DES TERRES DU CANADA
FEB 1 1990
ENGINEERING AND CONTROL
TECHNIQUE ET DU CONTROLE

5yr Confidential was removed.

CANADA OIL AND GAS LANDS ADMINISTRATION
ADMINISTRATION DU PÉTROLE ET DU GAZ DES TERRES DU CANADA
FEB 7 1990
ENGINEERING AND CONTROL
TECHNIQUE ET DU CONTROLE

INTRODUCTION

Shell et al Arrowhead B-41 was an unsuccessful test of the Devonian Hume/Presquile formation. The Basal Quartz (622-653 m) was successfully tested (6 m gas payzone). The well has been left suspended with wellhead in place, all lower zones abandoned and the Bazal Quartz behind cemented casing.

The highlight of the drilling phase was a successful air drilling interval of 1056 - 2504 m at an average rate of penetration of 21.2 metres per hour before mudding-up for evaluation purposes. A total of 62 days were taken to drill, evaluate and suspend the well at a cost of $2,600,000.

This report covers the "General Data" and "Summary of Drilling Operations" sections of the Well History Report, and should be inserted into the full document when it is completed.

SHELL ET AL ARROWHEAD B-41

GENERAL WELL DATA

Well Location	60° 30′, 08.493" N 122° 53′, 16.929" W
Operator	Shell Canada Limited P.O. Box 100, Stn. 'M' Calgary, Alberta T2P 2H5
Contractor	Atco Drilling Suite #700 800 - 6 Avenue S.W. Calgary, Alberta T2P 3G3
Drilling Unit	Atco #48
Elevations	K.B. - 520.0 m G.L. - 512.4 m
Total Depth	3080.2 m drillers depth 3075.0 m loggers depth 3078.9 m true vertical depth
Spud Date	January 22, 1989, 06:00 Hours
Drilling Completed	March 17, 1989
Well Suspended	March 24, 1989
Rig Release	March 24, 1989
Well Status	Suspended

SHELL ET AL ARROWHEAD B-41

DRILLING SUMMARY

1.0 Hole Size and Depths

SIZE	INTERVAL
444.5 mm	0 - 311 m
311.2 mm	311 - 1056 m
215.9 mm	1056 - 3080 m

2.0 Casing and Cementing Record

- See Attachment 1

3.0 Drilling Fluid System

- See Attachment 2 for Mud Properties Summary

INTERVAL	FLUID SYSTEM	COMMENTS
0 - 311 m	Gel Caustic	No hole problems No lost circulation
311 - 1056 m	Gel Chemical	No hole problems, no lost circulation
1056 - 2505 m	Air	Sweet Gas to surface @ 1468 m - 2 m flare Mudded up @ 2504 m for evaluation purposes.
2505 - 3080 m	Gel Chemical	Minor sloughing low background gas high wellbore temp. No significant problems.

4.0 Formation Leak-Off Tests

DEPTH (m)	SHOE DEPTH (m)	WEIGHT kg/m^3	LEAK OFF kPa/m
320	311	1060	31.3 (No leak-off)

5.0 Time Distribution - see Attachment 3

6.0 Deviation Surveys - see Attachment 4

7.0 Abandonment Plugs

PLUG #	TYPE	DEPTH	CEMENT	COMMENT
1A	Cement	3080 - 2975 m	5.2t	Class 'G' + 40% silica flour + .75% CFR3 +.2% HR12 - No feel
1B	Cement	2925 - 2850 m	3.8t	Class G + 40% silica flour + .75% CFR3 +.2% HR12 - No feel
2	Cement	2665 - 2565 m	5.1t	Class G + 40% silica flour + .75% CFR3 +.2% HR12 - felt with Comtech @ 2553 m
3	Cement	1850 - 1775 m	3.6 t	Class G + 40% silica flour + .5% CFR3 +.2% HR4 - felt @ 1758 m w/Comtech
4	Cement	1500 - 1425	3.9 t	Class G + 40% silica flour + .5% CFR3 +.2% HR4 - felt @ 1418 m w/Comtech
5	Cement	1085 - 845	12.6t	Class G + .5% CFR3 +.1% HR4 - felt @ 849 m w/Comtech
6	Bridge Plug Baker N-1	785 -	-	Pressure tested to 7MPa. Dump bailed 30m of cement on top of plug 785 - 755 m.

8.0 Log Formation Tops - see Attachment 5

Attachment #1

SHELL ET AL ARROWHEAD B-41

SHELL ET AL ARROWHEAD B-41 CASING AND CEMENTING DETAILS							
SIZE (mm)	**WEIGHT (kg/m)**	**GRADE THREAD**	**SET (m)**	**DATE**	**CEMENT (tonnes)**	**CEMENT DETAILS**	**CEMENT TOP (m)**
760	-	-	15m		-	-	-
340	90.8 81.1	K55 - ST&C K55 - ST&C	235m 311m	Jan 25	53	Class 'G' + 1% CaCl2	5.0 m^3 of cement returns
244.5	53.5	K55 - ST&C	1056m	Feb 13	51	Class 'G' + 0.75% H322	12m

ATTACHMENT #2

NL BAROID MUD PROPERTY SUMMARY V2.2
COPYRIGHT 1987 NL BAROID/ NL INDUSTRIES
WATER BASE DRILLING MUD

April 13, 1989

OPERATOR: SHELL CANADA LT
WELL NAME: SHELL ARROWHEAD B-41
LOCATION:

REPORT			VISCOSITY			GELS			FILTRATION			FILTRATE ANALYSIS				SOLIDS ANALYSIS				ALT. ALKALINITY		
DATE	NO	DEPTH	WT	SEC	PV	YP	10"	10'10"	API	HTHP	DEGF CAKE	PF	MF	CL	CA	SAND	SOL%	H2O%	OIL%	MBT	HCO3	CO3	OH
1/20/89	1	0	1000	28	0	0	0	0						200	200						0	0	0
1/22/89	2	50	1045	37	5	3	1	3	15		1	0.4	0.86	240	88	.005	0.03	0.97	0	18	0	516	0
1/23/89	3	196	1110	64	23	11	5	22	8.4		2	0.2	0.7	320	0	.006	0.07	0.93	0	75	366	240	0
1/24/89	4	298	1110	76	25	13	7	21	8		2	0.1	0.47	320	20	.012	0.07	0.93	0	75	281	144	0
1/25/89	5	311	1085	55	22	6	3	19	8.8		2	0.1	0.42	320	40	.01	0.05	0.95	0	61	220	144	0
1/26/89	6	311	1085	55	22	6	3	19	8.8		2	0.1	0.42	320	40	.01	0.05	0.95	0	61	220	144	0
1/27/89	7	311	1085	55	22	6	3	19	8.8		2	0.1	0.42	320	40	.01	0.05	0.95	0	61	220	144	0
1/28/89	8	311	1085	55	22	6	3	19	8.8		2	0.1	0.42	320	40	.01	0.05	0.95	0	61	220	144	0
1/29/89	9	311	1085	55	22	6	3	19	8.8		2	0.1	0.42	320	40	.01	0.05	0.95	0	61	220	144	0
1/30/89	10	311	1060	42	10	3	1	7	11		1	0.4	0.76	380	0	TRC	0.04	0.96	0	53	73.2	420	0
1/31/89	11	311	1060	42	10	3	1	7	11		1	0.4	0.76	380	0	TRC	0.04	0.96	0	53	73.2	420	0
2/01/89	12	420	1075	38	9	2	1	6	9.8		1	0.6	1.3	680	0	.001	0.05	0.95	0	64	73.2	744	0
2/02/89	13	543	1110	53	20	7	3	12	8.2		1	0.3	0.8	460	0	.002	0.07	0.93	0	71	195	384	0
2/03/89	14	551	1110	65	27	13	3	8	7.5		1	0.2	0.68	450	0	.005	0.07	0.93	0	71	390	216	0
2/03/89	15	598	1090	50	16	6	3	7	7.2		1	0.2	0.78	300	20	.002	0.06	0.95	0	64	390	276	0
2/04/89	16	633	1080	50	13	7	4	8	8		1	0.3	0.85	175	20	0	0.05	0.95	0	50	427	300	0
2/05/89	17	667	1090	60	18	9	5	11	7.6		1	0.3	0.83	150	0	TR.	0.06	0.95	0	50	207	396	0
2/06/89	18	667	1085	67	18	10	5	14	7.8		1	0.2	0.85	150	0	TR.	0.05	0.95	0	53	549	240	0
2/07/89	19	667	1075	68	18	9	6	14						200	20	TR.	0.05	0.95	0	50	0	0	0
2/08/89	20	667	1090	75	21	11	7	18	7.3		1	0.4	0.7	220	40	TR.	0.06	0.95	0	50	0	420	0
09/89	21	765	1090	80	21	13	6	18	7.6		1	0.4	1	180	0	TR.	0.06	0.95	0	60	244	480	0
2/10/89	22	926	1110	71	21	13	6	18	8.4		2	0.5	1.1	180	0	.002	0.07	0.93	0	57	122	600	0
2/11/89	23	990	1090	68	19	12	5	16	8.4		2	0.5	0.95	180	0	TR.	0.06	0.95	0	53	61	540	0
2/12/89	24	1056	1125	76	21	13	6	15	8.2		1	0.3	0.75	150	0	.005	0.08	0.92	0	60	305	300	0
2/13/89	25	1056	1110	67	17	11	5	12	7.6		1	0.3	0.95	150	0	.005	0.07	0.93	0	53	427	360	0
2/14/89	26	1056	1110	51	14	6	3	11	9.2		1	0.2	0.7	125	0	.005	0.07	0.93	0	46	366	240	0
2/15/89	27	1056																			0	0	0
2/16/89	28																				0	0	0
2/17/89	29																				0	0	0
2/18/89	30																				0	0	0
2/19/89	31	1799	1080	44	12	6	2	5	9.8		1	0.3	0.74	580	0	.001	0.05	0.95		57	195	348	0
2/20/89	32	2015	1070	44	11	5	2	6	10		1	0.2	0.64	540	0	.001	0.04	0.96		53	342	216	0
2/21/89	33	2504	1065	49	15	6	4	8	9.6		1	0.4	0.95	540	0	.001	0.04	0.96		57	183	480	0
2/22/89	34	2505	1080	74	19	12	4	16	8.6		1	0.2	0.82	520	0	.002	0.05	0.95	0	50	464	264	0
2/23/89	35	2562	1080	58	20	9	4	11	8		1	0.2	0.65	540	0	.003	0.05	0.95	0	57	354	216	0
2/24/89	36	2673	1100	68	20	10	4	15	8.8		1	0.2	0.55	540	0	.005	0.05	0.95	0	64	305	180	0
2/25/[illegible]	37	2754	1120	65	22	13	4	13	7.6		1	0.2	0.72	540	0	.005	0.06	0.[illegible]	0	57	293	288	0
2/26/[illegible]	38	2775	1125	67	20	10	4	16	7.8		1	0.3	0.74	540	0	.005	0.07	0.93	0	57	220	336	0
2/27/89	39	2836	1105	64	23	12	3	16	7.6		1	0.2	0.7	540	0	.002	0.06	0.94	0	61	366	240	0
2/28/89	40	2857	1115	69	22	12	7	19	8.4		1	0.3	1.05	540	0	.002	0.06	0.94	0	57	549	360	0
3/01/89	41	2887	1135	69	22	13	10	21	8.4		1	0.4	1.2	960	0	.004	0.07	0.93	0	61	439	504	0
3/02/89	42	2903	1130	57	15	9	7	21	9.2		1	0.8	1.6	980	0	.003	0.07	0.93	0	61	0	960	0
3/03/89	43	2996	1110	69	21	10	10	23	9.6		1	0.5	1.17	920	0	.001	0.06	0.94	0	60	281	564	0
3/04/89	44	3026	1130	53	19	8	7	20	8.8		1	0.8	1.54	960	0	.002	0.07	0.93	0	57	0	900	14
3/05/89	45	3080	1125	75	25	15	9	25	8		1	0.6	1.13	960	0	.001	0.06	0.94	0	64	0	636	24
3/06/89	46	3080	1130	68	19	12	7	19	8		1	0.4	1	860	0	.001	0.07	0.93	0	64	268	468	0
07/89	47	3080	1130	68	19	12	7	19	8		1	0.4	1	860	0	.001	0.07	0.93	0	64	268	468	0
[illegible]/08/89	[illegible]	3080	1120	58	16	9	6	17	8.8		1	0.3	0.92	860	0	.001	0.06	0.94	0	57	439	336	0

ATTACHMENT #2

April 13, 1989 | OPERATOR | WELL NAME | LOCATION |

SHELL CANADA LT | SHELL ARROWHEAD | B-41

	REPORT			VISCOSITY			GELS			FILTRATION		FILTRATE ANALYSIS				SOLIDS ANALYSIS					ALT. ALKALINITY		
DATE	NO	DEPTH	WT	SEC	PV	YP	10'	10"	API	HTHP DEGF	CAKE	PF	MF	CL	CA	SAND	SOL%	H2O%	OIL%	MBT	HCO3	CO3	OH
3/09/89	49	3080	1120	65	23	14	6	16	8.6		1	0.5	1.1	650	0	.001	0.09	0.92	0	57	122	600	0
3/10/89	50	3080	1120	65	23	14	6	16	8.6		1	0.5	1.1	600	0	.001	0.09	0.92	0	57	122	600	0
3/11/89	51	3080	1125	62	23	15	5	12	7.6		1	0.7	1.35	450	0	.001	0.09	0.92	0	57	61	780	0
3/12/89	52	3080	1125	60	23	15	5	12	7.6		1	0.7	1.35	450	0	.001	0.09	0.92	0	57	61	780	0
3/13/89	53	3080	1125	68	28	14	6	13	7.2		1	0.7	1.5	450	0	.001	0.09	0.92	0	60	122	840	0
3/14/89	54	3080	1130	72	30	15	5	12	7.6		1	0.6	1.4	450	0	.001	0.09	0.92	0	57	244	720	0
3/15/89	55	3080	1135	73	27	13	6	10	8		1	0.4	1.1	400	0	.001	0.09	0.91	0	60	366	480	0
3/16/89	56	3080	1120	56	26	9	4	9	8.4		1	0.5	1.4	450	0	.001	0.08	0.92	0	53	488	600	0

TIME DISTRIBUTION: SHELL ET AL ARROWHEAD B-41

SHELL CANADA LTD.
RESOURCES DEVELOPMENT
DRILLING DIVISION
DRILLING ENGINEERING

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NU - NIPPLE UP TIME
CORE - CORING TIME
CL - CIRC. PRIOR LOG
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COMP - COMPLETION TIME (PROD. TESTING & WELL SUSPENSION)
WOO - WAIT ON ORDERS/EQUIP.
DST - DRILL STEM TESTING
FISH - FISHING TIME
LC - LOST CIRC.
ABDN - ABANDONING TIME

G. INFO.	DFS	RS	DT	ST	CST	TRIP	WT	CT	CMT	WOC	PT	NU	CORE	CL	LOG	REAM	MDT	COMP	WOO	DST	FISH	LC	ABDN	TOTAL HRS
ARROWHEAD B-41	1	0.25	13	1.25													2.25							16.75
60 30 N,122 53 W	2	0.5	19.75	1.75													2							24
89/03/24	3	0.5	16.25	1.75	1	3.5	0.75									0.25								24
ATCO	4				3	4.5	1.5	11.75	2	1.25														24
TD=3080 m	5									3		21												24
	6											24												24
	7										12	12												24
	8										5						7		12					24
	9					6.5					10.5						7							24
	10	4				11					1						6				2			24
	11	0.75	16.25	1							2						4							24
	12		10.5	1	1.25	4.25										6.5	0.5							24
	13	0.5	4.25	0.25	1.25	10.25	1						4			2.5								24
	14	0.75	2.25			10							9			2								24
	15	0.25	4.5	0.25	2	5									12									24
	16	0.25			3.75	9.25											0.5			10.25				24
	17				4	6														14				24
	18	0.25				11.5										9.75	2.5							24
	19	0.5	18.5	1												3	1							24
	20	0.25	21.25	0.75	0.25		1.5																	24
	21	0.25	12.5	1	1	3	2.25									4								24
	22	0.25	0.5		2.25	6									10	4	1							24
	23			0.5	2.5	8		13																24
	24							3.25	3.25			17.5												24
	25										9.5	6.5							3.5		4.5			24

ATTACHMENT #3

TIME DISTRIBUTION FOR SHELL ET AL ARROWHEAD

SHELL CANADA LTD.
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G. INFO.	DFS	RS	DT	ST	CST	TRIP	WT	CT	CMT	WOC	PT	NU	CORE	CL	LOG	REAM	MDT	COMP	WOO	DST	FISH	LC	ABDN	TOTAL HRS
	26	0.5	3.25		5	14.25															1			24
	27	0.25	11.5	1.75	2.75	7.75																		24
	28		17.75	4.75	1.5																			24
	29	1.5	11	2.25	0.75	7.75											0.75							24
	30	0.75	17.75	4															1.5					24
	31	0.25	14	5	0.75	2					1						1							24
	32	0.75			14	9.25																		24
	33	0.5	16.5	0.5												1.5	5							24
	34	0.5	22.5	1																				24
	35	0.5	22.25	1.25																				24
	36	0.5	4.5		1	10.25					7.75													24
	37	0.25	16.75	0.5		4										2.5								24
	38	1.5	2.5	0.25	1	12.75							4			2								24
	39	0.5			1.75	11.75							10											24
	40	0.5	5			14							3.5			1								24
	41	0.5	22	1.5																				24
	42	1	11.5	0.5		10.5										0.5								24
	43	0.5	16	1.5	2.75	3.25																		24
	44	0.25			2.75	10									7.25	3.75								24
	45					2.5									21.5									24
	46														24									24
	47	1			9.5	5.5									8									24
	48				1.5	7.75					14.75													24
	49				10	12.25					1.75													24
	50	1				16														7				24

ATTACHMENT #3

TIME DISTRIBUTION FOR SHELL ET AL ARROWHEAD

SHELL CANADA LTD.
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DRILLING DIVISION
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DST - DRILL STEM TESTING
FISH - FISHING TIME
LC - LOST CIRC.
ABDN - ABANDONING TIME

G. INFO.	DFS	RS	DT	ST	CST	TRIP	WT	CT	CMT	WOC	PT	NU	CORE	CL	LOG	REAM	MDT	COMP	WOO	DST	FISH	LC	ABDN	TOTAL HRS
	51	1			5.75	10.75										3.75				2.75				24
	52	0.25				14.75														9				24
	53	1.25			3	15.75										2				2				24
	54				4	6.75																	13.25	24
	55																	17						17
	56																	24						24
	57																	24						24
	58																	24						24
	59																	24						24
	60																	24						24
	61																	24						24
	62																	24						24
	63																	23						23
TOTAL HRS		24.75	354.25	35.25	90	308.25	7	28	5.25	4.25	65.25	81	30.5	0	82.75	49	40.5	208	17	45	7.5	0	13.25	1496.75
% TIME		1.65	23.67	2.36	6.01	20.59	0.47	1.87	0.35	0.28	4.36	5.41	2.04	0.00	5.53	3.27	2.71	13.90	1.14	3.01	0.50	0.00	0.89	100.00

ATTACHMENT #3

*** WELL BORE CALCULATIONS ***

** METHOD - MINIMUM CURVATURE **

WELL : ARROWHEAD B-41
KB : 520 M DEPTH : 3080 M DATE : 19 PROJECTION AT AZIMUTH : 315.000 DEG

MEASURED DEPTH M	DRIFT ANGLE DEG	DRIFT DIRECTION DEG	COURSE LENGTH M	T.V.D. M	T.V.D. SUB SEA M	LOSS M	M	RECTANGULAR COORDINATES N/S	M	E/W	DOGLEG SEVERITY	BUILD RATE DEG/30M	BIT WALK	PROJECTION M
20.0	0.00	0	20.0	20.0	500.0	0.0	0.00	N	0.00	E	0.00	0.00	0.00	0.0
38.0	1.00	0	18.0	38.0	482.0	0.0	0.16	N	0.00	E	1.67	1.67	0.00	0.1
58.0	0.50	0	20.0	58.0	462.0	0.0	0.42	N	0.00	E	0.75	-0.75	0.00	0.3
67.0	0.30	0	9.0	67.0	453.0	0.0	0.48	N	0.00	E	0.67	-0.67	0.00	0.3
86.0	0.20	0	19.0	86.0	434.0	0.0	0.56	N	0.00	E	0.16	-0.16	0.00	0.4
105.0	0.80	0	19.0	105.0	415.0	0.0	0.73	N	0.00	E	0.95	0.95	0.00	0.5
115.0	0.30	0	10.0	115.0	405.0	0.0	0.83	N	0.00	E	1.50	-1.50	0.00	0.6
135.0	0.30	0	20.0	135.0	385.0	0.0	0.92	N	0.00	E	0.00	0.00	0.00	0.7
145.0	0.30	0	10.0	145.0	375.0	0.0	0.98	N	0.00	E	0.00	0.00	0.00	0.7
163.0	0.30	0	18.0	163.0	357.0	0.0	1.08	N	0.00	E	0.00	0.00	0.00	0.8
191.0	0.80	0	28.0	191.0	329.0	0.0	1.35	N	0.00	E	0.54	0.54	0.00	1.0
205.0	0.50	0	14.0	205.0	315.0	0.0	1.51	N	0.00	E	0.64	-0.64	0.00	1.1
232.0	0.80	0	27.0	232.0	288.0	0.0	1.81	N	0.00	E	0.33	0.33	0.00	1.3
249.0	0.50	0	17.0	249.0	271.0	0.0	2.00	N	0.00	E	0.53	-0.53	0.00	1.4
267.0	0.50	0	18.0	267.0	253.0	0.0	2.16	N	0.00	E	0.00	0.00	0.00	1.5
285.0	0.50	0	18.0	285.0	235.0	0.0	2.32	N	0.00	E	0.00	0.00	0.00	1.6
311.0	1.00	0	26.0	311.0	209.0	0.0	2.66	N	0.00	E	0.58	0.58	0.00	1.9
357.0	0.30	346	46.0	357.0	163.0	0.0	3.18	N	-0.03	W	0.46	-0.46	225.65	2.3
417.0	0.00	29	60.0	417.0	103.0	0.0	3.33	N	-0.07	W	0.15	-0.15	-158.50	2.4
474.0	0.00	29	57.0	474.0	46.0	0.0	3.33	N	-0.07	W	0.00	0.00	0.00	2.4
540.0	0.80	255	66.0	540.0	-20.0	0.0	3.21	N	-0.51	W	0.36	0.36	102.73	2.6
590.0	0.80	0	50.0	590.0	-70.0	0.0	3.47	N	-0.85	W	0.76	0.00	-153.00	3.1
660.0	0.50	24	70.0	660.0	-140.0	0.0	4.24	N	-0.73	W	0.17	-0.13	10.29	3.5
711.0	0.80	49	51.0	711.0	-191.0	0.0	4.67	N	-0.37	W	0.24	0.18	14.71	3.6
760.0	0.30	54	49.0	760.0	-240.0	0.0	4.97	N	0.00	W	0.31	-0.31	3.06	3.5
817.0	0.00	0	57.0	817.0	-297.0	0.0	5.06	N	0.16	E	0.16	-0.16	-28.42	3.5
877.0	0.30	344	60.0	877.0	-357.0	0.0	5.21	N	0.07	E	0.15	0.15	172.00	3.6
940.0	1.30	64	63.0	940.0	-420.0	0.0	5.68	N	0.67	E	0.61	0.48	-133.33	3.5
995.0	1.00	57	55.0	995.0	-475.0	0.0	6.22	N	1.63	E	0.18	-0.16	-3.82	3.2
1043.0	0.80	83	48.0	1042.9	-522.9	0.1	6.49	N	2.32	E	0.28	-0.13	16.25	2.9
1120.0	0.80	53	77.0	1119.9	-599.9	0.1	6.88	N	3.28	E	0.16	0.00	-11.69	2.5
1189.0	1.00	105	69.0	1188.9	-668.9	0.1	7.01	N	4.25	E	0.35	0.09	22.61	2.0
1257.0	0.50	134	68.0	1256.9	-736.9	0.1	6.65	N	5.03	E	0.27	-0.22	12.79	1.1
1306.0	0.80	139	49.0	1305.9	-785.9	0.1	6.24	N	5.41	E	0.19	0.18	3.06	0.6
1363.0	0.50	137	57.0	1362.9	-842.9	0.1	5.76	N	5.84	E	0.16	-0.16	-1.05	-0.1
1427.0	0.50	189	64.0	1426.9	-906.9	0.1	5.28	N	5.99	E	0.21	0.00	24.37	-0.5
1494.0	0.50	187	67.0	1493.9	-973.9	0.1	4.70	N	5.91	E	0.01	0.00	-0.90	-0.9
1552.0	0.50	184	58.0	1551.9	-1031.9	0.1	4.20	N	5.86	E	0.01	0.00	-1.55	-1.2
1609.0	0.50	219	57.0	1608.9	-1088.9	0.1	3.76	N	5.69	E	0.16	0.00	18.42	-1.4
1661.0	0.50	336	52.0	1660.9	-1140.9	0.1	3.79	N	5.45	E	0.49	0.00	67.50	-1.2
1720.0	0.80	269	59.0	1719.9	-1199.9	0.1	4.02	N	4.94	E	0.39	0.15	-34.07	-0.6

MEASURED DEPTH M	DRIFT ANGLE DEG	DRIFT DIRECTION DEG	COURSE LENGTH M	T.V.D. M	T.V.D. SUB SEA M	LOSS M	M	RECTANGULAR COORDINATES N/S	M	E/W	DOGLEG SEVERITY	BUILD RATE DEG/30M	BIT WALK	PROJECTION M
1780.0	1.30	346	60.0	1779.9	-1259.9	0.1	4.67	N	4.35	E	0.68	0.25	38.50	0.2
1840.0	1.30	14	60.0	1839.9	-1319.9	0.1	5.99	N	4.35	E	0.31	0.00	-166.00	1.2
1901.0	1.30	261	61.0	1900.9	-1380.9	0.1	6.55	N	3.84	E	1.07	0.00	121.48	1.9
1961.0	1.30	274	60.0	1960.9	-1440.9	0.1	6.90	N	2.49	E	0.15	0.00	6.50	2.8
2015.0	1.30	339	54.0	2014.8	-1494.8	0.2	7.11	N	1.65	E	0.78	0.00	36.11	3.9
2076.0	1.30	249	61.0	2075.8	-1555.8	0.2	7.51	N	0.76	E	0.90	0.00	-44.26	4.8
2140.0	1.30	101	64.0	2139.8	-1619.8	0.2	7.11	N	0.80	E	1.17	0.00	-69.38	4.5
2200.0	1.50	356	60.0	2199.8	-1679.8	0.2	7.76	N	1.41	E	1.11	0.10	127.50	4.5

ATTACHMENT #4.

2260.0	[redacted]	341	60.0	2259.8	-1739.8	0.2	9.29	N	[redacted]10	E	0.20	0.00	-7.50	5.8
2320.0	[redacted]	266	60.0	2319.8	-1799.8	0.2	9.98	N	[redacted]16	E	0.86	-0.10	-37.50	6.9
2357.0	[redacted]	225	37.0	2356.8	-1836.8	0.2	9.54	N	-0.67	W	0.96	0.41	-33.24	7.2
2414.0	1.80	259	57.0	2413.7	-1893.7	0.3	8.74	N	-2.18	W	0.55	0.00	17.89	7.7
2525.0	2.00	241	111.0	2524.7	-2004.7	0.3	7.47	N	-5.58	W	0.17	0.05	-4.86	9.2
2573.0	2.30	271	48.0	2572.7	-2052.7	0.3	7.08	N	-7.28	W	0.72	0.19	18.75	10.2
2630.0	2.00	250	57.0	2629.6	-2109.6	0.4	6.76	N	-9.36	W	0.44	-0.16	-11.05	11.4
2687.0	2.50	230	57.0	2686.6	-2166.6	0.4	5.62	N	-11.24	W	0.49	0.26	-10.53	11.9
2748.0	2.30	250	61.0	2747.5	-2227.5	0.5	4.35	N	-13.41	W	0.42	-0.10	9.84	12.6
2802.0	1.80	316	54.0	2801.5	-2281.5	0.5	4.58	N	-15.02	W	1.26	-0.28	36.67	13.9
2847.0	1.60	302	45.0	2846.5	-2326.5	0.5	5.43	N	-16.04	W	0.31	-0.13	-9.33	15.2
2963.0	5.50	309	116.0	2962.2	-2442.2	0.8	9.78	N	-21.74	W	1.01	1.01	1.81	22.3
3080.0	5.80	350	117.0	3078.7	-2558.7	1.3	19.14	N	-27.13	W	1.02	0.08	10.51	32.7

HORIZONTAL DEVIATION AT 3080.0 M IS 33.2 M AT N 54 48W

ATTACHMENT #4.

Attachment #5

SHELL ET AL ARROWHEAD B-41

FORMATION		DEPTH (meters)
Cretaceous	Fort St. John (Kfj)	68
	Scatter Sand (Kst	454
	Bazal Quartz (Kbq)	610
Mississipian	Debolt (Md)	653
	Pekisko (Mp)	810
	Banff (Mb)	834
	Charles (Mc)	1349
Devonian	Kotcho (Dkc)	1367
	Tetcho (Dte)	1759
	Trout River (Dtr)	1805
	Kakisa (Kks)	1869
	Fort Simpson (Dfs)	1902
	Muskwa (Dmsk)	2531
	Slave Point (Dsp)	2552
	Watt Mountain (Dwt)	2648
	Hume/Prequile (Dh)	2751
	Manetoe Dolomite	2860
	Basal Clastics	3072
TOTAL DEPTH		**3080**

NOTE: Complete Composite Well Record will be submitted with full report.

SUMMARY

In January of 1989, Shell Canada Limited moved Atco Drilling rig number 48 to it's Arrowhead B-41 location at Lat. 60°30'08.4931" and Long. 122°53'16.9292." The well was spudded on January 22, 1989 at 06:00 Hrs.

Drilling was completed on March 7, 1989 at a total depth of 3080M. There were three (3) Drill stem tests performed prior to suspending the well on March 16, 1989.

The following casing strings were set:

339.7mm to 311.0m and 244.5mm to 1056.0m

The well was drilled with gel chemical mud from 0 meter to 1056 meters, which is intermediate casing point. We drilled out of the casing with air and continued to 2504 meters, before going back to gel chemical and drilling to a total depth of 3080 meters.

Four (4) conventional cores were cut at B-41:

#1: 597.0 - 615.0m, recovery: ~~18.25m~~ 18.0
#2: 615.0 - ~~633.0m~~, 633.25 recovery: ~~18.10m~~ 18.25
#3: 2855.0 - 2869.8m, recovery: 14.47m
#4: 2869.8 - 2887.8m, recovery: 18.0m

See Core Analysis R. TURNER

Three (3) logging jobs were performed with various logging services. Maximum deviation in the well was 5.8° at 3075m. Atco 48 was rig released on March 17, 1989.

COMPOSITE WELL RECORD

GEOLOGY

A. *DRILL CUTTINGS*

Internal

Cutting samples were collected every five (5) meters from 300m to 3080m.

Distribution

Five (5) sets of washed and dried samples in plastic vials were caught. Two (2) sets were prepared at the rig during drilling and stored by Shell Canada in Calgary.

The remaining three (3) sets were split from a 500gm bulk sample that was caught during drilling. These were prepared in town by Canadian Rock Surgery and forwarded to:

1. Texaco Canada Limited
   605 - 5th Avenue S.W.
   Calgary, Alberta
   Attn: Paul English
   One (1) set

2. Shell Geological Warehouse
   4510 - 8A St. N.E.
   Calgary, Alberta
   T2E 4J7
   Attn: Allan Karpovich
   Two (2) sets

B. *CORES*

Conventional Cores

Core #1:

Date: 89-02-04
Interval: 597.0 - 615.0m
Recovery: ~~18.25m~~ 18.0

See Core Analysis
R TURNER

Core #2:

Date: 89-02-04
Interval: 615.0 - ~~633.0~~m 633.25
Recovery: ~~18.10~~m 18.25

Core #3:

Date: 89-03-01
Interval: 2855.0 - 2869.8m
Recovery: 14.47m

Core #4:

Date: 89-03-02
Interval: 2869.8 - 2887.8
Recovery: 18.0m

Cores #1-4 are stored at:

Shell Geological Warehouse
4510 - 8A St. N.E. Bldg #2
Calgary, Alberta
T2E 4J7
Attn: Allan Karpovich

CORE DETAIL REPORT

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #:
GRND:
DATE: 89-02-04 TIME: 0930 EXAMINER: J.DICKIE/D.MARION,KP K.B.:
FORMATION: BASAL QTZ CORE NO.: 1 INTERVAL: 597.0 m TO 615.0 RECOVERY: 18.25 m CORE SIZE: 114.5mm

TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 16

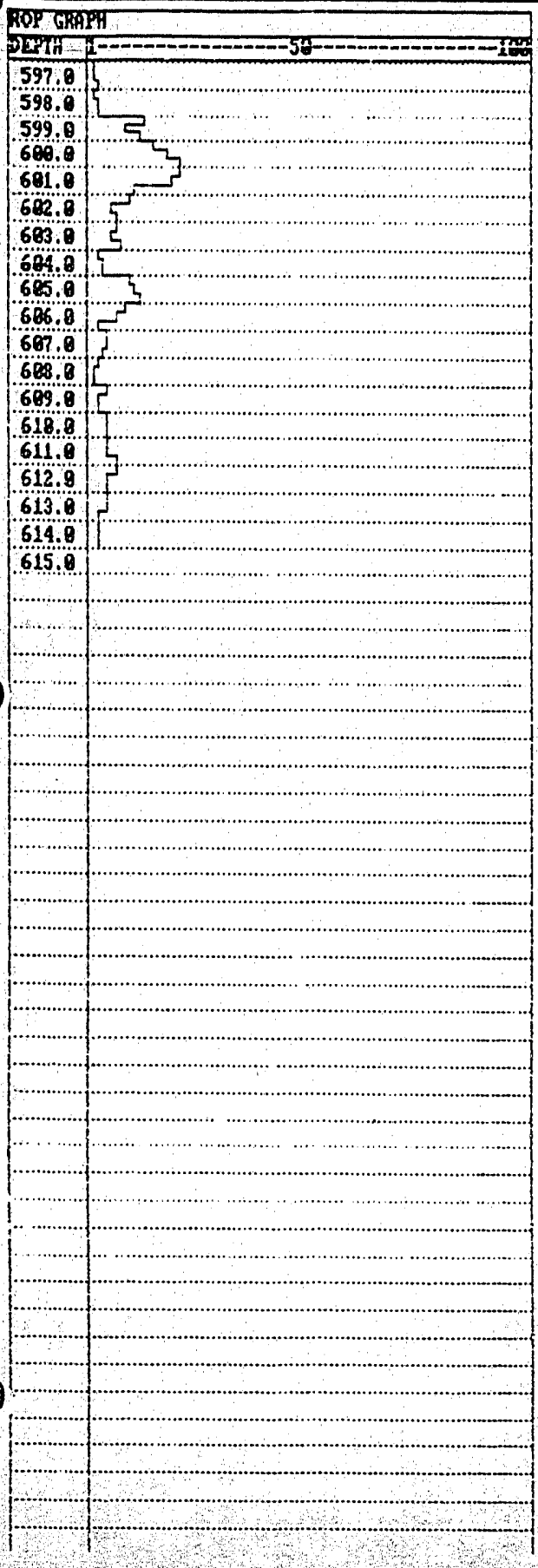
INTERVAL	ROCK DESCRIPTION	SHOWS %	SHOWS HC	FLUOR. %	FLUOR. INTENS.	CUT	CUT COLOR	CUT FLUOR.	CUT AVG.	STREAM REC	COMMENTS & FRAC/DIP STRUCT.
597.0-609.53	80% SHALE,DK.GRY-BLK,FISSILE,MINOR UP TO 1cm COAL PARTINGS,PLATY, CARBONACEOUS IN PART,MOSTLY SUB LITHOGRAPHIC,NON CALCAREOUS.	1	1	1	1	1BO	0	0	0.714	?	
	15% SILISTONE,MED.BRN-GRY,SILTY, SHARP CONTACTS BOTH TOP AND BOTTOM 10 cm BENTONITIC/ASH BEDDING @ 600m NO VISIBLE OIL STAINING.	0	0	0	0	0	0	0	0	D	
	K5% SANDSTONE,GRY,VERY SLIGHTLY CALC MOSTLY SIL,XF-VF,MWS,MVP,VERY TIGHT, CONS,AUG FLUOR-NO CUT? MINOR GRN SHALE STRINGRS WITH PYRITE	1	0	1	1	1Y	0	0	0.57	?	
609.53-610.15	SHALE,AS ABOVE W/DISTINCT CHERT BED AT 609.71m	0	0	0	0	0	0	0	0	D	
610.15-610.47	CHERT PEBBLE CONGLOMERATE, MATRIX SUPPORTED BY GLAUCONITIC PYRITIC SH, W/TRACES OF PYRITIC AND CARBONACEOUS MATERIAL,PEBBLES ARE BLK-LT.GRY	0	0	0	0	0	0	0	0	D	
610.47-610.85	SANDSTONE,GRY-TAN-BRN,VF,SIL,CONS, MWS,WAVY BEDDED,IN THE INTERVAL LIES A VERTICAL FRACTURE 2-20mm IN WIDTH AND UNFILLED WITH THE SAME MATERIAL AS THE ABOVE CONGLOMERATE INTERVAL. Btr POROSITY.	1	1	1	1	1y	0	0	.714	□	
610.85-614.90	SAND/SHALE SEQUENCE AS IN 1st INTERVAL,W/ THE EXCEPTION OF 1-3mm WHITE,SIL,VF,QTZ SANDSTONE,VERY TITE WAVY BEDDING THROUGHOUT,COAL PARTING S OCCASIONALLY.	1	0	1	1	1Y	0	0	0.57	□	
614.90-615.25	SHALE,VERY HIGHLY CARBONACEOUS, SILTY,SOFT,DK.GRY-BLK,FISSILE,SILTY NODULES.	0	0	0	0	0	0	0	0	D	

CORE DETAIL ROP GRAPH

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #:
GRND:
DATE: 89-02-04 TIME: 0930 EXAMINER: J.DICKIE/D.MARION,KP K.B.:
FORMATION: BASAL QTZ CORE NO.: 1 INTERVAL: 597.0 m TO 615.0 RECOVERY: 18.25 m CORE SIZE: 114.5mm

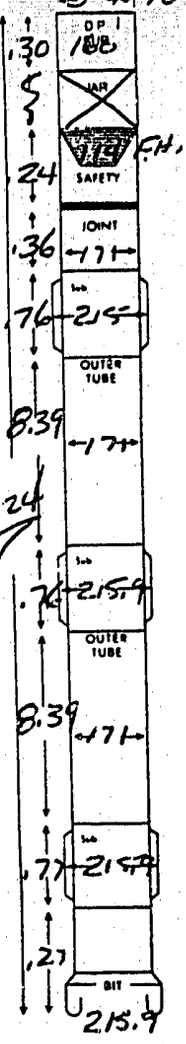
TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 16

ROP GRAPH



START (m)	DEPTH (m)	TIME	PENETRATION Actual	PENETRATION Lost	Mud Report & Remarks	WEIGHT daN	r/min	PUMP SIZE 152 x 235 Pressure kPa	PUMP SIZE Stroke mm
	597	19:55				2-3000	64	4500	98
0.25	0.2		56	1					
0.50	0.4		57	1					
0.6	0.6	598	59	2		4-5000	64		
1	1.8		20:00	1					
1.2	1.0		02	2					
1.50	1.2	599	04	2					
1.75	1.4		06	12					
2.00	1.8		24	8					
2.25	1.8	600	35	11		4-5000	64	4500	98
2.50	2.0		49	14					
2.75	2.2		21:06	17					
3.00	2.4	601	26	20					
3.25	2.6		46	24					
3.50	2.8		22:04	18					
3.75	3.0	602	14	10					
4.00	3.2		23	9					
4.25	3.4		28	5					
4.50	3.6	603	34	6		4-5000	64	4900	110
4.75	3.8		40	6					
5.00	4.0		45	5					
5.25	4.2	604	52	7					
5.50	4.4		54	2					
5.75	4.6		57	3					
6.00	4.8	605	23:00	3					
6.25	5.0		09	9					
6.50	5.2		19	10					
6.75	5.4	606	30	11		4-5000	64	4800	110
7.00	5.6		38	8					
7.25	5.8		44	6					
7.50	6.0	607	46	2					
7.75	6.2		50	4					
8.00	6.4		00:25	4	31 Conn & Time Correction				
8.25	6.0	608	28	3					
8.50	6.8		30	2					
8.75	7.0		31	1					
9.00	7.2	609	32	1		4-5000	68	4800	110
9.2	7.4		36	4					
9	7.6		38	2					
9..	7.8	610	40	2					
10.00	8.0		44	4					
10.25	8.2		48	4	Vis 53 wt 1090				
10.50	8.4	611	52	4					
10.75	8.6		56	4					
11.00	8.8		01:00	4					
11.25	9.0	612	06	6		4-5000	68	4800	110
11.50	9.2		12	6					
11.75	9.4		16	4					
12.00	9.6	613	20	4					
12.25	9.8		24	4					
12.50	10.0		28	4					
12.75	10.2	614	30	2					
13.00	10.4		32	2					
13.25	10.6		36	2					
13.50	10.8	615	38	2					
13.75	11.0								
14.00	11.2								
14.25	11.4								
14.50	11.6								
14.75	11.8								
15.00	12.0								
15.25	12.2								
15.50	12.4								
15.75	12.6								
16.00	12.8								
16.25	13.0								
16.50	13.2								
16.75	13.4								
17.00	13.6								
17.25	13.8								
17.50	14.0								
17.75	14.2								
18	14.4								
18	14.6								
	14.8								
	15.0								
	15.2								
	15.4								
	15.6								
	15.8								
	16.0								
	16.2								
	16.4								
	16.6								
	16.8								
	17.0								
	17.2								
	17.4								
	17.6								
	17.8								
	18.0								
	18.2								

* Delete the column which doesn't apply.



CORING LOG

FROM

EASTMAN CHRISTENSEN

16230 - 112 Avenue
Edmonton, Alberta, Canada T5M 2W1
Phone: (403) 451-0120/Telex 037-3502

CALGARY (403) 264-7722
GRANDE PRAIRIE (403) 532-2107
ST. JOHN'S, NFLD. (709) 726-1020
DARTMOUTH, N.S (902) 465-5686

Date FEB 3/89 Service Engineer LOGAN GARDIPEE
Company SHELL CANADA Contractor ATCO # 48
Well Name/No. SHELL ET AL ARROWHEAD B-41
Field ARROWHEAD Hole Size (mm) 215.9
Diamond Bit Size (mm) 215.9 x 102 Bit No. 061422
Diamond Bit Type RC 476 Core Barrel Size (mm) 171 x 102 x 18m
Length (m) 20.24 No. C-28 Jar No. STRING-GRIFF.
Core No. ONE. Depth: From 597.0m To 615.0m
Total Metres Cored 18.0m Recovered 18.0m
Hours 5:11 Formation Cored BASAL QUARTZ
Description SHALE & SILTY SAND
Time Reaming To Bottom CIRC. 1/4 HR.
Mud Wt. (kg/m³) 1090 r/min. 64
Mud Flowrate (m³/min.) 1.4
Bit Condition: Before 100 % After 98 %

331

(White) CUSTOMER COPY (Yellow) EDMONTON COPY (Pink) DISTRICT COPY

CORE DETAIL REPORT

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #:

DATE: 89-02-04 TIME: 0930 GRND:

FORMATION: BASAL QTZ CORE NO.: 1 INTERVAL: 597.0 m TO 615.0 EXAMINER: J.DICKIE/D.MARION,KP K.B.:

RECOVERY: 18.25 m CORE SIZE: 114.5mm

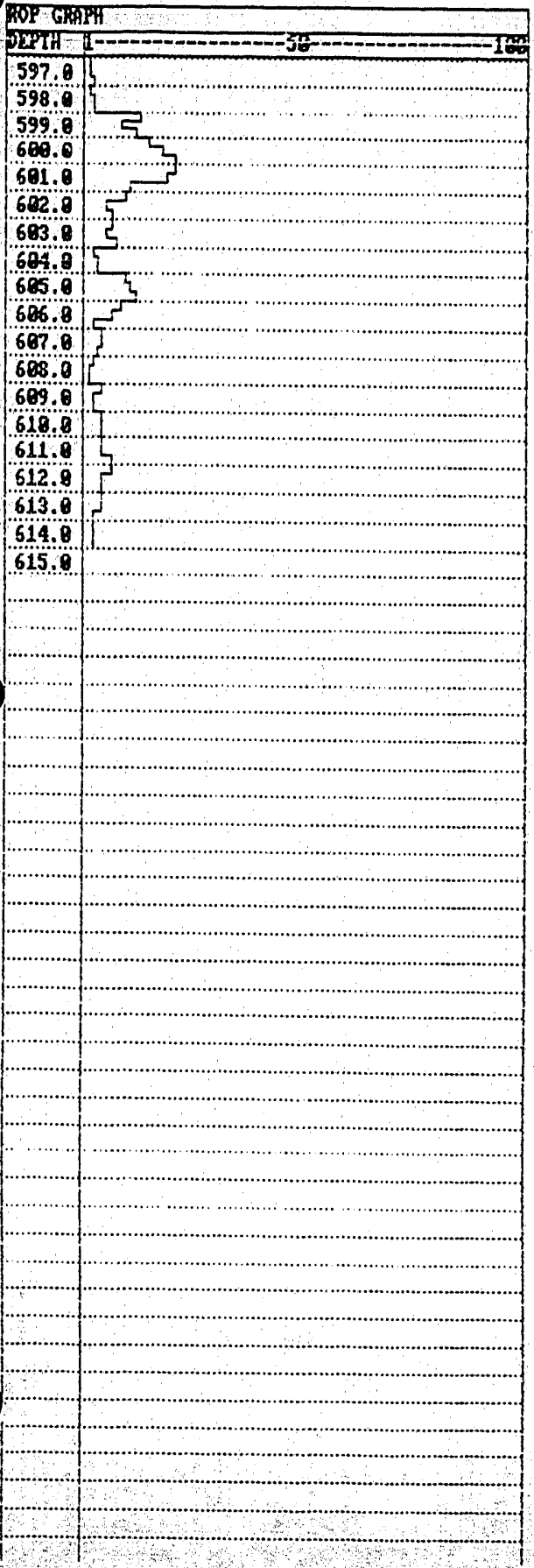
TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 16

INTERVAL	ROCK DESCRIPTION	SHOWS %	SHOWS HC COLOR	FLUOR. %	FLUOR. INTENSITY	CUT COLOUR	CUT INTENSITY	CUT RESIDUE	CUT RES.	COMMENTS & FRAC/DIP STRUCT.
597.0-609.53	80% SHALE, DK.GRY-BLK, FISSILE, MINOR UP TO 1cm COAL PARTINGS, PLATY, CARBONACEOUS IN PART, MOSTLY SUB LITHOGRAPHIC, NON CALCAREOUS.	1	1	1	1	1BO	0	0	0.714	?
	15% SILTSTONE, MED.BRN-GRY, SILTY, SHARP CONTACTS BOTH TOP AND BOTTOM 10 cm BENTONITIC/ASH BEDDING @ 600m NO VISIBLE OIL STAINING.	0	0	0	0	0	0	0	0	D
	5% SANDSTONE, GRY, VERY SLIGHTLY CALC MOSTLY SIL, XF-VF, MAS, NUP, VERY TIGHT, CONS, AVG FLUOR-NO CUT?	1	0	1	1	1Y	0	0	0.57	?
	MINOR GRN SHALE STRINGRS WITH PYRITE									
609.53-610.15	SHALE, AS ABOVE W/DISTINCT CHERT BED AT 609.71m	0	0	0	0	0	0	0	0	D
610.15-610.47	CHERT PEBBLE CONGLOMERATE, MATRIX SUPPORTED BY GLAUCONITIC PYRITIC SH, W/TRACES OF PYRITIC AND CARBONACEOUS MATERIAL, PEBBLES ARE BLK-LT.GRY	0	0	0	0	0	0	0	0	D
610.47-610.85	SANDSTONE, GRY-TAN-BRN, VF, SIL, CONS, MAS, WAVY BEDDED, IN THE INTERVAL LIES A VERTICAL FRACTURE 2-20mm IN WIDTH AND UNFILLED WITH THE SAME MATERIAL AS THE ABOVE CONGLOMERATE INTERVAL. Btr POROSITY.	1	1	1	1	1y	0	0	.714	□
610.85-614.90	SAND/SHALE SEQUENCE AS IN 1st INTERVAL, W/ THE EXCEPTION OF 1-3mm WHITE, SIL, VF, QTZ SANDSTONE, VERY TITE WAVY BEDDING THROUGHOUT, COAL PARTING S OCCASIONALLY.	1	0	1	1	1Y	0	0	0.57	□
614.90-615.25	SHALE, VERY HIGHLY CARBONACEOUS, SILTY, SOFT, DK.GRY-BLK, FISSILE, SILTY NODULES.	0	0	0	0	0	0	0	0	D

CORE DETAIL ROP GRAPH

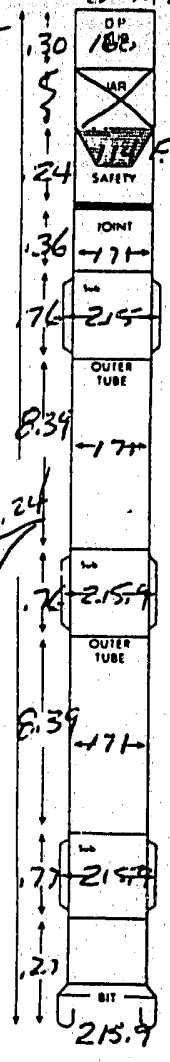
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TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 16



START (m)	DEPTH (m)	TIME	MIN / METR. Actual	MIN / METR. Lost	Mud Report & Remarks	WEIGHT daN	r/min	PUMP SIZE 15 x 235 Pressure kPa	PUMP SIZE 15 x 235 Stroke mm
	597	19:55							
0.25 0.2		56	1			2-3000	64	4500	98
0.50 0.4		57	1						
0.75 0.6	598	54	2			4-5000	64		
1 3.8		20:00	1						
1.25 1.0		02	2						
1.50 1.2	599	04	2						
1.75 1.4		06	12						
2.00 1.6		24	8						
2.25 1.8	600	32	11			4-5000	64	4500	98
2.50 2.0		49	14						
2.75 2.2		21:06	17						
3.00 2.4	601	26	20						
3.25 2.6		96	24						
3.50 2.8		22:04	18						
3.75 3.0	602	14	10						
4.00 3.2		23	9						
4.25 3.4		28	5						
4.50 3.6	603	34	6			4-5000	64	4800	110
4.75 3.8		40	6						
5.00 4.0		45	5						
5.25 4.2	604	52	7						
5.50 4.4		54	2						
5.75 4.6		57	3						
6.00 4.8	605	23:00	3						
6.25 5.0		04	4						
6.50 5.2		14	10						
6.75 5.4	606	30	11			4-5000	64	4800	110
7.00 5.6		38	8						
7.25 5.8		44	6						
7.50 6.0	607	46	2						
7.75 6.2		50	4						
8.00 6.4		00:25	4	31	Count & Time Correction				
8.25 6.6	608	28	3						
8.50 6.8		30	2						
8.75 7.0		31	1						
9.00 7.2	609	32	1			4-5000	68	4800	110
9.25 7.4		36	4						
9.50 7.6		38	2						
9.75 7.8	610	40	2						
10.00 8.0		44	4						
10.25 8.2		48	4		Vis 53 wt 1090				
10.50 8.4	611	52	4						
10.75 8.6		56	4						
11.00 8.8		01:00	4						
11.25 9.0	612	06	6			4-5000	68	4800	110
11.50 9.2		12	6						
11.75 9.4		16	4						
12.00 9.6	613	20	4						
12.25 9.8		24	4						
12.50 10.0		28	4						
12.75 10.2	614	30	2						
13.00 10.4		32	2						
13.25 10.6		36	2						
13.50 10.8	615	38	2						
13.75 11.0									
14.00 11.2									
14.25 11.4									
14.50 11.6									
14.75 11.8									
15.00 12.0									
15.25 12.2									
15.50 12.4									
15.75 12.6									
16.00 12.8									
16.25 13.0									
16.50 13.2									
16.75 13.4									
17.00 13.6									
17.25 13.8									
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17.75 14.2									
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14.8									
15.0									
15.2									
15.4									
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16.4									
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17.0									
17.2									
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17.8									
18.0									
18.2									

* Delete the column which doesn't apply.



CORING LOG

FROM

EASTMAN CHRISTENSEN

16230 - 112 Avenue
Edmonton, Alberta, Canada T5M 2W1
Phone: (403) 451-0120/Telex 037-3502

CALGARY (403) 264-7222
GRANDE PRAIRIE (403) 532-2107
ST. JOHN'S, NFLD (709) 726-1020
DARTMOUTH, N.S (902) 465-5686

Date FEB 3/87 Service Engineer LOGAN GARDIPEE

Company SHELL CANADA Contractor ATCO # 48

Well Name/No. SHELL ET AL ARROWHEAD B-41

Field ARROWHEAD Hole Size (mm) 215.9

Diamond Bit Size (mm) 215.9 x 102 Bit No. 061422

Diamond Bit Type RC 476 Core Barrel Size (mm) 171 x 102 x 18m

Length (m) 20.24 No. C-28 Jar No. STRING-GRIFF

Core No. ONE. Depth: From 597.0m To 615.0m

Total Metres Cored 18.0m Recovered 18.0m

Hours 5:11 Formation Cored BASAL QUARTZ

Description SHALE & SILTY SAND

Time Reaming To Bottom CIRC. 1/4 HR.

Mud Wt. (kg/m³) 1090 r/min. @ 64

Mud Flowrate (m³/min.) 1.4

Bit Condition: Before 100 % After 98 %

331

(White) CUSTOMER COPY (Yellow) EDMONTON COPY (Pink) DISTRICT COPY

CORE DETAIL REPORT

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #:

DATE: 89-02-04 TIME: 0930 EXAMINER: J.DICKIE/D.MARION,KP GRND: K.B.:

FORMATION: BASAL QTZ CORE NO.: 1 INTERVAL: 597.0 m TO 615.0 RECOVERY: 18.25 m CORE SIZE: 114.3mm

TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 16

INTERVAL	ROCK DESCRIPTION	SHOWS %	SHOWS WC ODOR	FLUOR. %	FLUOR. INTENSITY	CUT COLOR	CUT FLUOR	CUT RES.	CUT MEASURED DEPTH	POROSITY REC	COMMENTS & FRAC/DIP STRUCT.
597.0-609.53	80% SHALE, DK.GRY-BLK, FISSILE, MINOR UP TO 1cm COAL PARTINGS, PLATY, CARBONACEOUS IN PART, MOSTLY SUB LITHOGRAPHIC, NON CALCAREOUS.	1	1	1	1	1BO	0	0	0.714	P	
	15% SILTSTONE, MED.BRN-GRY, SILTY, SHARP CONTACTS BOTH TOP AND BOTTOM 10 cm BENTONITIC/ASH BEDDING @ 600m NO VISIBLE OIL STAINING.	0	0	0	0	0	0	0	0	D	
	5% SANDSTONE, GRY, VERY SLIGHTLY CALC MOSTLY SIL, XF-VF, MAS, NUP, VERY TIGHT, CONS, AUG FLUOR-NO CUT?	1	0	1	1	1Y	0	0	0.57	P	
	MINOR GRN SHALE STRINGRS WITH PYRITE										
609.53-618.15	SHALE, AS ABOVE W/DISTINCT CHERT BED AT 609.71m	0	0	0	0	0	0	0	0	D	
618.15-618.47	CHERT PEBBLE CONGLOMERATE, MATRIX SUPPORTED BY GLAUCONITIC PYRITIC SH, W/TRACES OF PYRITIC AND CARBONACEOUS MATERIAL, PEBBLES ARE BLK-LT.GRY	0	0	0	0	0	0	0	0	D	
618.47-618.85	SANDSTONE, GRY-TAN-BRN, VF, SIL, CONS, MAS, WAVY BEDDED, IN THE INTERVAL LIES A VERTICAL FRACTURE 2-20mm IN WIDTH AND UNFILLED WITH THE SAME MATERIAL AS THE ABOVE CONGLOMERATE INTERVAL. Btr POROSITY.	1	1	1	1	1Y	0	0	.714	□	
618.85-614.98	SAND/SHALE SEQUENCE AS IN 1st INTERVAL, W/ THE EXCEPTION OF 1-3mm WHITE, SIL, VF, QTZ SANDSTONE, VERY TITE WAVY BEDDING THROUGHOUT, COAL PARTING S OCCASIONALLY.	1	0	1	1	1Y	0	0	0.57	□	
614.98-615.25	SHALE, VERY HIGHLY CARBONACEOUS, SILTY, SOFT, DK.GRY-BLK, FISSILE, SILTY NODULES.	0	0	0	0	0	0	0	0	D	

CORE DEPTH ROP GRAPH

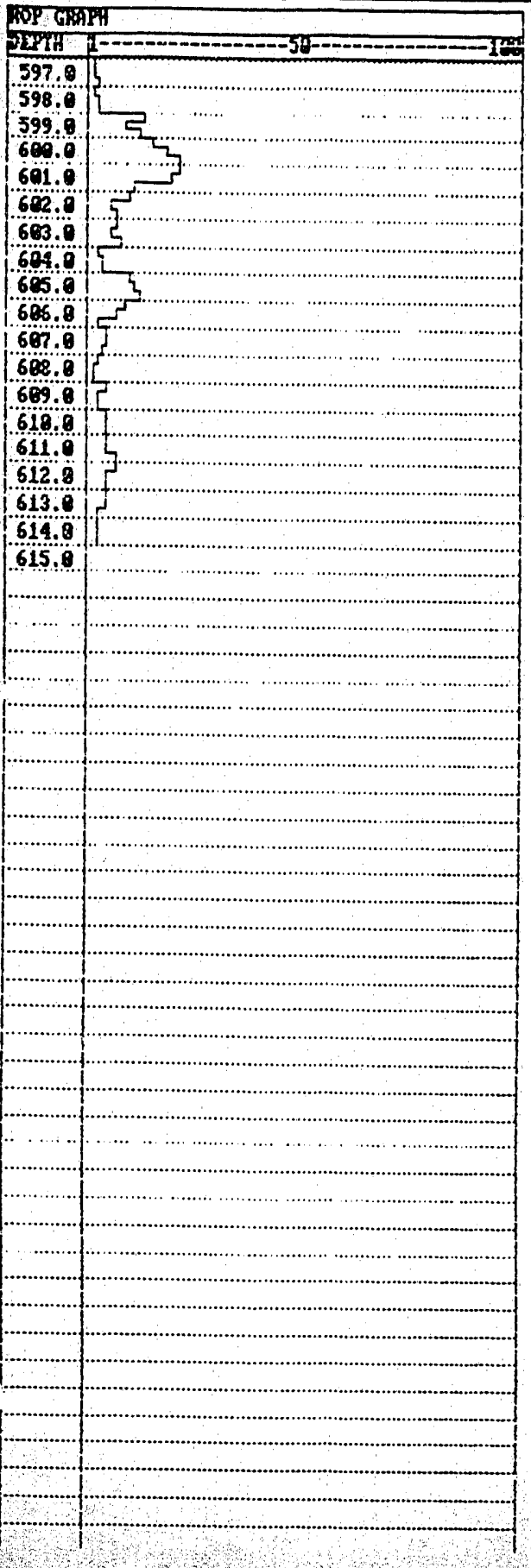
WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #:

DATE: 89-02-04 TIME: 0930 GRND:

FORMATION: BASAL QTZ CORE NO.: 1 INTERVAL: 597.0 m TO 615.0 EXAMINER: J.DICKIE/D.MARION.XP K.B.:

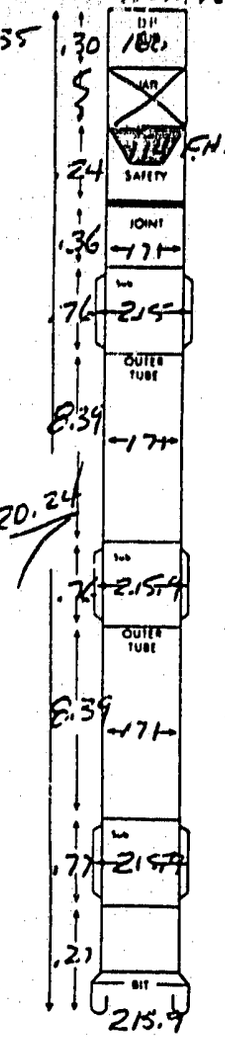
RECOVERY: 18.25 m CORE SIZE: 114.5mm

TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 16



START (m)	DEPTH (m)	TIME	MIN/METER Actual	MIN/METER Last	Mud Report & Remarks	WEIGHT daN	r/min	PUMP SIZE 5½ x 2.35 Pressure kPa	PUMP SIZE 5½ x 2.35 Stroke mm
0.25	0.2	597	19:55						
0.45	0.4		56	1					
	0.6		57	1		2:3000	64	4500	96
	0.8	598	58	1		4:5000	64		
	1.0		59	1					
1.20			20:00	1					
1.50	1.2	599	02	2					
1.75	1.4		04	2					
2.00	1.6		06	12					
2.25	1.8	600	24	8					
2.50	2.0		35	11		4:5000	64	4500	98
2.75	2.2		49	14					
			21:07	17					
3.00	2.4	601	26	20					
3.25	2.6		46	20					
3.50	2.8		22:04	18					
3.75	3.0	602	14	10					
4.00	3.2		23	9					
4.25	3.4		28	5					
4.50	3.6	603	34	6		4:5000	64	4800	110
4.75	3.8		40	6					
5.00	4.0		45	5					
5.25	4.2	604	52	7					
5.50	4.4		54	2					
5.75	4.6		57	3					
6.00	4.8	605	23:00	3					
6.25	5.0		09	9					
6.50	5.2		19	10					
6.75	5.4	606	30	11		4:5000	64	4800	110
7.00	5.6		38	8					
7.25	5.8		44	6					
7.50	6.0	607	46	2					
7.75	6.2		50	4					
8.00	6.4		00:20	4	31	Cent. & Time Correction			
8.25	6.6	608	28	3					
8.50	6.8		30	2					
8.75	7.0		31	1					
9.00	7.2	609	37	1		4:5000	68	4800	110
9.25	7.4		36	4					
9.50	7.6		38	2					
9.75	7.8	610	40	2					
10.00	8.0		44	4					
10.25	8.2		48	4					
10.50	8.4	611	52	4		Vis 53 WT 1090			
10.75	8.6		56	4					
11.00	8.8		01:00	4					
11.25	9.0	612	06	6		4:5000	68	4800	110
11.50	9.2		12	6					
11.75	9.4		16	4					
12.00	9.6	613	20	4					
12.25	9.8		24	4					
12.50	10.0		28	4					
12.75	10.2	614	30	2					
13.00	10.4		32	2					
13.25	10.6		36	2					
13.50	10.8	615	38	2					
13.75	11.0								
14.00	11.2								
14.25	11.4								
14.50	11.6								
14.75	11.8								
15.00	12.0								
15.25	12.2								
15.50	12.4								
15.75	12.6								
16.00	12.8								
16.25	13.0								
16.50	13.2								
16.75	13.4								
17.00	13.6								
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	17.8								
	18.0								
	18.2								

* Delete the column which doesn't apply



CORING LOG

FROM

EASTMAN CHRISTENSEN

16230 - 112 Avenue
Edmonton, Alberta, Canada T5M 2W1
Phone: (403) 451-0120/Telex 037-3502

CALGARY	(403) 264-7222
GRANDE PRAIRIE	(403) 532-2107
ST. JOHN'S, NFLD	(709) 726-1020
DARTMOUTH, N.S.	(902) 465-5686

Date FEB 3/89 Service Engineer LOGAN GARDIPEE

Company SHELL CANADA Contractor ATCO # 48

Well Name/No. SHELL ET AL ARROWHEAD B-41

Field ARROWHEAD Hole Size (mm) 215.9

Diamond Bit Size (mm) 215.9 x 102 Bit No. 061422

Diamond Bit Type RC 476 Core Barrel Size (mm) 171 x 102 x 18m

Length (m) 20.24 No. C-28 Jar No. STRING-GRIFF

Core No. ONE. Depth: From 597.0m To 615.0m

Total Metres Cored 18.0m Recovered 18.0m

Hours 5.11 Formation Cored BASAL QUARTZ

Description SHALE & SILTY SAND

Time Reaming To Bottom CIRC. 1/4 HR.

Mud Wt. (kg/m³) 1090 r/min. @ 64

Mud Flowrate (m³/min.) 1.4

Bit Condition: Before 100 % After 98 %

(White) CUSTOMER COPY (Yellow) EDMONTON COPY (Pink) DISTRICT COPY

CORE DESCRIPTION

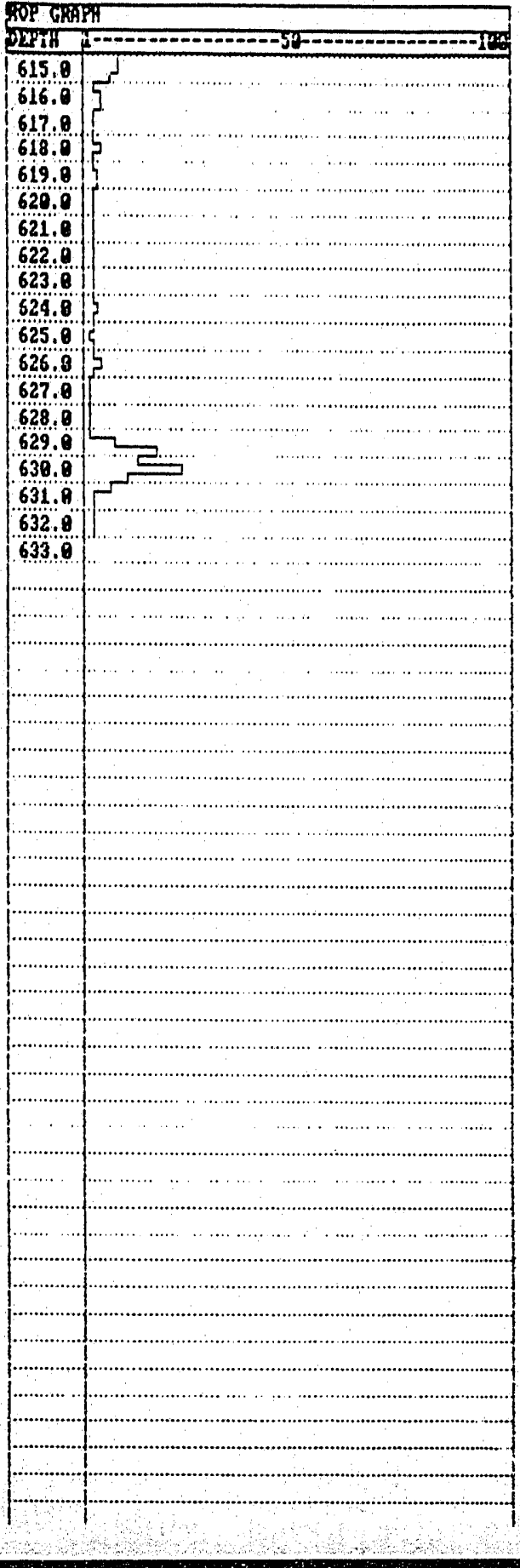
WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #:
GRND:
DATE: 88-02-04 TIME: 1630 EXAMINER: DICKIE/MARION/PIRIE K.B.:
FORMATION: BASAL QTZ CORE NO.: 2 INTERVAL: 615.0 m TO 633.0m RECOVERY: 18.10 m CORE SIZE: 114.3mm
TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 16

INTERVAL	ROCK DESCRIPTION	SHOWS %	SHOWS HC ODOR	FLUOR. %	FLUOR. INTEN	FLUOR. CLR	CUT COLOR	CUT FLUOR	CUT AUG.	SYM	SW REC	COMMENTS & FRAC/DIP STRUCT.
615.0 -616.40	SHALE, SAME AS LAST INTERVAL ON CORE DESCRIPTION #1.											
616.40 -621.25	SILTSTONE/SILTY SAND, CRM-TAN, XF, SIL, MUP, CONS.	1	1	2	1	1	1	1	1.28	?		
621.25 -621.45	SANDSTONE, CRM-TAN, VF-F, MUS, SIL, MUP SA, WAVY BEDDING, 1-2cm THICK	1	1	1	1	2Y	0	1	1.0	□		
621.45 -627.96	SANDSTONE, CRM-DK.GRY, VF-M, MUS, SIL, SR ASPHALTENES OCCUR WHERE THE por= B6 SANDS ARE CLEAN AND STRUCTURELESS. SINGLE 1mm THICK SHALE PARTINGS AT 25cm INTERVALS (APPROX.)	0	1	0	0	0	0	0	0.14	D		
627.96 -628.45	SANDSTONE, GRY, M-C, SIL, MUS, SR-R, B20 HIGHLY CARB, LITHIC, 20-25% ROCK FRAGS	0	0	0	0	0	0	0	0	?		
628.45 -631.22	SILTSTONE/SHALE INTERBEDDED SLIST: CRM-BRN, SIL, CONS, MUP	0	0	0	0	0	0	0	0	?		
631.22 -631.80	SANDSTONE, CRM-GRY, VF, SIL, MS, SR TIGHT, LOW K B6C7	1	1	1	1	2Y	2	3	1.57	□		
631.80 -632.20	SHALE/SILTSTONE, CRM, VF, SIL, CONS, MUP	0	0	0	0	0	0	0	0	D		
632.20 -633.0	SANDSTONE, AS ABOVE IN THE INTERVAL 621.45-627.96, WITH THE EXCEPTION OF LT.& DK. CHERT PEBBLES.	0	1	0	0	0	0	0	0	D		

CORE DESCRIPTION GRAPH

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #:
GRND:
DATE: 88-02-04 TIME: 1630 EXAMINER: DICKIE/MARION/PIRIE K.B.:
FORMATION: BASAL QTZ CORE NO.: 2 INTERVAL: 615.0 m TO 633.0m RECOVERY: 18.10 m CORE SIZE: 114.3mm

TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 16



Start m	Time	Actual	Lost	Mud Report & Remarks	SPM	r/min	Pump Press kPa	Pump Press mm
615	07:56	5			2-3000	65	4800	110
02	08:04	8						
04	16	8			4-5000			
06	18	6						
08	20	4						
10	24	4						
12	44	4	16	CONN.				
	46	2						
	48	2						
618	50	2			4-5000	65	4800	110
20	52	2						
22	56	4						
24	618	2						
619	04:00	2						
28	02	2						
30	620	06	2					
32	08	2						
34	10	2						
36	621	12	2		4-5000	65	4800	110
38	14	2						
40	16	2						
42	622	18	2					
44	20	2						
46	22	2						
48	623	24	2					
50	26	2						
52	28	2						
54	624	30	2		4-5000	65	4800	110
56	32	2						
58	35	3						
60	625	37	2					
62	38	1						
64	40	2						
66	626	50	2	8	CONN			
68	54	4						
70	56	2						
72	627	57	1		4-5000	65	4800	110
74	58	1						
76	59	1						
78	628	16:00	1					
80	01	1						
	02	1						
	329	03	1					
86	10	7						
88	26	16						
90	630	38	12					
92	11:00	22						
94	10	10						
96	631	16	6					
98	18	2						
00	20	2						
02	632	22	2					
04	24	2						
06	26							
08	633							
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CORING LOG

FROM

EASTMAN CHRISTENSEN

16230 - 112 Avenue
Edmonton, Alberta, Canada T5M 2W1
Phone: (403) 451-0120/Telex 037-3502

CALGARY	(403) 264-7222
GRANDE PRAIRIE	(403) 532-2107
ST JOHN'S, NFLD	(709) 726-1020
DARTMOUTH, N.S	(902) 465-5686

Date FEB 4/89 Service Engineer LOGAN GARNPEC

Company SHELL CANADA Contractor ATCO #48

Well Name/No. SHELL ET AL ARROWHEAD B-41

Field ARROWHEAD Hole Size (mm) 215.9

Diamond Bit Size (mm) 215.9x102 Bit No. 06/422

Diamond Bit Type RC476 Core Barrel Size (mm) 171x102x18m.

Length (m) 20.24 No. C-28 Jar No. GRIFF.

Core No. TWO Depth: From 615.0 m To 633.0 m

Total Metres Cored 18.0 Recovered 18.0

Hours 3:06 Formation Cored BASAL QUARTZ

Description SHALE & SANDSTONE

Time Reaming To Bottom CLEAN TO BTM 3m. 1/4 HR.

Mud Wt. (kg/m³) 1090 r/min. 65

Mud Flowrate (m³/min.) 1.4

Bit Condition: Before 98 % After 98 %

RM 331

(White) CUSTOMER COPY (Yellow) EDMONTON COPY (Pink) DISTRICT COPY

CORE DESCRIPTION REPORT

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #:
GRND:
DATE: 88-02-04 TIME: 1630 EXAMINER: DICKIE/MARION/PIRIE K.B.:
FORMATION: BASAL QTZ CORE NO.: 2 INTERVAL: 615.0 m TO 633.0m RECOVERY: 18.10 m CORE SIZE: 114.3mm
TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 16

INTERVAL	ROCK DESCRIPTION	SHOWS %	SHOWS HC ODOR	FLUOR. %	FLUOR. INTEN	FLUOR. CLR	CUT COLOR	CUT FLUOR	AUG. #	SYM	SW REC	COMMENTS & FRAC/DIP STRUCT.
615.0-616.40	SHALE, SAME AS LAST INTERVAL ON CORE DESCRIPTION #1.											
616.40-621.25	SILTSTONE/SILTY SAND, CRM-TAN, XF, SIL, MUP, CONS.	1	1	2	1	1	1	1	1.28	?		
621.25-621.45	SANDSTONE, CRM-TAN, VF-F, MAS, SIL, MUP SA, WAVY BEDDING, 1-2cm THICK	1	1	1	1	2Y	0	1	1.0	□		
621.45-627.96	SANDSTONE, CRM-DK.GRY, VF-M, MAS, SIL, SR ASHPHALTENES OCCUR WHERE THE por= B6 SANDS ARE CLEAN AND STRUCTURELESS. SINGLE 1mm THICK SHALE PARTINGS AT 25cm INTERVALS (APPROX.)	0	1	0	0	0	0	0	0.14	D		
627.96-628.45	SANDSTONE, GRY, M-C, SIL, MAS, SR-R, H20 HIGHLY CARB, LITHIC, 20-25% ROCK FRAGS	0	0	0	0	0	0	0	0	?		
628.45-631.22	SILISTONE/SHALE INTERBEDDED SLIST: CRM-BRN, SIL, CONS, MUP	0	0	0	0	0	0	0	0	?		
631.22-631.80	SANDSTONE, CRM-GRY, VF, SIL, MS, SR TIGHT, LOW K B6C7	1	1	1	1	2Y	2	3	1.57	□		
631.80-632.20	SHALE/SILTSTONE, CRM, VF, SIL, CONS, MUP	0	0	0	0	0	0	0	0	D		
632.20-633.0	SANDSTONE, AS ABOVE IN THE INTERVAL 621.45-627.96, WITH THE EXCEPTION OF LT.& DK. CHERT PEBBLES.	0	1	0	0	0	0	0	0	D		

CORE DESCRIPTION

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #:

GRND:

DATE: 88-02-04 TIME: 1630 EXAMINER: DICKIE/MARION/PIRIE K.B.:

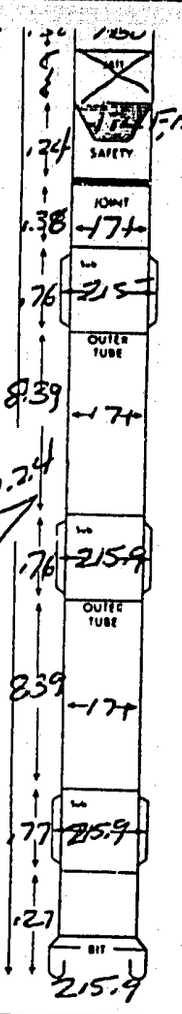
FORMATION: BASAL QTZ CORE NO.: 2 INTERVAL: 615.0 m TO 633.0m RECOVERY: 18.10 m CORE SIZE: 114.3mm

TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 16

ROP GRAPH

DEPTH	1----------50----------100
615.0	
616.0	
617.0	
618.0	
619.0	
620.0	
621.0	
622.0	
623.0	
624.0	
625.0	
626.0	
627.0	
628.0	
629.0	
630.0	
631.0	
632.0	
633.0	

START m		Actual	Lost	Mud Report & Remarks	SPM	r/min	Pump Size / Liner Pressure kPa	Stroke mm
615	07:56				2-3000	65	4800	110
	08:04	8			4-5000			
	12	8						
616	16	4						
	20	4						
	24	4						
617	44	4	16	CONN.				
	46	2						
	48	2						
618	50	2			4-5000	65	4800	110
	52	2						
	54	2						
619	56	2						
	58	2						
	09:00	2						
	03	3						
620	06	3						
	08	2						
	10	2						
621	12	2			4-5000	65	4800	110
	14	2						
	16	2						
622	18	2						
	20	2						
	22	2						
623	24	2						
	26	2						
	28	2						
624	30	2			4-5000	65	4800	110
	32	2						
	35	3						
625	37	2						
	38	1						
	40	2						
626	50	2	8	CONN				
	54	4						
	56	2						
627	57	1			4-5000	65	4800	110
	58	1						
	59	1						
628	16:00	1						
	01	1						
	02	1						
629	03	1						
	19	7						
	26	16						
630	38	12			4-5000	65	4800	110
	11:00	22						
	10	10						
631	16	6						
	18	2						
	20	2						
632	22	2						
	24	2						
	26							
633								



CORING LOG

FROM

EASTMAN CHRISTENSEN

16230 - 112 Avenue
Edmonton, Alberta, Canada T5M 2W1
Phone: (403) 451-0120/Telex 037-3502

CALGARY	(403) 264-7222
GRANDE PRAIRIE	(403) 532-2107
ST JOHN'S, NFLD	(709) 726-1020
DARTMOUTH, N S	(902) 465-5686

Date FEB 4/89 Service Engineer LOGAN GARIPEE

Company SHELL CANADA Contractor ATCO #48

Well Name/No. SHELL ETAL ARROWHEAD B-41

Field ARROWHEAD Hole Size (mm) 215.9

Diamond Bit Size (mm) 215.9 x 102 Bit No. 06/422

Diamond Bit Type RC476 Core Barrel Size (mm) 171 x 102 x 18m.

Length (m) 20.24 No. C-28 Jar No. GRIFF.

Core No. TWO Depth: From 615.0 m To 633.0 m

Total Metres Cored 18.0 Recovered 18.0

Hours 3:06 Formation Cored BASAL QUARTS

Description SHALE & SANDSTONE

Time Reaming To Bottom CLEAN TO BTM 3m. 1/4 HR.

Mud Wt. (kg/m³) 1090 r/min. 65

Mud Flowrate (m³/min.) 1.4

Bit Condition: Before 98 % After 98 %

RM 331

(White) CUSTOMER COPY (Yellow) EDMONTON COPY (Pink) DISTRICT COPY

CORE DETAIL REPORT

WELLNAME: SHELL ET AL ARROWHEAD 8-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #:
GRND:
DATE: 80-02-04 TIME: 1630 EXAMINER: DICKIE/MARION/PIRIE K.B.:
FORMATION: BASAL QTZ CORE NO.: 2 INTERVAL: 615.0 m TO 633.0m RECOVERY: 18.10 m CORE SIZE: 114.3mm

TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 16

INTERVAL	ROCK DESCRIPTION	SHOWS %	SHOWS HC ODOR	FLUOR. %	FLUOR. INTEN	FLUOR. CLR	CUT COLOR	CUT FLUOR	AUG. #	SYM	SW REC	COMMENTS & FRAC/DIP STRUCT.
615.0 -616.40	SHALE, SAME AS LAST INTERVAL ON CORE DESCRIPTION #1.											
616.40 -621.25	SILTSTONE/SILTY SAND, CRM-TAN, XF, SIL, MUP, CONS.	1	1	2	1	1	1	1	1.28	?		
621.25 -621.45	SANDSTONE, CRM-TAN, VF-F, MMS, SIL, MUP SA, WAVY BEDDING, 1-2cm THICK	1	1	1	1	2Y	0	1	1.0	□		
621.45 -627.96	SANDSTONE, CRM-DK.GRY, VF-M, MMS, SIL, SR ASHPHALTENES OCCUR WHERE THE por= B6 SANDS ARE CLEAN AND STRUCTURELESS. SINGLE 1mm THICK SHALE PARTINGS AT 25cm INTERVALS (APPROX.)	0	1	0	0	0	0	0	0.14	D		
627.96 -628.45	SANDSTONE, GRY, M-C, SIL, MMS, SR-R, B20 HIGHLY CARB, LITHIC, 20-25% ROCK FRAGS	0	0	0	0	0	0	0	0	?		
628.45 -631.22	SILTSTONE/SHALE INTERBEDDED SLTST: CRM-BRN, SIL, CONS, MUP	0	0	0	0	0	0	0	0	?		
631.22 -631.80	SANDSTONE, CRM-GRY, VF, SIL, MS, SR TIGHT, LOW K B6C7	1	1	1	1	2Y	2	3	1.57	□		
631.80 -632.20	SHALE/SILTSTONE, CRM, VF, SIL, CONS, MUP	0	0	0	0	0	0	0	0	D		
632.20 -633.0	SANDSTONE, AS ABOVE IN THE INTERVAL 621.45-627.96, WITH THE EXCEPTION OF LT.& DK. CHERT PEBBLES.	0	1	0	0	0	0	0	0	D		

CORE DETAIL ROP GRAPH

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #:

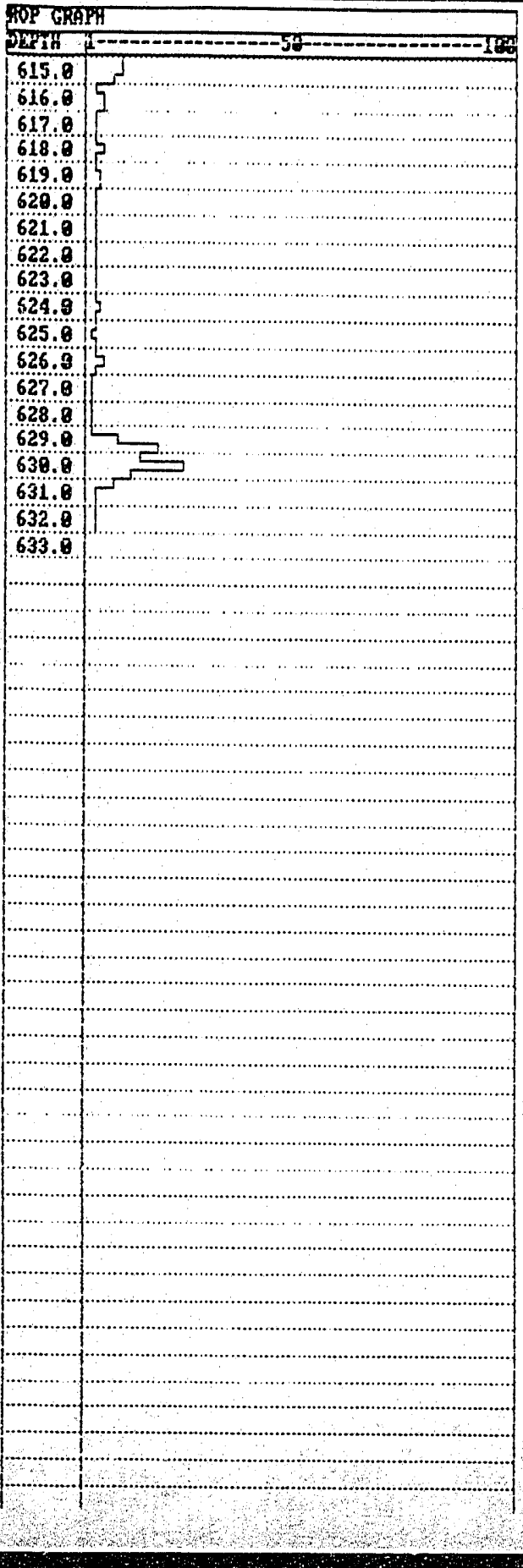
DATE: 88-02-04 TIME: 1630 GRND:

FORMATION: BASAL QTZ CORE NO.: 2 INTERVAL: 615.0 m TO 633.0m EXAMINER: DICKIE/MARION/PIRIE K.B.:

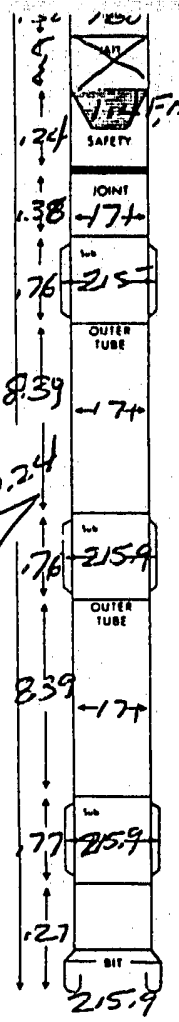
RECOVERY: 18.10 m CORE SIZE: 114.3mm

TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 16

ROP GRAPH



START (m)			Actual	Lost	Mud Report & Remarks	Bit	r/min	Pump Pressure kPa	Pump Stroke mm
0.25	0.2	615	07:56	5		2-3000	65	4800	110
0.50	0.4		08:04	8					
0.75	0.6	616	18	6		4-5000			
1	0.8		24	6					
1.25	1.0		34	4					
1.50	1.2	617	44	4	16 Conn.				
1.75	4		46	2					
2.00	.6		48	2					
2.25	1.8	618	50	2		4-5000	65	4800	110
2.50	2.0		52	2					
2.75	2.2		56	4					
3.00	2.4	619	58	2					
3.25	2.6		09:00	2					
3.50	2.8		03	3					
3.75	3.0	620	06	3					
4.00	3.2		08	2					
4.25	3.4		00	2					
4.50	3.6	621	12	2		4-5000	65	4800	110
4.75	3.8		14	2					
5.00	4.0		16	2					
5.25	4.2	622	18	2					
5.50	4.4		20	2					
5.75	4.6		22	2					
6.00	4.8	623	24	2					
6.25	5.0		26	2					
6.50	5.2		28	2					
6.75	5.4	624	30	2		4-5000	65	4800	110
7.00	5.6		32	2					
7.25	5.8		35	3					
7.50	6.0	625	37	2					
7.75	6.2		38	1					
8.00	6.4		40	2					
8.25	6.6	626	50	2	8 Conn				
8.50	6.8		54	4					
8.75	7.0		56	2					
9.00	7.2	627	57	1		4-5000	65	4800	110
9.25	7.4		58	1					
9	7.6		59	1					
9.	7.8	628	16:00	1					
10.00	8.0		01	1					
10.25	2		02	1					
10.50	4	629	03	1					
10.75	8.6		10	7					
11.00	8.8		26	16					
11.25	9.0	630	38	12		4-5000	65	4800	110
11.50	9.2		11:00	22					
11.75	9.4		10	10					
12.00	9.6	631	16	6					
12.25	9.8		18	2					
12.50	10.0		20	2					
12.75	10.2	632	32	12					
13.00	10.4		34	2					
13.25	10.6		36						
13.50	10.8	633							
13.75	11.0								
14.00	11.2								
14.25	11.4								
14.50	11.6								
14.75	11.8								
15.00	12.0								
15.25	12.2								
15.50	12.4								
15.75	12.6								
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16.50	13.2								
16.75	13.4								
17.00	13.6								
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	17.8								
	18.0								
	18.2								



CORING LOG

FROM

EASTMAN CHRISTENSEN

16230 - 112 Avenue
Edmonton, Alberta, Canada T5M 2W1
Phone: (403) 451-0120/Telex 037-3502

CALGARY (403) 264-7222
GRANDE PRAIRIE (403) 532-2107
ST JOHN'S, NFLD (709) 726-1020
DARTMOUTH, N.S (902) 465-5686

Date FEB 4/89 Service Engineer LOGAN GARNEE

Company SHELL CANADA Contractor ATCO #48

Well Name/No. SHELL ET AL ARROWHEAD B-41

Field ARROWHEAD Hole Size (mm) 215.9

Diamond Bit Size (mm) 215.9 x 102 Bit No. 06.422

Diamond Bit Type RC476 Core Barrel Size (mm) 171 x 102 x 18m.

Length (m) 20.24 No. C-28 Jar No. GRIFF.

Core No. TWO Depth: From 615.0 m To 633.0 m

Total Metres Cored 18.0 Recovered 18.0

Hours 3:06 Formation Cored BASAL QUARTS

Description SHALE & SANDSTONE

Time Reaming To Bottom CLEAN TO BTM 3m. 1/4 HR.

Mud Wt. (kg/m³) 1090 r/min. 65

Mud Flowrate (m³/min.) 1.4

Bit Condition: Before 98 % After 98 %

Delete the column which doesn't apply.

FORM 331

(White) CUSTOMER COPY (Yellow) EDMONTON COPY (Pink) DISTRICT COPY

CORE DETAIL REPORT

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: ARROWHEAD FIELD/AREA: WILDCAT C.W.O. #: 86972
GRND: 512.48
DATE: 89-03-01 TIME: 1200 EXAMINER: BELYK,DICKIE K.B.: 519.99
FORMATION: LANDRY CORE NO.: 3 INTERVAL: 2855.0 m TO 2869.8 RECOVERY: 14.47 m CORE SIZE: 114 mm
TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 13

		SHOWS		FLUOR.			CUT					
INTERVAL	ROCK DESCRIPTION	%	HC ODOR	%	INTEN	CLR	COLOR	FLUOR	RUG.	SYM	SW REC	COMMENTS & FRAC/DIP STRUCT.
2855.0-	SH: DK GRY to LT GRN,F IEX,SFT to	0	0	0	0	0	0	0	0	?		
2860.2	firm,BLKY BDG,SL to V CALRUS											
	modeled LT GRY NODS (2-10cm) within											
	DK GRN CALRUS SH,DK GRY SH INTBD W											
	LMST alternating intervals approx.											
	1mm in thickness											
	***bed contact is at 2860.20 meters											
2860.2-	DOLOMITE,I-I/III,LT.GRY-WH,F-MED,CLN	1	0	0	0	0	0	0	.14	D		2-3cm BANDS OF WH-GRY,SLI
2862.30	-SLI,B2 C4 Dtr											MOTTLED,PYROBIT. DOMINANT IN
												GRY DOL.-STYOLITES PRESENT
												MINOR VERT. FRACS WITH CALC
												INFILLING.
2862.80-	DOLOMITE,I/III,LT.GRY-WH,F-MED,CLN-	1	0	0	0	0	0	0	.14	D		ALTERNATING DK.& LT.1cm BAND
2863.55	SLI,B2 C6 D2											ING.TRACE COARSE CRYSTALS
												LINING VUGS.
2863.55-	DOL,I/III,LT.GRY-WH,MED,CLN-SLI	1	0	0	0	0	0	0	.14	?		LARGE 7-8cm VUGS THROUGOUT
2864.15	Btr C2 D6											INTERVAL,LINED WITH COARSE
												SADDLE DOLOMITE,TRACES OF
												PYRITE AND CALCITE IN VUGS.
2864.15-	DOL,I/III,WH-LT.GRY,VF-MED,CLN-SLI	1	0	0	0	0	0	0	.14	D		ALTERNATING MOTTLED-BANDED
2866.05	Btr											TRACE CALCITE - QUARTZ -PYR
												SOME PYROBIT. STAINING.
												VERTICAL FRACS FILLED WITH
												QUARTZ,1/2cm THICKNESS.
2866.05-	DOL,I-I/III,WH-BUFF-GRY,F-MED,CLN-	1	0	0	0	0	0	0	.14	D		MOTTLED DOL,INCREASINGLY
2867.30	SLI, Dtr											TIGHT
2867.30-	DOL,GRY-WH,I-I/III,MXNL-MED,CLN-SLI	1	0	0	0	0	0	0	.14	D		MOTTLED DOL,WITH LIMITED
2869.47	Ctr											POROSITY,SOME PYRITE INFILLI
												NG IN FRACS,GRAINY TOWARD
												BOTTOM OF INTERVAL.

CORE DETAIL ROP GRAPH

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: ARROWHEAD FIELD/AREA: WILDCAT C.W.O. #: D6972

GRND: 512.48

DATE: 89-03-01 TIME: 1200 EXAMINER: BELYK.DICKIE K.B.: 519.99

FORMATION: LANDRY CORE NO.: 3 INTERVAL: 2855.0 m TO 2869.8 RECOVERY: 14.47 m CORE SIZE: 114 mm

TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 13

ROP GRAPH

DEPTH	1----------50----------100
2855.0	
2856.0	
2857.0	
2858.0	
2859.0	
2860.0	
2861.0	
2862.0	
2863.0	
2864.0	
2865.0	
2866.0	
2867.0	
2868.0	
2869.0	

START (m)		DEPTH (m)	TIME	MIN/METRE Actual	MIN/METRE Lost	Mud Report & Remarks	WEIGHT daN	r/min	PUMP SIZE 152 x 235 Pressure kPa	PUMP SIZE 152 x 235 Stroke mm
		2855	21:22							
0.25	0.2			34	12					
0.50	0.4			44	10					
10	0.6	2856		54	10					
	0.8		22:06	12						
	1.0			14	8					
21.50	1.2	2857		22	8					
1.75	1.4			32	10					
2.00	1.6			42	10					
32.25	1.8	2858		52	10					
2.50	2.0		23:00	8						
2.75	2.2			10	10					
43.00	2.4	2859		18	8					
3.25	2.6			44	12	14				
3.50	2.8			54	10					
53.75	3.0	2860	00:04	10	10					
4.00	3.2			10	6					
4.25	3.4			16	6					
64.50	3.6	2861		20	4					
4.75	3.8			24	4					
5.00	4.0			27	3					
75.25	4.2	2862		30	3					
5.50	4.4			36	3					
5.75	4.6			38	2					
86.00	4.8	2863		48	5					
6.25	5.0			47	5					
6.50	5.2			50	3					
6.75	5.4	2864		55	5					
7.00	5.6			59	4					
7.25	5.8		01:02	3						
80.50	6.0	2865		06	4					
7.75	6.2			10	4					
8.00	6.4			15	5					
18.25	6.6	2866		20	5					
8.50	6.8			23	3					
8.75	7.0			27	4					
29.00	7.2	2867		30	3					
9.25	7.4			32	2					
	7.6			36	4					
3	7.8	2868		40	4					
10.00	8.0			45	5					
10.25	8.2			50	5					
40.50	8.4	2869	02:06	6	10					
10.75	8.6			10	4					
11.00	8.8			16	6					
51.25	9.0	2870								
11.50	9.2									
11.75	9.4									
62.00	9.6	2871								
12.25	9.8									
12.50										
12.75	10.2	2872								
13.00	10.4									
13.25	10.6									
83.50	10.8	2873								
13.75	11.0									
14.00	11.2									
14.25	11.4									
14.50	11.6									
14.75	11.8									
15.00	12.0									
15.25	12.2									
15.50	12.4									
15.75	12.6									
16.00	12.8									
16.25	13.0									
16.50	13.2									
16.75	13.4									
17.00	13.6									
17.25	13.8									
17.50	14.0									
17.75	14.2									
	14.8									
	15.0									
	15.2									
	15.4									
	15.6									
	15.8									
	16.0									
	16.2									
	16.4									
	16.6									
	16.8									
	17.0									
	17.2									
	17.4									
	17.6									
	17.8									
	18.0									
	18.2									

1120 MUD

5000 75/85 6000 94

5000 75/85 6000 94

5000 80/85 6200 95

5000 80/85 6200 95

5000 80/85 6200 95

5000 80/85 6200 95

5000 80/85 6200 95

5000 80/85 5800 96-97

TORQUE DROP OFF TOO

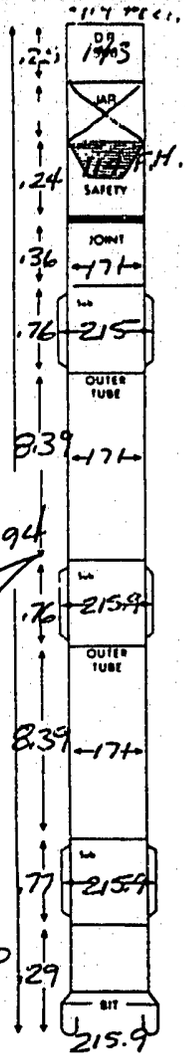
JAMMED OFF

WL 7.0 P.H. 10

Conn.

3 Std Block.

Conn. No Brake on Conn



CORING LOG

FROM

EASTMAN CHRISTENSEN

16230 - 112 Avenue
Edmonton, Alberta, Canada T5M 2W1
Phone: (403) 451-0120/Telex 037-3502

CALGARY	(403) 264-7222
GRANDE PRAIRIE	(403) 532-2107
ST. JOHN'S, NFLD	(709) 726-1020
DARTMOUTH, N.S	(902) 465-5686

Date FEB 28/89 Service Engineer LOGAN GARDIPEE

Company SHELL CANADA. Contractor ATCO 48

Well Name/No. SHELL ET AL AZEVEHEAD E-41

Fie'd _____ Hole Size (mm) 215.9

Diamond Bit Size (mm) 215.9 x 102 Bit No. 061549

Diamond Bit Type SCP 778 Core Barrel Size (mm) 171 x 102 x 18m

Length (m) 19.94 No. C-28 Jar No. GRIFF-STRING

Core No. THREE Depth: From 2855.0 m To 2869.8 m

Total Metres Cored 14.8 Recovered 14.47

Hours 4:11 Formation Cored HUME PRESQUILE

Description _____

Time Reaming To Bottom REAM 18m 1½ HRS

Mud Wt. (kg/m³) 1120 r/min. 80-85

Mud Flowrate (m³/min.) 1.2

Bit Condition: Before 90 % After _____ %

* Delete the column which doesn't apply.

FORM 331

(White) CUSTOMER COPY (Yellow) EDMONTON COPY (Pink) DISTRICT COPY

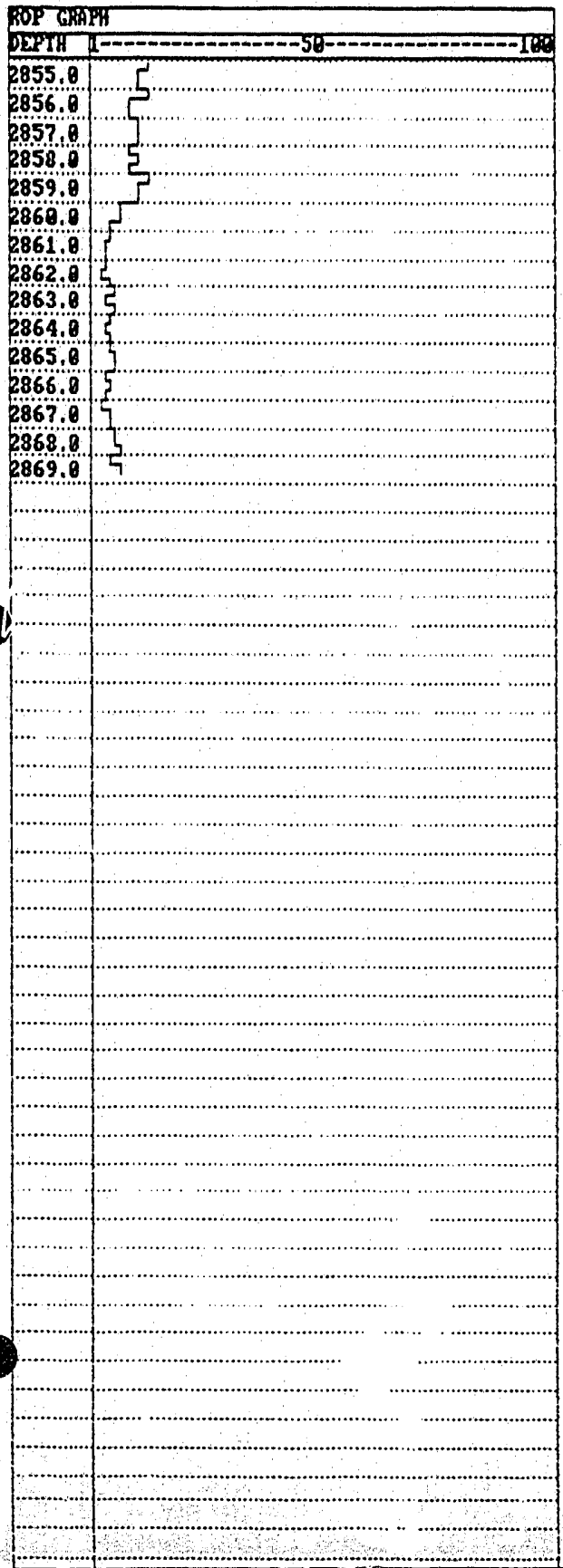
CORE DETAIL REPORT

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: ARROWHEAD FIELD/AREA: WILDCAT C.W.O. #: D6972
GRND: 512.48
DATE: 89-03-01 TIME: 1200 EXAMINER: BELYK,DICKIE K.B.: 519.99
FORMATION: LANDRY CORE NO.: 3 INTERVAL: 2855.0 m TO 2869.8 RECOVERY: 14.47 m CORE SIZE: 114 mm
TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 13

INTERVAL	ROCK DESCRIPTION	SHOWS %	HC ODOR	FLUOR. %	INTEN	CLR	CUT COLOR	FLUOR	AVG. #	SYM	SW REC	COMMENTS & FRAC/DIP STRUCT.
2855.0-2869.2	SH: DK GRY to LT GRN,F TEX,SFT to firm,BLKY BDG,SL to V CALRUS modeled LT GRY NODS (2-10cm) within DK GRN CALRUS SH,DK GRY SH INTBD W LMST alternating intervals approx. 1mm in thickness ***bed contact is at 2860.20 meters	0	0	0	0	0	0	0	0			
2860.2-2862.30	DOLOMITE,I-I/III,LT.GRY-WH,F-MED,CLN-SLI,B2 C4 Dtr	1	0	0	0	0	0	0	.14	D		2-3cm BANDS OF WH-GRY,SLI MOTTLED,PYROBIT. DOMINANT IN GRY DOL.-STYOLITES PRESENT MINOR VERT. FRACS WITH CALC INFILLING.
2862.80-2863.55	DOLOMITE,I/III,LT.GRY-WH,F-MED,CLN-SLI,B2 C6 D2	1	0	0	0	0	0	0	.14	D		ALTERNATING DK.& LT.1cm BANDING.TRACE COARSE CRYSTALS LINING VUGS.
2863.55-2864.15	DOL,I/III,LT.GRY-WH,MED,CLN-SLI Btr C2 D6	1	0	0	0	0	0	0	.14	P		LARGE 7-8cm VUGS THROUGOUT INTERVAL,LINED WITH COARSE SADDLE DOLOMITE,TRACES OF PYRITE AND CALCITE IN VUGS.
2864.15-2866.05	DOL,I/III,WH-LT.GRY,VF-MED,CLN-SLI Btr	1	0	0	0	0	0	0	.14	D		ALTERNATING MOTTLED-BANDED TRACE CALCITE - QUARTZ -PYR SOME PYROBIT. STAINING. VERTICAL FRACS FILLED WITH QUARTZ,1/2cm THICKNESS.
2866.05-2867.30	DOL,I-I/III,WH-BUFF-GRY,F-MED,CLN-SLI, Dtr	1	0	0	0	0	0	0	.14	D		MOTTLED DOL,INCREASINGLY TIGHT
2867.30-2869.47	DOL,GRY-WH,I-I/III,MXML-MED,CLN-SLI Ctr	1	0	0	0	0	0	0	.14	D		MOTTLED DOL,WITH LIMITED POROSITY,SOME PYRITE INFILLING IN FRACS,GRAINY TOWARD BOTTOM OF INTERVAL.

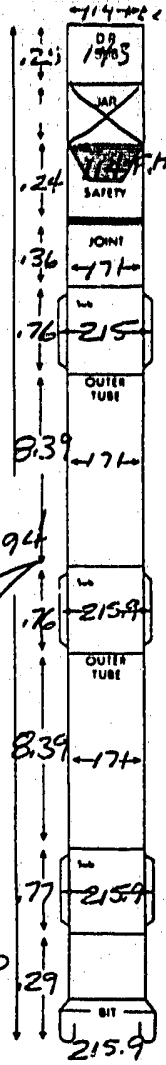
CORE DETAIL ROP GRAPH

WELLNAME: SHELL ET AL ARROWHEAD 9-41 LOCATION: ARROWHEAD FIELD/AREA: WILDCAT C.W.O. #: 06972
GRND: 512.48
DATE: 89-03-01 TIME: 1200 EXAMINER: BELYK,DICKIE K.B.: 519.99
FORMATION: LANDRY CORE NO.: 3 INTERVAL: 2855.0 m TO 2869.8 RECOVERY: 14.47 m CORE SIZE: 114 mm
TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 13



START (m)	DEPTH (m)	TIME	MIN / METRE Actual	MIN / METRE Lost	Mud Report & Remarks	WEIGHT daN	r/min	PUMP SIZE 152 x 235 Pressure kPa	PUMP SIZE 152 x 235 Stroke mm
0.75	0.0	2855	21:22						
0.50	0.4		34	12					
10.	0.4		44	10		2:3000	60	6200	94
	0.8	2856	54	10		4-5000	75-85	6000	94
1.	1.2		22:04	12					
1.25	1.0		14	8					
21.50	1.2	2857	22	8	VIS 73 WT 1120				
1.75	1.4		32	10					
2.00	1.6		42	10	WL 7.0 PH 10				
32.25	1.8	2858	52	10		5000	75/85	6000	94
2.50	2.0		23:00	8					
2.75	2.2		10	10					
43.00	2.4	2859	18	8					
3.25	2.6		40	12	14 CONN.				
3.50	2.8		54	10					
53.75	3.0	2860	00:04	10		5000	80/85	6200	95
4.00	3.2		10	6					
4.25	3.4		16	6					
64.50	3.6	2861	20	4					
4.75	3.8		24	4					
5.00	4.0		27	3					
75.25	4.2	2862	30	3		5000	80/85	6200	95
5.50	4.4		36	3	3 SET Black.				
5.75	4.6		38	2					
86.00	4.8	2863	42	4					
6.25	5.0		47	5					
6.50	5.2		50	3					
76.75	5.4	2864	55	5		5000	80/85	6200	95
7.00	5.6		59	4					
7.25	5.8		01:02	3					
10.50	6.0	2565	06	4					
7.75	6.2		10	4					
8.00	6.4		15	5					
118.25	6.6	2866	20	5		5000	80/85	6200	95
8.50	6.8		23	3					
8.75	7.0		27	4					
12.00	7.2	2867	30	3					
9.25	7.4		32	2					
9.	7.6		36	4					
139.	7.8	2868	40	4		5000	80/85	6200	95
10.00	8.0		45	5					
10.25	8.2		50	5					
140.50	8.4	2869	02:06	6	10 CONN. NO	BRAKE ON	CONN.		
10.75	8.6		10	4					
11.00	8.8		16	6		5-6000	80/85	5800	96-97
151.25	9.0	2870				TORQUE DROP	OFF	T&O	
11.50	9.2					JAMMED	OFF		
11.75	9.4								
12.00	9.6	2871							
12.25	9.8								
12.50	10.0								
17.75	10.2	2872							
13.00	10.4								
13.25	10.6								
18.50	10.8	2873							
13.75	11.0								
14.00	11.2								
14.25	11.4								
14.50	11.6								
14.75	11.8								
15.00	12.0								
15.25	12.2								
15.50	12.4								
15.75	12.6								
16.00	12.8								
16.25	13.0								
16.50	13.2								
16.75	13.4								
17.00	13.6								
17.25	13.8								
17.50	14.0								
17.75	14.2								
18.	14.4								
	14.6								
	14.8								
	15.0								
	15.2								
	15.4								
	15.6								
	15.8								
	16.0								
	16.2								
	16.4								
	16.6								
	16.8								
	17.0								
	17.2								
	17.4								
	17.6								
	17.8								
	18.0								
	18.2								

* Delete the column which doesn't apply.



CORING LOG

FROM

EASTMAN CHRISTENSEN

16230 - 112 Avenue
Edmonton, Alberta, Canada T5M 2W1
Phone: (403) 451-0120/Telex 037-3502

CALGARY	(403) 264-7222
GRANDE PRAIRIE	(403) 532-2107
ST. JOHN'S, NFLD	(709) 726-1020
DARTMOUTH, N.S.	(902) 465-5686

Date FEB 28/89 Service Engineer LOGAN GARDIPEE

Company SHELL CANADA. Contractor ATCO 48

Well Name/No. SHELL ET AL ARROWHEAD B-41

Field _____ Hole Size (mm) 215.9

Diamond Bit Size (mm) 215.9 x 102 Bit No. 061549

Diamond Bit Type SCP 778 Core Barrel Size (mm) 171 x 102 x 18m

Length (m) 19.94 No. C-28 Jar No. GRIFF-STRING

Core No. THREE Depth: From 2855.0 m To 2869.9 m

Total Metres Cored 14.8 Recovered 14.47

Hours 4:11 Formation Cored HUME PRESQUILE

Description _____

Time Reaming To Bottom REAM 18m 1½ HRS

Mud Wt. (kg/m³) 1120 r/min. 80-85

Mud Flowrate (m³/min.) 1.2

Bit Condition: Before 90 % After _____ %

FORM 331

(White) CUSTOMER COPY (Yellow) EDMONTON COPY (Pink) DISTRICT COPY

CORE DETAIL REPORT

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: ARROWHEAD FIELD/AREA: WILDCAT C.W.O. #: D6972
GRND: 512.48
DATE: 89-03-01 TIME: 1200 EXAMINER: BELYK,DICKIE K.B.: 519.99
FORMATION: LANDRY CORE NO.: 3 INTERVAL: 2855.0 m TO 2869.8 RECOVERY: 14.47 m CORE SIZE: 114 mm
TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 13

		SHOWS		FLUOR.			CUT					
INTERVAL	ROCK DESCRIPTION	%	MC ODOR	%	INTEN	CLR	COLOR	FLUOR	CUT	SYM	SW REC	COMMENTS & FRAC/DIP STRUCT.
2855.0- 2860.2	SH: DK GRY to LT GRN,F TEX,SFT to firm,BLKY BDG,SL to V CALRUS modeled LT GRY NODS (2-10cm) within DK GRN CALRUS SH,DK GRY SH INTBD W LMST alternating intervals approx. 1mm in thickness ***bed contact is at 2860.20 meters	0	0	0	0	0	0	0	0	?		
2860.2- 2862.30	DOLOMITE,I-I/III,LT.GRY-WH,F-MED,CLN -SLI,B2 C4 Dtr	1	0	0	0	0	0	0	.14	D		2-3cm BANDS OF WH-GRY,SLI MOTTLED,PYROBIT. DOMINANT IN GRY DOL.-STYOLITES PRESENT MINOR VERT. FRACS WITH CALC INFILLING.
2862.80- 2863.55	DOLOMITE,I/III,LT.GRY-WH,F-MED,CLN- SLI,B2 C6 D2	1	0	0	0	0	0	0	.14	D		ALTERNATING DK.& LT.1cm BAND ING.TRACE COARSE CRYSTALS LINING VUGS.
2863.55- 2864.15	DOL,I/III,LT.GRY-WH,MED,CLN-SLI Btr C2 D6	1	0	0	0	0	0	0	.14	?		LARGE 7-8cm VUGS THROUGOUT INTERVAL,LINED WITH COARSE SADDLE DOLOMITE,TRACES OF PYRITE AND CALCITE IN VUGS.
2864.15- 2866.05	DOL,I/III,WH-LT.GRY,VF-MED,CLN-SLI Btr	1	0	0	0	0	0	0	.14	D		ALTERNATING MOTTLED-BANDED TRACE CALCITE - QUARTZ -PYR SOME PYROBIT. STAINING. VERTICAL FRACS FILLED WITH QUARTZ,1/2cm THICKNESS.
2866.05- 2867.30	DOL,I-I/III,WH-BUFF-GRY,F-MED,CLN- SLI, Dtr	1	0	0	0	0	0	0	.14	D		MOTTLED DOL,INCREASINGLY TIGHT
2867.30- 2869.47	DOL,GRY-WH,I-I/III,MXNL-MED,CLN-SLI Ctr	1	0	0	0	0	0	0	.14	D		MOTTLED DOL,WITH LIMITED POROSITY,SOME PYRITE INFILLI NG IN FRACS,GRAINY TOWARD BOTTOM OF INTERVAL.

CORE DETAIL ROP GRAPH

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: ARROWHEAD FIELD/AREA: WILDCAT C.W.O. #: D6972

GRND: 512.48

DATE: 89-03-01 TIME: 1200 EXAMINER: BELYK,DICKIE K.B.: 519.99

FORMATION: LANDRY CORE NO.: 3 INTERVAL: 2855.0 m TO 2869.8 RECOVERY: 14.47 m CORE SIZE: 114 mm

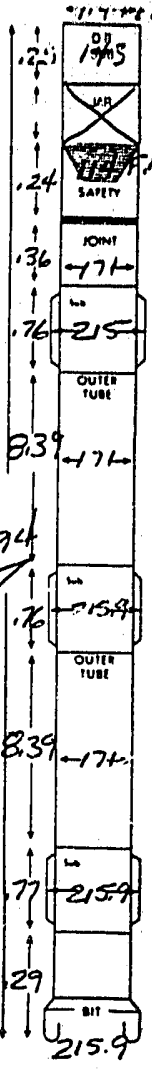
TYPE SDWLL SAMPLER: SDWLL REC. - NO. OF SHOTS: NO. RECOV: NO. OF BOXES: 13

ROP GRAPH

DEPTH	1----------50----------100
2855.0	
2856.0	
2857.0	
2858.0	
2859.0	
2860.0	
2861.0	
2862.0	
2863.0	
2864.0	
2865.0	
2866.0	
2867.0	
2868.0	
2869.0	

START (m)	DEPTH (m)	TIME	MIN/METRE Actual	MIN/METRE Lost	Mud Report & Remarks	WEIGHT daN	r/min	PUMP SIZE 152 x 235 Pressure kPa	PUMP SIZE 152 x 235 Stroke mm
0.25	0.4	2855	21:22	3d					
0.50	0.6			4					
10.	0.8	2856		5		2:3000	60	6200	94
1.	1.0		22:06	12		4:5000	75-85	6000	94
1.25	1.2			14					
21.50	1.4	2857		22					
1.75	1.6			32					
2.00	1.8			42					
32.25	2.0	2858		52					
2.50	2.2		23:00	8					
2.75	2.4			10					
43.00	2.6	2859		18					
3.25	2.8			44	12				
3.50	3.0			54	10				
53.75	3.2	2860	00:08	10					
4.00	3.4			16	6				
4.25	3.6			20	4				
64.50	3.8	2861		24	4				
4.75	4.0			27	3				
5.00	4.2			30	3				
75.25	4.4	2862		36	3				
5.50	4.6			38	2				
5.75	4.8			42	4				
86.00	5.0	2863		47	5				
6.25	5.2			50	3				
6.50	5.4			55	5				
76.75	5.6	2864		59	4				
7.00	5.8		01:02	3					
7.25	6.0			06	4				
10.50	6.2	2865		10	4				
7.75	6.4			15	5				
8.00	6.6			20	5				
118.25	6.8	2866		23	3				
8.50	7.0			27	4				
8.75	7.2			30	3				
129.00	7.4	2867		32	2				
9.25	7.6			36	4				
9.50	7.8			40	4				
139.	8.0	2868		45	5				
10.00	8.2			50	5				
10.25	8.4			56	6				
140.50	8.6	2869	02:06	10	4				
10.75	8.8			16	6				
11.00	9.0								
151.25	9.2	2870							
11.50	9.4								
11.75	9.6								
162.00	9.8	2871							
12.25	10.0								
12.50	10.2								
172.75	10.4	2872							
13.00	10.6								
13.25	10.8								
183.50	11.0	2873							
13.75	11.2								
14.00	11.4								
14.25	11.6								
14.50	11.8								
14.75	12.0								
15.00	12.2								
15.25	12.4								
15.50	12.6								
15.75	12.8								
16.00	13.0								
16.25	13.2								
16.50	13.4								
16.75	13.6								
17.00	13.8								
17.25	14.0								
17.50	14.2								
17.75	14.4								
18.	14.6								
18.	14.8								
	15.0								
	15.2								
	15.4								
	15.6								
	15.8								
	16.0								
	16.2								
	16.4								
	16.6								
	16.8								
	17.0								
	17.2								
	17.4								
	17.6								
	17.8								
	18.0								
	18.2								

1:3000	60	6200	94	
4:5000	75-85	6000	94	
5000	75/85	6000	94	
5000	80/85	6200	95	
5000	80/85	6200	95	
5000	80/85	6200	95	
5000	80/85	6200	95	
5000	80/85	6200	95	
5:6000	80/85	5800	96-97	
TORQUE DROP OFF TOO				
JAMMED OFF				



CORING LOG

FROM

EASTMAN CHRISTENSEN

16230 - 112 Avenue
Edmonton, Alberta, Canada T5M 2W1
Phone: (403) 451-0120/Telex 037-3502

CALGARY	(403) 264-7222
GRANDE PRAIRIE	(403) 532-2107
ST. JOHN'S, NFLD	(709) 726-1020
DARTMOUTH, N.S	(902) 465-5686

Date FEB 28/89 Service Engineer LOGAN GARDIPEE

Company SHELL CANADA. Contractor ATCO 48

Well Name/No. SHELL ET AL ARROWHEAD B-41

Field _____ Hole Size (mm) 215.9

Diamond Bit Size (mm) 215.9 x 102 Bit No. 061549

Diamond Bit Type SCP 778 Core Barrel Size (mm) 171 x 102 x 18m

Length (m) 19.94 No. C-28 Jar No. GRIFF-STRING

Core No. THREE Depth: From 2855.0 m To 2869.8 m

Total Metres Cored 14.8 Recovered 14.47

Hours 4:11 Formation Cored HUME PRESQUILE

Description _____

Time Reaming To Bottom REAM 18m 1½ HRS

Mud Wt. (kg/m³) 1120 r/min. 80-85

Mud Flowrate (m³/min.) 1.2

Bit Condition: Before 90 % After _____ %

FORM 331

(White) CUSTOMER COPY (Yellow) EDMONTON COPY (Pink) DISTRICT COPY

* Delete the column which doesn't apply.

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #: 06972
GRND: 512.48
DATE: 89/03/02 TIME: 8:30 EXAMINER: J.D/BELYK/MARION K.B.: 519.99
FORMATION: HUME CORE NO.: 4 INTERVAL: 2869.8 m TO 2887.8 RECOVERY: 18.0 m CORE SIZE: 114 mm
TYPE SDWLL SAMPLER: N/A SDWLL REC. - NO. OF SHOTS: N/A NO. RECOV: N/A NO. OF BOXES: 16

INTERVAL	ROCK DESCRIPTION	SHOWS %	HC ODOR	FLUOR. %	INTEN	CLR	CUT COLOR	FLUOR	PERM. AVG.	SYMBOL	SW REC	COMMENTS & FRAC/DIP STRUCT.
2869.80-2870.80	DOL: WH to LT GRY, I-I/III, CRYPTO to MED XLN, Btr, V CLN to SL	1	0	0	0	0	0	0	.143	?		Alternate Banding, Limited POR, TR PYBIT W XLN, TI MTRX
2870.80-2875.00	DOL: WH W SL LT GRY banding, I-I/III, CRYPTO to F XLN, C4, D2 POR, CLN to SL,	1	0	0	0	0	0	0	.143	?		OCC LGE VUGS Lined W Calcite And Quartz With Minor Pyrite Showing. STYLS Present With Extensive Fracturing
2875.00-2876.65	DOL: WH W MOD LT GRY COL, I-I/III, CRYPTO to V F XLN, B3 POR	1	0	0	0	0	0	0	.143	?		Feathered Banding, V Limited POR, TR PYBIT, OCC STYLS, V CLN
2876.65-2882.40	DOL: LT GRY TO WH, I-I/III, CRYPTO to MED XLN, B3, C5, D3 POR	1	0	0	0	0	0	0	.143	?		Extensive Vertical FRACS, At 2876.90 Huge Vug Present Lined With Calcite, Within Rare Large Vugs, Are Lined d With Calcite And Pyrite, Interval Has A Mottled appearance
2882.40-2883.50	DOL, LT. GRY-WH, I-I/III, CRYPTO-C, CLN Ctr-1 Dtr-1	0	0	0	0	0	0	0	0	?		vertical fracs, w/calcite and pyrite infilling. 82.6-82.75m rare large vugs lined w/qtz and saddle dolomite xtals. Matrix has a spotted alternating appearance.
2883.50-2885.75	DOL, WH-GRY, I, MXLN-CRYPTO, CLN B3 C3 D4	0	0	0	0	0	0	0	0	?		good vuggy por present, largly overgrown with calcite, qtz, and saddle dolomite xtals. vuggy por is of varying size and nonuniform in pattern.
2885.75-2886.75	DOL, WH-GRY-BLK, I, C, SLI-MOD, Btr C6 D2	0	0	0	0	0	0	0	0	?		uniform porosity, with calc, qtz, and pyr xtal growth, some of the matrix appears carbonaceous, mottled to zebra color pattern.
2886.75-2887.16	DOL, WH-SLI. LT. GRY, I, C, CLN, Btr, C3, D2	0	0	0	0	0	0	0	0	?		extensive vertical and horiz fracs, large pyr deposits in vugs and fracs, vugs lined w/ qtz, calc, dolo, pyr.
2887.16-2887.80	DOL, WH-GRY, I, C, VERY, Btr, Ctr, D2	0	0	0	0	0	0	0	0	?		massive carbonaceous matrix, indication of qtz healed fracs, large vugs lined with calc, qtz, saddle dolo, pyr.

EXAMINER: J.D.KELLY/MARION K.B.: 512.39

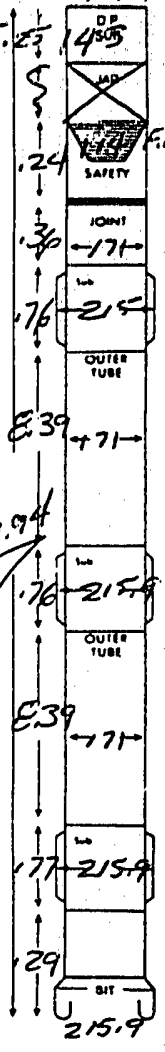
FORMATION: HUME CORE NO.: 1 INTERVAL: 2869.8 TO 2887.8 RECOVERY: 18.0 CORE SIZE: 114

TYPE SDWLL SAMPLER: N/A SDWLL REC. - NO. OF SHOTS: N/A NO. RECOV: N/A NO. OF BOXES: 16

ROP GRAPH

DEPTH	1----------50----------100
2869.0	
2870.0	
2871.0	
2872.0	
2873.0	
2874.0	
2875.0	
2876.0	
2877.0	
2878.0	
2879.0	
2880.0	
2881.0	
2882.0	
2883.0	
2884.0	
2885.0	
2886.0	
2887.0	

START (m)	DEPTH (m)	TIME	MIN/METRE Actual	MIN/METRE Lost	Mud Report & Remarks	WEIGHT daN	r/min	PUMP SIZE 152 x 23 Pressure kPa	PUMP SIZE Stroke mm
	2869								
		11:56				2-3000	60	6800	95
	2870	18:00	4.			4-5000	85	6800	95
		04	4						
		08	4						
	2871	12	4.						
		16	4.						
		20	4.						
	2872	24	4.						
		28	4						
		34	5.		VIS 68 WT 1115				
	2873	38	5.			5000	85	6800	95
		41	3.						
		45	4.						
	2874	48	3.						
		52	4.						
		56	4.						
	2875	19:00	4.						
		05	5.						
		09	4.						
	2876	13	4.			5000	85	6600	95
		17	4.						
		24	4.	3	TIGHTEN AIR LINE TO RATE CLUTCH				
	2877	28	4.						
		35	2.						
		38	3.						
	2878	37	4.						
		40	3.						
		51	3.	14	CLEAN				
	2879	20:09	3.						
		03	3.						
		07	4.						
	2880	10	3.			5000	85	6600	95
		14	4.						
		18	4.						
	2881	21	3.						
		25	4.						
		28	3.						
	2882	32	4.						
		36	4.						
		40	4.						
	2883	45	5.						
		49	4.						
		53	4.						
	2884	56	3.			5000	85	6600	95
		21:00	4.						
		04	4.						
	2885	08	4.						
		13	5.						
		18	5.						
	2886	22	4.						
		27	5.						
		33	5.						
	2887	38	5.						
		42	4.						
		48	6.						



CORING LOG

FROM

EASTMAN CHRISTENSEN

16230 - 112 Avenue
Edmonton, Alberta, Canada T5M 2W1
Phone: (403) 451-0120/Telex 037-3502

CALGARY	(403) 264-7222
GRANDE PRAIRIE	(403) 532-2107
ST JOHN'S NFLD	(709) 726-1020
DARTMOUTH N.S.	(902) 465-5686

Date MAR. 1/89 Service Engineer LOGAN GRUNDEE

Company SHELL CANADA Contractor ATCO # 48

Well Name/No. SHELL ETAL ARROWHEAD B-41

Field _____ Hole Size (mm) 215.9

Diamond Bit Size (mm) 215.9 x 102 Bit No. 061549

Diamond Bit Type SCD-778 Core Barrel Size (mm) 171 x 102 x 18

Length (m) 19.94 No. C-28 Jar No. SPRING

Core No. FOUR Depth: From 2869.8 m To 2887.8 m

Total Metres Cored 18.0 Recovered 15.9

Hours 3:31 Formation Cored HUME / PRESQU'ILE

Description _____

Time Reaming To Bottom C.IRC. DRY BALL

Mud Wt. (kg/m³) 1115 r/min. 85

Mud Flowrate (m³/min.) 1.2

Bit Condition: Before 85 % After _____ %

FORM 331

(White) CUSTOMER COPY (Yellow) EDMONTON COPY (Pink) DISTRICT COPY

* Delete the column which doesn't apply

CORE DETAIL REPORT

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #: 06972
GRND: 512.48
DATE: 89/03/02 TIME: 8:30 EXAMINER: J.D/BELYK/MARION K.B.: 519.99
FORMATION: HUME CORE NO.: 4 INTERVAL: 2869.9 ' TO 2887.8 RECOVERY: 18.0 ' CORE SIZE: 114 mm

TYPE SDWLL SAMPLER: N/A SDWLL REC. - NO. OF SHOTS: N/A NO. RECOV: N/A NO. OF BOXES: 16

INTERVAL	ROCK DESCRIPTION	SHOWS %	HC ODOR	FLUOR. %	INTEN	CUT CLR	COLOR	FLUOR	AVG. #	SYM	SW REC	COMMENTS & FRAC/DIP STRUCT.
2869.80-2870.80	DOL: WH to LT GRY,I-I/III,CRYPTO to MED XLN,Btr,V CLN to SL	1	0	0	0	0	0	0	.143	?		Alternate Banding,Limited POR,TR PYBIT W XLN,TI MTRX
2870.80-2875.00	DOL: WH W SL LT GRY banding,I-I/III, CRYPTO to F XLN,C4,D2 POR,CLN to SL,	1	0	0	0	0	0	0	.143	?		OCC LGE VUGS Lined W Calcite And Quartz With Minor Pyrite Showing.STYLS Present With Extensive Fracturing
2875.00-2876.65	DOL: WH W MOD LT GRY COL,I-I/III, CRYPTO to V F XLN,B3 POR	1	0	0	0	0	0	0	.143	?		Feathered Banding,V Limited POR,TR PYBIT,OCC STYLS,V CLN
2876.65-2882.40	DOL: LT GRY TO WH,I-I/III,CRYPTO to MED XLN,B3,C5,D3 POR	1	0	0	0	0	0	5	.143	?		Extensive Vertical FRACS,At 2876.90 Huge Vug Present Lined With Calcite,Within Rare Large Vugs,Are Lined d With Calcite And Pyrite, Interval Has A Mottled appearance
2882.40-2883.50	DOL,LT.GRY-WH,I-I/III,CRYPTO-C,CLN Ctr-1 Dtr-1	0	0	0	0	0	0	0	0	?		vertical fracs,w/calcite and pyrite infilling.82.6-82.75m rare large vugs lined w/qtz and saddle dolomite xtals. Matrix has a spotted alterna ting appearance.
2883.50-2885.75	DOL,WH-GRY,I,MXLN-CRYPTO,CLN B3 C3 D4	0	0	0	0	0	0	0	0	?		good vuggy por present,larg ly overgrown with calcite, qtz,and saddle dolomite xtal s.vuggy por is of varying size and nonuniform in patte rn.
2885.75-2886.75	DOL,WH-GRY-BLK,I,C,SLI-MOD, Btr C6 D2	0	0	0	0	0	0	0	0	?		uniform porosity,with calc, qtz,and pyr xtal growth,some of the matrix appears carbon aceous,mottled to zebra color pattern.
2886.75-2887.16	DOL,WH-SLI.LT.GRY,I,C,CLN,Btr,C3,D2	0	0	0	0	0	0	0	0	?		extensive vertical and horiz fracs,large pyr deposits in vugs and fracs,vugs lined w/ qtz,calc,dolo,pyr.
2887.16-2887.80	DOL,WH-GRY,I,C,VERY,Btr,Ctr,D2	0	0	0	0	0	0	0	0	?		massive carbonaceous matrix, indication of qtz healed fracs,large vugs lined with calc,qtz,saddle dolo,pyr.

EXAMINER: J.D./SELLA/MAPION K.B.: 519.99

FORMATION: HUKE CORE NO.: 1 INTERVAL: 2869.3 TO 2887.8 RECOVERY: 18.0 CORE SIZE: 114

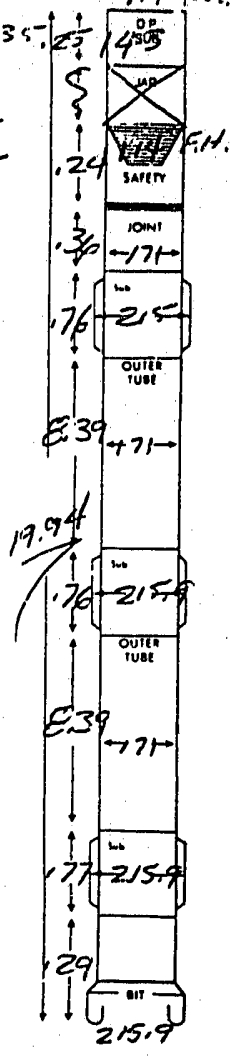
TYPE SDWLL SAMPLER: N/A SDWLL REC. - NO. OF SHOTS: N/A NO. RECOV: N/A NO. OF BOXES: 16

ROP GRAPH

DEPTH	1----------50----------100
2869.0	
2870.0	
2871.0	
2872.0	
2873.0	
2874.0	
2875.0	
2876.0	
2877.0	
2878.0	
2879.0	
2880.0	
2881.0	
2882.0	
2883.0	
2884.0	
2885.0	
2886.0	
2887.0	

START (m)	DEPTH (m)	TIME	MIN/METRE Actual	MIN/METRE Lost	Mud Report & Remarks	WEIGHT daN	r/min	PUMP SIZE 152×235 Pressure kPa	PUMP SIZE 152×235 Stroke mm
0.25	0.2								
0.50	0.4	17:56							
0.75	0.6	18:00	4			2-5000	60	6800	95
	0.8	04	4			4-5000	85	6800	95
1	1.0	09	4						
1.50	1.2	11	4						
1.75	1.4	16	4						
2.00	1.6	20	4						
2.25	1.8	24	4						
2.50	2.0	28	4						
2.75	2.2	32	4						
3.00	2.4	36	4						
3.25	2.6	41	5						
3.50	2.8	45	4						
3.75	3.0	48	3						
4.00	3.2	52	4						
4.25	3.4	56	4						
4.50	3.6	19:00	4						
4.75	3.8	05	5						
5.00	4.0	09	4						
5.25	4.2	13	4						
5.50	4.4	17	4						
5.75	4.6	21	4	3	TIGHTEN AIR LINE TO RATE CONTROL				
6.00	4.8	25	4			5000	85	6600	95
6.25	5.0	30	2						
6.50	5.2	33	3						
6.75	5.4	37	4						
7.00	5.6	40	3						
7.25	5.8	51	3	14	CANAL				
7.50	6.0	20:00	3						
7.75	6.2	03	3						
8.00	6.4	07	4						
8.25	6.6	10	3						
8.50	6.8	14	4						
8.75	7.0	18	4			5000	85	6600	95
9.00	7.2	21	3						
9.25	7.4	25	4						
	7.6	28	3						
	7.8	32	4						
10.00	8.0	36	4						
10.25	8.2	40	4						
10.50	8.4	45	5						
10.75	8.6	49	4						
11.00	8.8	53	4						
11.25	9.0	57	4			5000	85	6600	95
11.50	9.2	21:00	3						
11.75	9.4	04	4						
12.00	9.6	08	4						
12.25	9.8	13	5						
12.50	10.0	18	5						
12.75	10.2	22	4						
13.00	10.4	27	5						
13.25	10.6	34	7						
13.50	10.8	38	4						
13.75	11.0	42	4						
14.00	11.2	48	6						
14.25	11.4								
14.50	11.6								
14.75	11.8								
15.00	12.0								
15.25	12.2								
15.50	12.4								
15.75	12.6								
16.00	12.8								
16.25	13.0								
16.50	13.2								
16.75	13.4								
17.00	13.6								
17.25	13.8								
17.50	14.0								
17.75	14.2								
18.00	.4								
18	.6								
	.4.8								
	15.0								
	15.2								
	15.4								
	15.6								
	15.8								
	16.0								
	16.2								
	16.4								
	16.6								
	16.8								
	17.0								
	17.2								
	17.4								
	17.6								
	17.8								
	18.0								
	18.2								

* Delete the column which doesn't apply.



CORING LOG

FROM

EASTMAN CHRISTENSEN

16230 - 112 Avenue
Edmonton, Alberta, Canada T5M 2W1
Phone: (403) 451-0120/Telex 037-3502

CALGARY (403) 264-7222
GRANDE PRAIRIE (403) 532-2107
ST. JOHN'S, NFLD (709) 726-1020
DARTMOUTH, N.S. (902) 465-5696

Date MAR. 1/89 Service Engineer LOGAN GARDIPEE

Company SHELL CANADA Contractor ATCO # 48

Well Name/No. SHELL ET AL ARROWHEAD B-41

Field _____ Hole Size (mm) 215.9

Diamond Bit Size (mm) 215.9 x 102 Bit No. 061549

Diamond Bit Type SR-778 Core Barrel Size (mm) 171 x 102 x 18m

Length (m) 19.94 No. E-28 Jar No. STRING

Core No. FOUR Depth: From 2869.8m To 2887.8m

Total Metres Cored 18.0 Recovered 15.9

Hours 3:31 Formation Cored HOME PRESQUILE

Description _____

Time Reaming To Bottom CIRC. DROP BALL

Mud Wt. (kg/m³) 1115 r/min. 85

Mud Flowrate (m³/min.) 1.2

Bit Condition: Before 85 % After _____ %

FORM 331

(White) CUSTOMER COPY (Yellow) EDMONTON COPY (Pink) DISTRICT COPY

CORE DETAIL REPORT

WELLNAME: SHELL ET AL ARROWHEAD B-41 LOCATION: FIELD/AREA: WILDCAT C.W.O. #: D6972
GRND: 512.48
DATE: 89/03/02 TIME: 8:30 EXAMINER: J.D/BELYK/MARION K.B.: 519.99
FORMATION: HUME CORE NO.: 4 INTERVAL: 2869.8 m TO 2887.8 RECOVERY: 18.0 m CORE SIZE: 114 mm
TYPE SDWLL SAMPLER: N/A SDWLL REC. - NO. OF SHOTS: N/A NO. RECOV: N/A NO. OF BOXES: 16

INTERVAL	ROCK DESCRIPTION	SHOWS %	HC ODOR	FLUOR. %	INTEN	CLR	CUT COLOR	FLUOR	VUG. %	SYM	SW REC	COMMENTS & FRAC/DIP STRUCT.
2869.80-2870.80	DOL: WH to LT GRY,I-I/III,CRYPTO to MED XLN,Btr,V CLN to SL	1	0	0	0	0	0	0	.143	P		Alternate Banding,Limited POR,TR PYBIT W XLN,TI MTRX
2870.80-2875.00	DOL: WH W SL LT GRY banding,I-I/III, CRYPTO to F XLN,C4,D2 POR,CLN to SL,	1	0	0	0	0	0	0	.143	P		OCC LGE VUGS Lined W Calcite And Quartz With Minor Pyrite Showing.STYLS Present With Extensive Fracturing
2875.00-2876.65	DOL: WH W MOD LT GRY COL,I-I/III, CRYPTO to V F XLN,B3 POR	1	0	0	0	0	0	0	.143	P		Feathered Banding,V Limited POR,TR PYBIT,OCC STYLS,V CLN
2876.65-2882.40	DOL: LT GRY TO WH,I-I/III,CRYPTO to MED XLN,B3,C5,D3 POR	1	0	0	0	0	0	0	.143	P		Extensive Vertical FRACS,At 2876.90 Huge Vug Present Lined With Calcite,Within Rare Large Vugs,Are Lined d With Calcite And Pyrite, Interval Has A Mottled appearance
2882.40-2883.50	DOL,LT.GRY-WH,I-I/III,CRYPTO-C,CLN Ctr-1 Dtr-1	0	0	0	0	0	0	0	0	P		vertical fracs,w/calcite and pyrite infilling.82.6-82.75m rare large vugs lined w/qtz and saddle dolomite xtals. Matrix has a spotted alternating appearance.
2883.50-2885.75	DOL,WH-GRY,I,MXLN-CRYPTO,CLN B3 C3 D4	0	0	0	0	0	0	0	0	P		good vuggy por present,largly overgrown with calcite, qtz,and saddle dolomite xtals.vuggy por is of varying size and nonuniform in pattern.
2885.75-2886.75	DOL,WH-GRY-BLK,I,C,SLI-MOD, Btr C6 D2	0	0	0	0	0	5	0	0	P		uniform porosity,with calc, qtz,and pyr xtal grouth,some of the matrix appears carbonaceous,mottled to zebra colcr pattern.
2886.75-2887.16	DOL,WH-SLI..I.GRY,I,C,CLN,Btr,C3,D2	0	0	0	0	0	0	0	0	P		extensive vertical and horiz fracs,large pyr deposits in vugs and fracs,vugs lined w/ qtz,calc,dolo,pyr.
2887.16-2887.80	DOL,WH-GRY,I,C,VERY,Btr,Ctr,D2	0	0	0	0	0	0	0	0	P		massive carbonaceous matrix, indication of qtz healed fracs,large vugs lined with calc,qtz,saddle dolo,pyr.

EXAMINER: J.D. KELLY/MAPION K.B.: 519.99

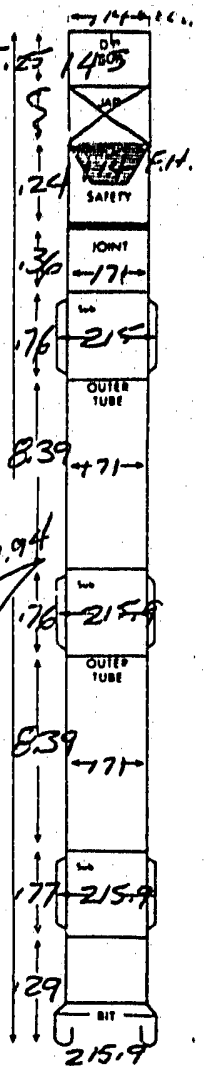
FORMATION: HUME CORE NO.: 1 INTERVAL: 2869.8 TO 2887.8 RECOVERY: 18.0 CORE SIZE: 114

TYPE SDWLL SAMPLER: N/A SDWLL REC. - NO. OF SHOTS: N/A NO. RECOV: N/A NO. OF BOXES: 16

ROP GRAPH

DEPTH	1----------50----------100
2869.0	
2870.0	
2871.0	
2872.0	
2873.0	
2874.0	
2875.0	
2876.0	
2877.0	
2878.0	
2879.0	
2880.0	
2881.0	
2882.0	
2883.0	
2884.0	
2885.0	
2886.0	
2887.0	

START (m)		DEPTH (m)	TIME	MIN / METRE Actual	MIN / METRE Lost	Mud Report & Remarks	WEIGHT (kg/m³)	r/min	PUMP SIZE 152 x 235 Pressure kPa	PUMP SIZE 152 x 235 Stroke mm
0.25	0.2	2869								
0.50	0.4		17:56							
0.75	0.6	2870	18:00	4			2-3000	60	6800	95
	0.8		04	4			4-5000	85	6800	95
	1.0		08	4						
1.00	1.2	2871	12	4						
1.25	1.4		16	4						
1.50	1.6		20	4						
1.75	1.8	2872	24	4						
2.00	2.0		28	4						
2.25	2.2		34	5						
2.50	2.4	2873	38	5		US 68 WT 1115	5000	85	6800	95
2.75	2.6		41	3						
3.00	2.8		46	4						
3.25	3.0	2874	48	3						
3.50	3.2		52	4						
3.75	3.4		56	4						
4.00	3.6	2875	19:00	4						
4.25	3.8		03	5						
4.50	4.0		09	4						
4.75	4.2	2876	13	4			5000	85	6600	95
5.00	4.4		17	4						
5.25	4.6		24	4	3	TIGHTEN AIR LINE TO RACK CLUTCH				
5.50	4.8	2877	28	4						
5.75	5.0		35	2						
6.00	5.2		43	3						
6.25	5.4	2878	47	4	1					
6.50	5.6		51	4						
6.75	5.8		57	3	14	CLEAN				
7.00	6.0	2879	20:00	3						
7.25	6.2		03	3						
7.50	6.4		07	4						
7.75	6.6	2880	10	3			5000	85	6600	95
8.00	6.8		14	4						
8.25	7.0		18	4						
8.50	7.2	2881	21	3						
8.75	7.4		25	4						
9.00	7.6		28	3						
9.25	7.8	2882	32	4						
9.50	8.0		36	4						
9.75	8.2		40	4						
10.00	8.4	2883	45	5						
10.25	8.6		49	4						
10.50	8.8		53	4						
10.75	9.0	2884	56	3			5000	85	6600	95
11.00	9.2		21:00	4						
11.25	9.4		04	4						
11.50	9.6	2885	08	4						
11.75	9.8		13	5						
12.00	10.0		18	5						
12.25	10.2	2886	22	4						
12.50	10.4		27	5						
12.75	10.6		34	7						
13.00	10.8	2887	38	4						
13.25	11.0		43	5						
13.50	11.2		48	5						
13.75	11.4									
14.00	11.6									
14.25	11.8									
14.50	12.0									
14.75	12.2									
15.00	12.4									
15.25	12.6									
15.50	12.8									
15.75	13.0									
16.00	13.2									
16.25	13.4									
16.50	13.6									
16.75	13.8									
17.00	14.0									
17.25	14.2									
17.50	14.4									
17.75	14.6									
18.00	14.8									
18	15.0									
	15.2									
	15.4									
	15.6									
	15.8									
	16.0									
	16.2									
	16.4									
	16.6									
	16.8									
	17.0									
	17.2									
	17.4									
	17.6									
	17.8									
	18.0									
	18.2									



CORING LOG

FROM

EASTMAN CHRISTENSEN

16230 - 112 Avenue
Edmonton, Alberta, Canada T5M 2W1
Phone: (403) 451-0120/Telex 037-3502

CALGARY	(403) 264-7222
GRANDE PRAIRIE	(403) 532-2107
ST. JOHN'S, NFLD.	(709) 726-1020
DARTMOUTH, N.S	(902) 465-5686

Date MAR 1/89 Service Engineer LOGAN GARDIPEE

Company SHELL CANADA Contractor ATCO # 48

Well Name/No. SHELL ET AL ARROWHEAD B-41

Field _____ Hole Size (mm) 215.9

Diamond Bit Size (mm) 215.9 x 102 Bit No. 061549

Diamond Bit Type SCI-778 Core Barrel Size (mm) 171 x 102 x 18m

Length (m) 19.94 No. C-28 Jar No. STRING

Core No. FOUR Depth: From 2869.8m To 2887.8m

Total Metres Cored 18.0 Recovered 15.9

Hours 3:31 Formation Cored HUME / RESGOUCHE

Description _____

Time Reaming To Bottom CIRC. DROP BALL

Mud Wt. (kg/m³) 1115 r/min. 85

Mud Flowrate (m³/min.) 1.2

Bit Condition: Before 85 % After _____ %

* Delete this column where crossed out apply.

FORM 331 (White) CUSTOMER COPY (Yellow) EDMONTON COPY (Pink) DISTRICT COPY

C. LITHOLOGY

* Geological technical log
* Geological sample descriptions

E. BIOSTRATIGRAPHIC DATA

* Palynology & Micropaleontology studies were not performed during the course of the well.

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: SHELL ET AL ARRROWHEAD B-41 DATE:

LOCATION: C.W.O. #: JAK22

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50 CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
500		TYPE =	3.0						SH,LT.-MED GRY,MED-FRM,SLTY,BLKY
		WOB = 19000	3.0						SS,TAN,VF,SR,MWS,CALC,CONS,NVP
		RPM = 60	3.0						
		SPM = 135	2.0						
		P.P.= 13000	2.0						
505			2.0						SH,LT.-MED GRY,MED-FRM,SLTY,BLKY
			3.0						SS,TAN,VF,SR,MWS,CALC,CONS,NVP
			2.0						
			2.0						
			2.0						
510			3.0						SH,LT.-MED GRY,MED-FRM,SLTY,BLKY
			2.0						TR SS,TAN,VF,SR,MWS,CALC,CONS,NVP
			2.0						
			2.0						
			2.0						
515			2.0						SH,LT.-MED GRY,MED-FRM,SLTY,BLKY
			2.0						TR SS,TAN,VF,SR,MWS,CALC,CONS,NVP
			4.0						
			2.0						
			2.0						
520			2.0						SH,LT.-MED GRY,MED-FRM,SLTY,BLKY
			2.0						TR SS,TAN,VF,SR,MWS,CALC,CONS,NVP
			2.0						
			2.0						
			2.0						
525			2.0						SH,MED GRY,MED-FRM,SLTY,BLKY
			2.0						
			2.0						
			2.0						
			2.0						
530			2.0						SH,MED GRY,MED-FRM,SLTY,BLKY
			2.0						
			2.0						
			2.0						
			2.0						
535			2.0						SH,MED GRY,MED-FRM,SLTY,BLKY
			2.0						
			2.0						
			2.0						
			2.0						
540			2.0						SH,MED GRY,MED-FRM,SLTY,BLKY
			2.0						
			2.0						
			2.0						
			3.0						
545			3.0						SH,MED GRY,MED-FRM,SLTY,BLKY
			3.0						
			3.0						
			3.0						
		MIDNIGHT DEPTH	2.0						
550		= 550M							SH,MED GRY,MED-FRM,SLTY,BLKY
		START DRILLING							
		8.5 INCH HOLE							
		AT 550M.							

C.W.O. #: JAK22

Location: SHELL ET AL ARROWHEAD B-41

DEPTH	TOPS	BIT/TECH DATA	ROP 1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
555									
560			2.0						SH,MED GRY,SOFT-MED,SLTY,PLTY-BLKY
			2.0						SS,TAN,VF,SR,MWS,CALC-SIL,CONS,NVP
			2.0						TR GLAUC IN SS
			2.0						
			2.0						
565		TYPE = ATJ-22	2.0						SH,MED GRY,MED,SUB LITHGR,PLTY-BLKY
		WOB = 10000	2.0						
		RPM = 70	2.0						
		SPM = 110	2.0						
		P.P.= 12000	3.0						
570			2.0						SH,MED GRY,MED,SUB LITHGR,PLTY-BLKY
			2.0						
			2.0						
			2.0						
			2.0						
575			2.0						SH,MED GRY,MED,SUB LITHGR,PLTY-BLKY
			2.0						
			2.0						
			3.0						
			2.0						
580			2.0						SH,MED GRY,MED,SUB LITHGR,PLTY-BLKY
			2.0						
			2.0						
			2.0						
			3.0						
585			2.0						SH,MED GRY,MED,SUB LITHGR,PLTY-BLKY
			2.0						
			3.0						
			2.0						
			2.0						
590		CORE POINT #1	2.0						SH,MED GRY,MED,SUB LITHGR,PLTY-BLKY
		= 597m	2.0						
			2.0						
			2.0						
			2.0						
595			2.0						
			2.0						
		CORE NO.1							SEE CORE DESCRIPTION
		597.0-615.0							
		CUT 18.0							
600		REC 18.0							
									SEE CORE DESCRIPTION
605									
									SEE CORE DESCRIPTION
610									
	Kbq								
									SEE CORE DESCRIPTION

Pellname: SHELL ET AL ARROWHEAD B-41 Location: C.M.O. #1 JAMES

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------5	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
615		* CORE NO.2 *								
		615.0-633.15								
		CUT 18.0								SEE CORE DESCRIPTION
		REC 18.15								
620		DST #2 621-632								
		IHP = 6309								
		PFP = 3724								SEE CORE DESCRIPTION
		ISI = 4917								
		FFP = 4320								
625		FSI = 4718								
		FHP = 6309				2				
		RECOVERED MUDDY								SEE CORE DESCRIPTION
		BRACKISH FRESH								
		H2O, NO VOLUME								
630		RECORDED.								
										SEE CORE DESCRIPTION
		DST #1 633-641	4.0							
		IHP = 6309	4.0							
635		FPF = 2928	4.0							SS,CLR-WH,F-C,PS,SIL,UNCONS-LOOSE,NVP
		ISI = 4718	5.0			1				SH,MED.GRY,SLTY,BLKY
		FFP = 4320	8.0							TR COAL
		FSI = 4718	10.0							
		FHP = 6309	8.0							
640		RECOVERED 353m	8.0							SS,CLR-WH,F-C,PS,SIL,UNCONS-LOOSE,NVP
		SALT H2O/MUD	2.0							SH,MED.GRY,SLTY,BLKY
			3.0							TR COAL
			3.0							** EXTENSIVE YELLOW FLUOR
			4.0							NO CUT
645			4.0							LMST,GRY-BUFF,I,VF,SLI-MOD.ARG
			4.0							SH,MED.GRY,SLTY,BLKY
			4.0							
			2.0							
			5.0							
650			2.0							LMST,GRY-TAN-BUFF,I,VF,SLI-MOD.ARG
	Md		6.0							SH,MED.GRY,SLTY,BLKY
	@652m		4.0							
			5.0							
			5.0							
655			16.0							LMST,CRM-GRY-BRN,I,VF,SLI-MOD.ARG
			12.0							SH,MED.GRY,SLTY,BLKY
			14.0							
			12.0							
			12.0							
660			10.0							LMST,CRM-GRY-BRN,I,VF,SLI-MOD.ARG
			6.0							
			6.0							
			6.0							
			7.0							
665		TYPE = HP51A	7.0							LMST,CRM-GRY-BRN,I,VF,SLI-MOD.ARG
		WOB = 10000	7.0							SH,DK.GRY,SLTY,BLKY
		RPM = 60	7.0							LMST FOSSUS IN PART
		SPM = 110	8.0							
		P.P.= 15000	16.0							
670			22.0							LMST,CRM-GRY-BRN,I,VF,SLI-MOD.ARG
			24.0							TR SH,DK.GRY,SLTY,BLKY
			18.0							LMST FOSSUS IN PART
			18.0							
			18.0							

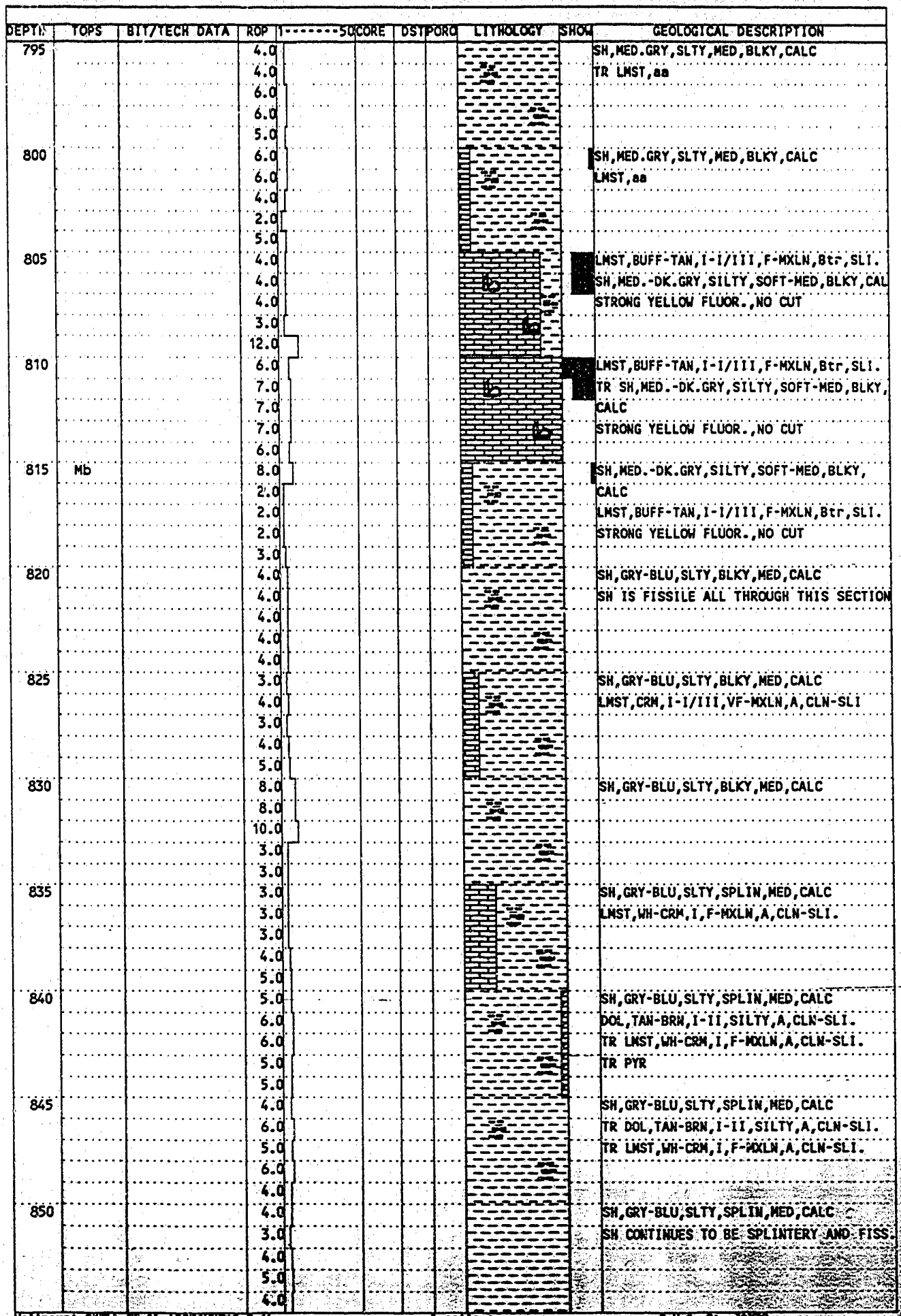
Wellname: SHELL ET AL ARKONA/WEST B-41 Location: C.N.O. #: 3833

DEPTH	TOPS	BIT/TECH DATA	ROP	SOCORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
675			14.0						LMST,CRM-GRY-BRN,I,VF,SLI-MOD.ARG
			12.0						SH,DK.GRY,SLTY,BLKY
			18.0						LMST FOSSUS IN PART
			12.0						
			12.0						
680			14.0						LMST,CRM-GRY-BRN,I,VF,SLI-MOD.ARG
			10.0						SH,DK.GRY,SLTY,BLKY
			10.0						LMST FOSSUS IN PART
			8.0						TR PYR
			6.0						TR CHT
685			6.0						SH,DK.GRY,SLTY,BLKY
			6.0						LMST,CRM-BUFF,I,VF-MXLN,A,SLI
			4.0						LMST FOSSUS IN PART
			2.0						TR PYR
			2.0						TR CHT
690			10.0						LMST,GRY-CRM,I,MXLN,A,SLI
			8.0						SH,DK.GRY,SLTY,BLKY
			8.0						TR PYR
			10.0						LMST FOSSUS IN PART
			8.0						PYRITE DISSEMINATED IN LMST
695			10.0						LMST,CRM-GRY,I,tr I/III,VF-MXLN,A,SLI
			14.0						SH,DK.GRY,SLTY,BLKY
			4.0						TR COAL
			4.0						TR PYR
			16.0						TR CHT
700			15.0						LMST,CRM-BRN,VF-MXLN,A,I,SLI-MOD
			8.0						SH,GRY-BLUE,SLTY,MED,BLKY-FLKY
			10.0						TR CHT
			8.0						
			14.0						
705			14.0						SH,GRY-BLUE,SLTY,MED,BLKY-FLKY
			12.0						LMST,CRM-BRN,VF-MXLN,A,I,SLI-MOD
			10.0						TR CHT
			10.0						
			10.0						
710			4.0						SH,GRY-BLUE,SLTY,MED,BLKY-FLKY
			3.0						LMST,CRM-BRN,VF-MXLN,A,I,SLI-MOD
			8.0						TR CHT
			6.0						TR PYR
			12.0						
715			8.0						SH,LT.GRY,SLTY,MED,PLTY
			12.0						LMST,CRM-BUFF,I,MXLN,A,SLI
			6.0						TR CHT
			10.0						
			7.0						
720			5.0						SH,LT.GRY,SLTY,MED,PLTY
			5.0						LMST,CRM-BUFF,I,MXLN,A,SLI
			7.0						TR CHT
			5.0						
			8.0						
725			10.0						SH,LT.GRY,SLTY,MED,PLTY
			4.0						
			4.0						
			3.0						
			4.0						
730			4.0						SH,LT.GRY,SLTY,MED,PLTY,CALC
			4.0						
			4.0						
			5.0						
			5.0						

Wellname: SHELL ET AL ARKOOMERAH B-1 Location: C.M.S. 61 30152

DEPTH	TOPS	BIT/TECH DATA	ROP	1------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
735			4.0							SH,LT.GRY,SLTY,MED,PLTY,CALC
			4.0							
			4.0							
			4.0							
			3.0							
740			3.0							SH,LT.GRY,SLTY,MED,PLTY,CALC
			3.0							
			3.0							
			3.0							
			4.0							
745			4.0							SH,LT.GRY,SLTY,MED,PLTY,CALC
			4.0							
			4.0							
			4.0							
			4.0							
750			4.0							SH,LT.GRY,SLTY,MED,PLTY,CALC
			5.0							
			4.0							
			5.0							
			5.0							
755			4.0							SH,LT.GRY,SLTY,MED,PLTY,CALC
			4.0							
			4.0							
			4.0							
			4.0							
760			4.0							SH,LT.GRY,SLTY,MED,PLTY,CALC
			5.0							
			5.0							
			5.0							
			5.0							
765			6.0							SH,LT.GRY,SLTY,MED,PLTY,CALC
			5.0							
			5.0							
			4.0							
			4.0							
770		TYPE = HP51A	4.0							SH,LT.GRY,SLTY,HARD,PLTY-BLKY,CALC
		WOB = 16-17,000	4.0							
		RPM = 70	4.0							
		SPM = 220	6.0							
		P.P.= 17000	6.0							
775			6.0							SH,LT.GRY,SLTY,HARD,PLTY-BLKY,CALC
			6.0							
			4.0							
			4.0							
			4.0							
780			4.0							LMST,CRM-BRN,I,MXLN,A,SLI.-MOD
			5.0							SH,MED.-DK.GRY,SLTY,HRD,BLKY,CALC
			5.0							
			4.0							
			5.0							
785			4.0							SH,MED.GRY,SLTY,HRD,BLKY,CALC
			4.0							
			4.0							
			4.0							
			5.0							
790	Mp		12.0							SH,MED.GRY,SLTY,MED,BLKY,CALC
										TR LMST,aa

Wellname: SHELL ET AL ARBUCKLE 1-41 Location: C.R.C. 8: JAKE



Wellname: SHELL, ET AL ARMSTRONG 8-41 Location: C.M.S., Gt. Salt

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
855			4.0							SH,GRY-BLU,SLTY,SPLIN,MED,CALC
			4.0							LMST,CRM-WH,I,MXLN,A,CLN-SLI
			4.0							FOSSUS
			4.0							
			8.0							
860			6.0							DOL,TAN-BRN,I-II,SILTY,A,CLN-SLI.
			6.0							SH,GRY-BLU,SLTY,SPLIN,MED,CALC
			6.0							LMST,CRM-WH,I,MXLN,A,CLN-SLI
			4.0							
			5.0							
865			5.0							DOL,TAN-BRN,I-II,SILTY,A,CLN-SLI.
			4.0							SH,GRY-BLU,SLTY,SPLIN,MED,CALC
			8.0							LMST,CRM-WH,I,MXLN,A,CLN-SLI
			6.0							
			5.0							
870			10.0							LMST,CRM-WH,I,MXLN,A,CLN-SLI
			6.0							SH,GRY-BLU,SLTY,SPLIN,MED,CALC
			10.0							DOL,TAN-BRN,I-II,SILTY,A,CLN-SLI.
			8.0							FOSSUS
			10.0							
875			12.0							LMST,WH-CRM,I-I/III,F-MXLN,A,CLN-SLI.
			10.0							SH,LT.GRY,SLTY,SOFT-MED,FLKY-BLKY
			12.0							DOL,TAN-BRN,I-II,SILTY,A,CLN-SLI.
			13.0							TR PYR
			14.0							
880			12.0							SH,LT.GRY,SLTY,SOFT-MED,FLKY-BLKY
			10.0							LMST,WH-CRM,I-I/III,F-MXLN,A,CLN-SLI.
			10.0							DOL,TAN-BRN,I-II,SILTY,A,CLN-SLI.
			10.0							TR PYR
			12.0							
885			10.0							SH,LT.GRY-GRN,SLTY,SOFT-MED,FLKY-BLKY
			5.0							LMST,WH-CRM,I-I/III,F-MXLN,A,CLN-SLI.
			10.0							TR DOL,TAN-BRN,I-II,SILTY,A,CLN-SLI.
			18.0							TR PYR
			16.0							
890		TYPE = HP51A	16.0							SH,LT.GRY-GRN,SLTY,SOFT-MED,FLKY-BLKY
		WOB = 17000	12.0							LMST,WH-CRM,I-I/III,F-MXLN,Btr,CLN-SLI
		RPM = 60	5.0							TR DOL,TAN-BRN,I-II,SILTY,A,CLN-SLI.
		SPM = 220	5.0							TR PYR
		P.P.= 17500	6.0							
895			10.0							SH,GRY-BLU,FRM,SLTY,SPLINT
			6.0							TR LMST,WH-CRM,I-I/III,F-MXLN,Btr,CLN-
			4.0							TR PYR
			4.0							
			4.0							
900			3.0							SH,GRY-BLU,FRM,SLTY,SPLINT
			3.0							TR LMST,WH-CRM,I-I/III,F-MXLN,Btr,CLN-
			3.0							TR PYR
			4.0							
			3.0							
905			5.0							SH,GRY-BLU,FRM,SLTY,SPLINT
			6.0							TR LMST,WH-CRM,I-I/III,F-MXLN,Btr,CLN-
			4.0							TR PYR
			4.0							
			4.0							
910			3.0							SH,GRY-BRN,FIS-BLKY,HRD,SUB LITHGR
			6.0							
			6.0							
			6.0							
			6.0							

Wellname: SHELL ET AL ARRINGTON B-41 Location: C.M.S. #1 JOB#

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
915			6.0							SH,GRY-BRN,FIS-BLKY,HRD,SUB LITHGR
			6.0							-SLTY
			6.0							
			6.0							
			6.0							
920			8.0							SH,GRY-BRN,FIS-BLKY,HRD,SUB LITHGR
			9.0							-SLTY
			8.0							
			8.0							
			8.0							
925			8.0							SH,GRY-BRN,FIS-BLKY,HRD,SUB LITHGR
			6.0							-SLTY
			2.0							
			4.0							
			6.0							
930			6.0							SH,GRY-BRN,FIS-BLKY,HRD,SUB LITHGR
			6.0							-SLTY
			6.0							
			10.0							
			4.0							
935			8.0							SH,GRY-BRN,FIS-BLKY,HRD,SUB LITHGR
			8.0							-SLTY
			8.0							
			10.0							
			10.0							
940			8.0							SH,GRY-BRN,FIS-BLKY,HRD,SUB LITHGR
			8.0							-SLTY
			10.0							
			8.0							
			4.0							
945			6.0							SH,GRY-BRN,FIS-BLKY,HRD,SUB LITHGR
			8.0							-SLTY
			6.0							
			8.0							
			8.0							
950			8.0							SH,GRY-BRN,FIS-BLKY,HRD,SUB LITHGR
			8.0							-SLTY
			8.0							
			8.0							
			8.0							
955			3.0							SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			4.0							SLTY
			4.0							
			4.0							
			4.0							
960			4.0							SH,GRY-BRN,FIS-BLKY,HRD,SUB LITHGR
			4.0							-SLTY
			3.0							
			4.0							
			4.0							
965			4.0							SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			4.0							SLTY
			3.0							
			2.0							
			3.0							
970			3.0							SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			3.0							SLTY
			3.0							
			4.0							
			4.0							

Wellname: SHELL ET AL ARBUCKLEAD 5-4S Location: C.W.S. of JAICE

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50 CORE	DS	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
975			3.0						SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			3.0						SLTY
			3.0						
			4.0						
			4.0						
980			4.0						SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			5.0						SLTY
			5.0						DOL,BRN-TAN,I,SILTY,VF-F,A,SLI-MOD
			4.0						
			4.0						
985			3.0						SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			3.0						SLTY
			2.0						
			2.0						
			2.0						
990			2.0						SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			3.0						SLTY
			3.0						
			3.0						
			3.0						
995			3.0						SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			2.0						SLTY
			2.0						
			2.0						
			2.0						
1000			3.0						SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			3.0						SLTY
			3.0						
			3.0						
			2.0						
1005			2.0						SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			2.0						SLTY
			2.0						
			2.0						
			2.0						
1010			3.0						SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			3.0						SLTY
			3.0						
			3.0						
			3.0						
1015			3.0						SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			3.0						SLTY
			3.0						
			3.0						
			2.0						
1020			2.0						SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			2.0						SLTY
			2.0						
			2.0						
			2.0						
1025			2.0						SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			2.0						SLTY
			2.0						
			2.0						
			2.0						
1030			3.0						SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-
			3.0						SLTY
			3.0						
			3.0						
			3.0						

Oilcase: SHELL ET AL ARROWHEAD B-41 Location: C.M.S. 8: JAKE

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1035			3.0							SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-SLTY
			3.0							
			3.0							
			3.0							
			3.0							
1040			3.0							SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-SLTY
			3.0							
			3.0							
			3.0							
			3.0							
1045			3.0							SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-SLTY
			4.0							
			6.0							
			6.0							
1050										SH,LT.GRY-BRN,MED,FIS-BLKY,SUB LITHGR-SLTY
1055		* air drilling commences to a depth of 2504 M which results in poor samples								** see mud log for further sample discription
1060		* refer to the mud log for detailed tech data								
1065										
1070										
1075										
1080										
1085										
1090										

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.M.S. 81 JAMES

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1095										
1100										
1105										
1110										
1115										
1120										
1125										
1130										
1135										
1140										
1145										
1150										

Wellname: SHELL ET AL ARROWHEAD D-41 Location: C.M.S. 81 - JUNE

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1155										
1160										
1165										
1170										
1175										
1180										
1185										
1190										
1195										
1200										
1205										
1210										

Wellname: SHELL ET AL ARKOMEAS B-11 Location: C.H.G. 8: JAKE

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------SOCORE	DSTPORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1215								
1220								
1225								
1230								
1235								
1240								
1245								
1250								
1255								
1260								
1265								
1270								

Wellname: SHELL ET AL ARMOURHEAD B-41 Location: C.M.S. St. JOHNS

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------5	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1275										
1280										
1285										
1290										
1295										
1300										
1305										
1310										
1315										
1320										
1325										
1330										

Wellname: SHELL ET AL ARBUCKLE 5-11 Location: C.M.D. 8: JAKE2

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1335										
1340										
1345										
1350	-Me									SH; BLKSH-BRN,some GRY,F-TEX,HD,SL FISS,TR CHT,TR PYR * for further detail refer to the mud-logging strip chart
1355										
1360										
1365										
1370	-Dkc									DOL; SL LMY,CRYPTO,CRM to SL GRY,I,NVP ,SL-MOD ARG,W intervals of DOL/LMST and SHY DOL * for further detail refer to the mud-logging strip chart
1375										
1380										
1385										
1390										

Wellname: SHELL ET AL ARROWHEAD F-41 Location: C.N.O. #: 34332

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1395										
1400										
1405										
1410										
1415										
1420										
1425										
1430										
1435										
1440										
1445										
1450										

Wellname: SHELL ET AL ARBOCREEK 3-11 Location: C.N.O. #: JAR22

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1455										
1460										
1465										
1470										
1475										
1480										
1485										
1490										
1495										
1500										
1505										
1510										

Wellname: SHELL ET AL ARMSTRONGHEAD B-41 Location: C.M.S. #: 3422

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1515										
1520										
1525										
1530										
1535										
1540										
1545										
1550										
1555										
1560										
1565										
1570										

Wellname: SHELL ET AL ARRINGTON B-41 Location: C.H.O. S: 38X13

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1575										
1580										
1585										
1590										
1595										
1600										
1605										
1610										
1615										
1620										
1625										
1630										

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.H.O. 81 [illegible]

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1635										
1640										
1645										
1650										
1655										
1660										
1665										
1670										
1675										
1680										
1685										
1690										

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.M.S. 81 JAKES

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1695										
1700										
1705										
1710										
1715										
1720										
1725										
1730										
1735										
1740										
1745	-Dte									SH; DK BLK W some SL GRY,F/WXY TEX, CALRUS,HD,BLKY BDG
										* for further detail refer to the mud-logging strip chart
1750										

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.M.O. 6: JAMES

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1755										
1760	-Dtr									LMST; LT-MED BRN,I,CRYPTO,MOD ARG,W TR PYR,NVP,sequences of DOL/LMST and SH/DOL * for further detail refer to the mud-logging strip chart
1765										
1770										
1775										
1780										
1785										
1790										
1795										
1800										
1805										
1810										

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.N.O. 81: JAN82

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1815										
1820										
1825										
1830										
1835										
1840										
1845										
1850	-Dks									SLTST; GRY-GRY/GRN,SL LMY,GEN rough TEX,BLKY TYP BDG * for further detail refer to the mud-logging strip chart
1855										
1860										
1865										
1870										

Wellname: SHELL ET AL ARKOOMERA 5-41 Location: C.M.G. 8: JAKE

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1875										
1880	-Dfs									LMST; BUFTAN,CRYPTO,I,SL-MOD ARG W SH/ SLTST/MED GRY-GRY BRN,I,CRYPTO,DOL stringers * for further detail refer to the mud-logging strip chart
1885										
1890										
1895										
1900										
1905										
1910										
1915										
1920										
1925										
1930										

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.M.O. 8: JAN82

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50 CORE	DST/PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1935								
1940								
1945								
1950								
1955								
1960								
1965								
1970								
1975								
1980								
1985								
1990								

Wellname: SHELL ET AL ARMOURHEAD D-41 Location: C.M.G. #: 3422

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
1995										
2000										
2005										
2010										
2015										
2020										
2025										
2030										
2035										
2040										
2045										
2050										

Wellname: SHELL ET AL ARBUCKLE B-41 Location: C.M.S. 81 34S2E

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2055										
2060										
2065										
2070										
2075										
2080										
2085										
2090										
2095										
2100										
2105										
2110										

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.N.O. #: 30433

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2115										
2120										
2125										
2130										
2135										
2140										
2145										
2150										
2155										
2160										
2165										
2170										

Wellname: SHELL ET AL ARKOOMERA 5-41 Location: C.W.O. #: 34122

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2175										
2180										
2185										
2190										
2195										
2200										
2205										
2210										
2215										
2220										
2225										
2230										

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.M.S. 81 JAZZ

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2235										
2240										
2245										
2250										
2255										
2260										
2265										
2270										
2275										
2280										
2285										
2290										

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.M.O. #: JAN22

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2295										
2300										
2305										
2310										
2315										
2320										
2325										
2330										
2335										
2340										
2345										
2350										

Wellname: SHELL ET AL ARBROATH P-31 Location: C.W.O. #: JAR22

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2355										
2360										
2365										
2370										
2375										
2380										
2385										
2390										
2395										
2400										
2405										
2410										

Wellname: SHELL ET AL ARRENGUEAD B-41 Location: C.N.O. 81 JAKE

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2415										
2420										
2425										
2430										
2435										
2440										
2445										
2450										
2455										
2460										
2465										
2470										

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.N.O. #: JAK22

DEPTH	TOPS	BIT/TECH DATA	ROP	1------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2475										
2480										
2485										
2490										
2495										
2500										SH: LT to MED GRY,W ahint of GRN and BRN,F TEX,SFT to SLLY firm,BLKY but SLLY FIS,SLLY CALRUS
2505		-NB#12,HP53A 215.9mm M HRS DS @2505	15.0 15.0							SH: AA
2510		2.0 DEG, S61.0W DEN = 1080 VIS = 58 WL = 8.0 pH = 10.0	15.0 14.0 13.0 12.0 15.0							SH: AA
2515		WOB= 15-17000 RPM= 60 SPM= 60/60 P.P- 13500	14.0 14.0 14.0 15.0 14.0							SH: AA
2520			15.0 14.0 14.0 14.0 14.0							SH: AA
2525			14.0 14.0 14.0 14.0 14.0							SH: MED to DK GRY W SL COL of GRN INCR BLK,F TEX,SFT,BLKY but SLLY FIS,SLLY CALRUS
2530			14.0 14.0 14.0 14.0					-P-		SH: AA,but 50/50 DK GRY and BLK W TR of GRN COL TR: PYR
	-Dmsk		14.0							

Wellname: SHELL ET AL ARBUCKLE 5-41 Location: C.M.S. 6: Jul88

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2535			11.0							SH: AA
			14.0							
			14.0							
			13.0							
			13.0							
2540			14.0							SH: AA
			12.0							
			12.0							
			13.0							
			13.0							
2545			13.0							SH: AA
			13.0							TR: PYR
			12.0					P		
			12.0							
			12.0							
2550			12.0							SH: MED to DK GRY,BLK,W SL BRN and GRN
			12.0							COL,F TEX,SFT to firm,BLKY but SLLY
			10.0					P		FIS,V CALRUS W TR of PYR
		I BELIEVE THAT	12.0							LMST: BLK,DK BRN,DNS TYP I,NVP,SLLY
	-Dsp	FROM 2554 THE	10.0							ARG,CRYPTO
2555		LITHOLOGY IS	11.0							SH: AA
		PURE LIMESTONE	11.0							LMST: AA
		SHALE BY VOLUME	10.0							
		IDICATED IS A	10.0							
		RESULT OF A	10.0							
2560		SLOUGHING	10.0							SH: AA
		FROM THE SHALES	9.0							LMST: AA
		ABOVE	9.0					P		TR: PYR
			10.0							
			10.0							
2565			10.5							SH: MED to DK GRY,BLK,W SL BRN and GRN
			10.5							COL,F TEX,SFT to firm,BLKY but SLLY
			10.5							FIS,V CALC,TR VNG CALC,5% CALC NODS
			10.5							LMST: BLK,DK BRN,DNS TYP I,NVP,SLLY
			10.5							to MOD ARG,CRYPTO
2570			10.5							SH: AA,but 2% CALC NODS
			10.5							LMST: AA
		-DS 2.3DEG	10.5							
		N 89.8 W	10.5							
			10.5							
2575			10.5							SH: AA,but TR CALC NODS,more VNG CALC
			10.5							LMST: AA
			10.5							
			10.5							
			10.5							
2580			10.5							SH: AA
			10.5							LMST: AA
			10.5							
			10.5							
			10.5							
2585			10.5							SH: AA
			10.5							LMST: AA
			10.5					P		TR: PYR
			10.5							
			10.5							
2590			10.5							
			10.5							SH: AA
			10.5					P		LMST: AA
			10.5							TR: PYR
			10.5							

Wellname: SHELL ET AL ARKONOMAD B-41 Location: C.M.O. #: 3033

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2595			10.5							SH: MED to DK GRY,BLK,W SL BRN and GRN
			10.5							COL,F TEX,SFT to firm,BLKY but SLLY
			10.5					P		FIS,V CALC,TR VNG CALC and PYR
			10.5							LMST: BLK,DK BRN,DNS TYP I,NVP,SLLY
			10.5							ARG,CRYPTO
2600			10.5							SH: MED to DK GRY,BLK,W SL GRN hint
			10.5							SFT to firm,BLKY but SLLY FIS,SLLY
			10.5							CALRUS
			10.5							LMST: BLK,DK BRN,I,NVP,SLLY ARG,CRYPTO
			10.5							,W VNG CALC
2605			10.5							SH: AA
			10.5							LMST: AA
			10.5					P		TR: PYR
			10.5							
			10.5							
2610			9.5							SH: AA
			9.5							LMST: AA
			9.5							
			9.5							
			10.5							
2615			10.5							SH: AA
			10.5							LMST: AA
			10.5							
			10.5							
			10.5							
2620			10.5							SH: AA
			10.5							LMST: AA
			10.5							
			10.5							
			10.5							
2625			10.5							SH: AA
			10.5							LMST: AA
			10.5							
			10.5							
		-DS 2.0, N70W	10.5							
2630			10.5							SH: AA
			10.5							LMST: AA
			10.5					P		TR: PYR
			10.5							
			10.5							
2635			10.5							SH: AA
			10.5							LMST: AA
			10.5							TR: PYBIT
			10.5							
			10.5							
2640			10.5							SH: MED to DK GRY,BLK,W SL BRN and GRN
			12.0							COL,F TEX,SFT to firm,BLKY but SLLY
			10.5							FIS,SLLY CALRUS
			12.0							LMST: BLK,DK BRN,I,MXLN to CRYPTO,NVP,
			10.5							SLLY ARG W VNG CALC and TR PYBIT
2645			10.5							SH: AA
			10.5							LMST: AA
			10.5							TR: PYBIT
			10.5							
			10.5							
2650			10.5							SH: AA
			10.5							LMST: AA
			10.5							TR: PYBIT
			10.5							
			10.5							

Wellname: SHELL ET AL ARKOOMIAK B-41 Location: C.M.O. #: 3433

DEPTH	TOPS	BIT/TECH DATA	ROP	1------50 CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2655			10.5						
			10.5						SH: AA
			10.5						LMST: AA
			10.5						TR: PYBIT
			10.5						
2660			10.5						SH: AA, but TR pieces W a BLUSH GRN
			10.5						COL and TR of PYR
			10.5						LMST: AA
	•DWt		10.5						
			13.0						
2665			16.5						SH: MED GRY,BLK,BRN,TR BLUSH GRN,F TEX
			10.5						BLKY,SLLY,FIS or PLTY,SL to MOD CALRUS
			10.5						LMST: WH to LT TAN,DNS II-II/III,DK
			10.5						BRN,(I) W VNG CALC,CLN to SLLY CALC,
			10.5						MXLN to CRYPTO,NVP,W TR PYBIT
2670			10.5						SH: like AA the BLUSH GRN has ingrowth
			10.5						PYR
			10.5						LMST: AA,INCR in WH COL
			10.5						
			10.5						
2675			12.0						SH: MED to DK GRY,BLK,F TEX,BLKY,SLLY
			10.5						FIS or PLTY
			10.5						LMST: WH to LT TAN,DNS II-II/III,V CLN
			10.5						MXLN to CRYPTO,NVP
			12.0						
2680			12.0						SH: AA
									LMST: AA W TR PYBIT
2685									SH: AA
		•DS 2.5. N50W							LMST: AA W TR PYBIT
2690									SH: AA
									LMST: AA W TR PYBIT
2695									SH: AA
									LMST: AA W TR PYBIT
									TR: PYR
2700									SH: DK GRY to BLK,F TEX,SFT to firm,
									BLKY SLLY PLTY
									LMST: AA,SLLY ARG
									TR: SLTST,
2705									SH: AA
									LMST: AA
2710		WOB = 15-17000	13.0						SH: BLK,DK GRY,F TEX,SFT to MD,BLKY,
		RPM = 50/60	13.0						SLLY FIS,SLLY CALRUS,TR FOSS(crinoid)
		SPM = 60/60	13.0						LMST: WH,LT to DK GRY,TR BRN,MXLN
		P.P = 14000	13.0						to CRYPTO,WH to BLK II,II/III,V CLN to
		DEN = 1120	12.0						MOD ARG,W TR VNG CALC,NVP

Wellname: SHELL ET AL ARBUCKLE D-41 Location: C.H.S. 8: 20E2

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2715		VIS = 54	13.0							SH: AA
		WL = 8.4	12.0							LMST: AA
		pH = 9.5	13.5							
			14.5							
			13.0							
2720			13.0							SH: AA
			13.0							LMST: AA
			13.0							
			14.5							
			14.5							
2725			14.5							SH: AA
		jet velocities	14.5							LMST:AA
		are pulverizing	14.5							***high nozzle velocities are
		carbonate	14.5							pulverizing the carbonate samples**
		samples	14.5							***severe simpson soughing***
2730			15.5							SH: AA
		severe simpson	15.5							LMST: AA
	-Dh	slouching	15.5					P		TR: PYR
			22.5							
			15.5							
2735			15.5							SH: AA
			15.5							LMST: AA
			15.5							
			15.5							
			15.5							
2740			15.5							SH: AA
			15.5							LMST: AA
			15.5							
			15.5							
			15.5							
2745			15.5							SH: DK GRY,BLK,F-MED TEX,BLKY,SLLY
			16.5							CALRUS
			16.5					P		LMST: WH,CRM,BRN,MXLN to CRYPTO,I/III
			16.5							SLLY ARG,NVP
			16.5							
2750			21.6							SH: AA
			15.5							LMST: AA
			18.0					P		***high nozzle velocities are
			16.5							pulverizing the carbonate samples**
			18.0							***severe simpson sloughing***
2755			18.0							SH: DK GRY,BLK,F to MED TEX,BLKY,SLLY
			20.5							CALRUS
			20.5							LMST: WH,CRM,BRN,MXLN to CRYPTO,I/III,
			19.0							SLLY ARG,NVP W SL VNG CALC
			21.5							
2760			18.0							SH: AA
			19.0							LMST: AA
			21.5							
			21.5							
			21.5							
2765			21.5							SH: AA
			21.5							LMST: AA
			21.5							
2770										SH: AA
										LMST: AA
								P		

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.M.O. 6: JAKE

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2775		-NB#13,M84F	21.5							SH: DK GRY,BLK a W hint GRN,F TEX,
		76 M 19.25HRS	14.5							SFT to firm,BLKY to PLTY,SLLY CALRUS
			14.5							LMST: LT to DK BRN,MXLN tO CRYPTO,
			13.0							I/III,SL to MOD ARG,NVP,VNG CALC
			13.0							TR: PYR,MIC
2780			13.0							SH: AA
		WOB = 15-17000	21.5							LMST: AA
		RPM = 60	16.5							TR: PYR
		SPM = 60/60	14.5							
		P.P = 14300	14.5							
2785			14.5							SH: AA
			13.0							LMST: AA
			13.0							TR: MIC,PYR
			13.0							
			12.0							
2790			14.5							SH: AA
			14.5							LMST: AA
			14.5							TR: MIC
			15.5							
			15.5							
2795			15.5							SH: AA
			14.5							LMST: AA
			13.0							TR: PYR,MIC
			13.0							
			14.5							
2800			14.5							SH: DK GRY,BLK SL BRN W a hint GRN,SFT
			14.5							to firm,BLKY to PLTY,SL to MOD CALCUS
			14.5							LMST: LT to DK BRN SL WH to DK GRY,I,
			14.5							I/III,MXLN to CRYPTO,SL to MOD W VNG
			14.5							CALC TR: MIC,FOSS (crinoid)
2805			13.0							SH: AA
			13.0							LMST: AA
			15.5							TR: MIC,PYR,FOSS(crinoid)
			14.5							
			14.5							
2810			14.5							SH: AA
			12.0							LMST: AA
			12.0							
			14.5							
			13.0							
2815			12.0							SH: AA W TR of FOSS(crinoid) and PYR
			12.0							LMST: AA W TR QTZ
			12.0							
			12.0							
			12.0							
2820			14.5							SH: AA
			13.0							LMST: AA
			12.0							TR: DOL W PYBIT,LT GRY,III,NVP,CRYPTO,
			12.0							TR: PYR
			13.0							
2825			12.0							SH: DK GRY,BLK SL BRN W a hint GRN,SFT
			12.0							to firm,BLKY to PLTY,SL to MOD CALRUS
			10.5							LMST: LT to DK BRN SL WH to DK GRY,I
			12.0							I/III,MXLN to CRYPTO,SL to MOD ARG W
			10.5							VNG CALC TR: DOL AA,PYR,QTZ
2830			10.5							SH: AA
			10.5							LMST: AA
			12.0							Lk: DOL,WH to LT GRY,CRYPTO,II,V CL,
			13.0							NVP, W PYBIT between its XL STR
			13.0							TR: PYR,QTZ

Wellname: SHELL KY AL ARKWRIGHT B-41 Location: C.M.O. #: 24282

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2835			13.0							SH: AA
			13.0							LMST: AA
			13.0							TR: DOL AA
			13.0							TR: PYR.
			13.0							
2840		-DS 1.8,N44W	13.0							SH: AA
			13.0							LMST: AA
			13.0							TR: DOL AA
			13.0							TR: PYR
			14.0							
2845			14.0							SH: AA
			14.0							LMST:AA
			14.0							TR: DOL AA,PYR,QTZ within some of the
			14.0							LMST AA
			14.0							
2850			14.0							SH: AA
		WOB = 15-17000	14.0							LMST: AA
		RPM = 60	14.0							TR DOL decresses TYP AA
		SPM = 60/60	14.0							
		P.P = 13000	14.0							
2855		DEN =1115								refer to core report
		VIS =62								
		WL =7.6								
		pH =10								
2860	-Dh									refer to core report
		Core #3								
		Bit=ECCL,SCP778								
		WOB= 5000								
		P.P= 6200								
2865		REC:14.470f14.8								refer to core report
		DEN =1120								
		VIS =71								
		WL =8.6								
		pH =10.5								
2870		Core #4								refer to core report
		Bit=ECCL,SCP778								
		WOB=5000								
		P.P=7000								
		REC:18.0f18.0								
2875		DEN =1136								refer to core report
		VIS =69								
		WL =8.4								
		pH =10								
2880										refer to core report
2885										refer to core report
		DST#4 2878-2904								
		NO PACKER SEAT								
2890		NO TEST	13.5							SH: DK GRY to LT GRN,SFT to firm,BLKY
			18.0			(4)				to SLLY FIS,SL CALRUS
			12.0							DOL: WH to SLLY GRY,I,I/III,CRYPTO W
			12.0							CRS XL size,TR saddle DOL XL W TR QTZ,
			9.5							CALC and PYR,POSS FRACD and VUGY POR

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.H.G. #: 3855

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	PORO	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2895			9.5							SH: AA
			12.0							DOL: AA
			16.5							TR: AA W PYBIT Mineral content SLLY
			16.5							DECRG W possible FRACD and VUGY POR
			13.0							W PYBIT
2900			13.0							SH: AA
			15.5							DOL: AA
			16.5							TR: QTZ CALC,PYR SL indication of
			13.0							saddle DOL,FRACD evidence only SL
			15.5							indication of VUGY POR W PYBIT
2905	-Darc		16.5							SH: AA
			16.5							DOL: WH to CRM BUFTAN,I-I/III,CRYPTO
			16.5							W CRS XL size,V CLN,evidence Of VUGY
			16.5							POR W TR PYBIT (saddle DOL XL)
			16.0							TR: QTZ,PYR,CALC
2910			15.0							SH: AA
			15.0							DOL: CRM BUFTAN W DECRG WH COL,I-I/III
			15.0							MXLN to CRYPTO W DECRG DOL saddle XL,
			17.0							NVP TR: PYBIT,CALC,PYR,QTZ
			16.0							
2915			14.0							SH: AA
			17.0							DOL: CRM BUFTAN W WH (saddle XL),I,
			18.0							MXLN,NVP,evidence of healed fractures
			18.0							some III W PYBIT may be cave-ins ??
			18.0							TR: CALC,PYR,
2920			20.0							SH: AA
			18.0							DOL: AA no evidence of healed fracture
			16.0							but TR PYBIT within III INTXLN STR
			13.0							TR: PYR,CALC
			12.0							
2925			13.0							SH: AA
			13.0							DOL: CRM BUFTAN W SL WH COL,I,MXLN,NVP
			13.0							evidence of healed fractures W SL TR
			13.0							PYBIT,NVP
			12.0							TR: CALC,PYR
2930			14.0							SH: AA
			9.0							DOL: AA evidence of healed fractures,
			10.0							NVP
			12.0							
		WOB = 15-18000	9.0							TR: CALC,PYR,QTZ
2935		RPM = 55/60	8.0							SH: AA
		SPM = 60/60	7.0							DOL: AA
		P.P.= 8000	9.0							
		DEN = 1120	14.0							
		VIS = 61	13.0							TR: CALC PYR,QTZ
2940		WL = 8.8	10.0							SH: AA
		pH = 10	5.0							DOL: AA W BTR POR lined W PYBIT and
			8.0							CALC healed fracture sample is GEN TI,
			9.0							I,SL I/III
			13.0							TR: PYR,QTZ
2950		DST#3 2925-2994	15.5							DOL,BUFF-BRN-WH,F-MXLN,I-I/III,A,SL-
		NO PRESSURES	15.5							MOD,
		REC.= 786m H2O	13.0							TR SH,MED GRY,SLTY,BLKY,SLI.CALC
		114m MUD	12.0							TR CALC
			16.5							
2955			14.5							DOL,BUFF-BRN-WH,F-MXLN,I-I/III,A,SL-
			10.5							MOD,
			9.5							TR SH,MED GRY,SLTY,BLKY,SLI.CALC
			13.0							TR CALC
			9.5							TR PYR * TR MINOR FRACS

Wellname: SHELL ET AL ARKONOMAD E-01 Location: C.M.S. 01 JAKES

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
2960			10.5							DOL,GRY-BRN,I,TR I/III,A,MXLN,SL-MOD
			14.5							TR SH,MED GRY,SLTY,BLKY,SLLY.CALC
		-DS 5.5,N 51 W	12.0							TR CALC
			12.0							TR PYR * TR MINOR FRACS
			18.0							
2965			16.5							DOL,GRY-BRN,I,TR I/III,A,MXLN,SL-MOD
			19.0							TR SH,MED GRY,SLTY,BLKY,SLLY.CALC
			13.0							TR CALC
			16.5							TR PYR
			9.0							
2970			13.0							DOL,GRY-BRN,I,TR I/III,A,MXLN,SL-MOD
			15.5							SOME PYBIT STAINING IN DOLOMITE
			12.0							TR SH,MED GRY,SLTY,BLKY,SLLY.CALC
			12.0							TR CALC,LOOSE AND VEINING
			12.0							TR PYR
2975			9.5							TR SH: AA
			8.0							DOL: GRY to LT BRN,I,TR I/III,MXLN,SL-
			12.0							MOD ARG,evidence of HOR and VERT frac-
			9.5							tures W CALC and TR PYBIT infillings
			13.0							TR: PYR
2980			16.5							TR SH: AA
			14.5							DOL: AA evidence of VERT fractures W
			10.5							CALC, AND TR PYBIT,PYR,infillings
			14.5							SLLY DKR BRN COL TR: PYR
			13.0							
2985			10.5							TR SH: AA
			8.0							DOL: LT GRY-LT DKR BRN,I,TR I/III,MXLN
			14.5							,SL-MOD ARG,evidence of VERT fractures
			13.0							W CALC,PYBIT and QTZ infillings
			18.0							TR: CALC,PYR,QTZ
2990			18.0							TR SH: AA
			15.5							DOL: AA,except MOD-V ARG,evidence of
			28.0							VERT fractures W CALC and DOL infill-
			28.0							ings W TR PYR NODS on DOL surface
			13.0							TR: CALC,PYR
2995			27.5							SL TR SH AA
			26.5							DOL: LT GRY -DRK BRN some WH,I,SL TR
										I/III,MXLN,SL-MOD ARG,evicdence of
										VERT fractures W CALC and DOL infill-
										ings SL TR PYBIT present
3000		WOB = 15-18000								SL TR SH AA
		RPM = 50/60								DOL: discription AA
		SPM = 60/60								
		P.P = 5500								
3005		M HRS	26.0							DOL,BUFF-WH-GRY,I,MXLN,A,SLI-MOD
			26.0							TR SH,GRY,SLTY,MED,BLKY
		DEN = 1110	14.0							TR CALC
		VIS = 69	25.0							TR PYBIT
		WL = 9.6	16.5							
3010		pH = 10	14.0							TR SH GRY SMWT BLK,F TEX,SFT-MED HD,
			20.0							BLKY,SL FIS,SL-MOD CALRUS
			21.5							DOL: LT GRY BUFTAN DK BRN,I,TR I/III,
			22.5							MXLN,SL-MOD ARG,W TR intergrown QTZ
			19.0							NODS and PYR XL TR CALC
3015			15.0							TR SH AA
			20.0							DOL: AA
			13.0							
			22.5							
			14.5							

Wellname: SHELL ET AL ALEXANDRIA B-41 Location: C.M.S. #1 JAZZ

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
3020			16.5							TR SH AA
			12.0							DOL: AA but W INCR INTGRAN QTZ NODS,
			12.0							DOL COL BCM LT GRY SL BUFTAN
			24.0							TR: PYR,CALC
			19.0							
3025			12.5							SH: AA
			16.5							DOL: AA INTGRAN QTZ NOD are MED to
			19.0							CRS (QTZ NODS are CLR in COL)
			18.0							TR: PYR,CALC
			18.0							
3030			19.0							SH:AA
										DOL: AA
3035										TR SH AA
										DOL: LT GRY BUFTAN,I,MXLN,SL ARG,NVP,
										INTGRAN MED to CRS QTZ CLR NODS within
										TR PYR
3040										TR SH AA
										DOL: AA
										TR SS?: CLR,MED-CRS, ANG,P SRT,SILOUS
										CMT,CONS,NVP,WL compacted
		MOB = 15-18000								
3045		RPM = 50/60	12.0							DOL: LT GRY BUFTAN,I,MXLN,SL ARG,NVP,
		SPM = 60/60	12.0							INTGRAN MED to CRS QTZ CLR NODS within
		P.P = 10000	12.0							TR SH AA
		DEN = 1140	10.5							TR SS,aa
		VIS = 63	15.5							
3050		WL = 7.6	10.5							DOL: LT GRY BUFTAN,I,MXLN,SL ARG,NVP,
		pH = 10	27.5							INTGRAN MED to CRS QTZ CLR NODS within
			26.5							TR SH AA
			25.0							TR SS,aa
			12.0							
3055			12.0							DOL: LT GRY BUFTAN,I,MXLN,SL ARG,NVP,
			12.0							INTGRAN MED to CRS QTZ CLR NODS within
			15.5							TR SH AA
			14.0							TR SS,aa
			12.0							
3060	-Cu		19.0							DOL,GRY-TAN,I,MXLN,A,CLN-MOD
			20.5							SH,DK.GRY,SLTY-SUB LITHGR,MED,BLKY
			22.5							SILTST,BRICK RED-ORANGE,V SLTY,BLKY
			19.0							TR PYR
			24.0							
3065			21.5							DOL,GRY-TAN,I,MXLN,A,CLN-MOD
			22.5							SILTST,BRICK RED-ORANGE,V SLTY,BLKY
			21.5							SH,DK.GRY,SLTY-SUB LITHGR,MED,BLKY
			24.0							TR PYR
			21.5							
3070			24.0							DOL: AA
			27.5							SLTST: AA
			22.5							SH: AA
		Last Sample May	20.5							TR: IG RK,GLAUC
		Not Be Repre-	16.5							
3075		sentative Since	19.0							SH: DK GRY,SLTY SUB LITHGR,MED BLKY
		The Drill Pipe	19.0							SLTST: BRICK RED-ORANGE,SLTY,BLKY
		Was Being Work-	19.0							DOL: LT GRY,WH W a GRN hint POSS V
		ed During Final	19.0							GLAUCC content
	-TD	Circulation	18.0							TR: IG RK,QTZ,GLAUC,CHT

Wellname: SHELL ET AL ARBUCKLE B-41 Location: C.N.O. of JAMES

DEPTH	TOPS	BIT/TECH DATA	ROP	1-------50	CORE	DST	POR	LITHOLOGY	SHOW	GEOLOGICAL DESCRIPTION
3080										

Wellname: SHELL ET AL ARROWHEAD B-41 Location: C.N.G. de [illegible]

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: SHELL ET AL ARROWHEAD B-41 **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
500		70% Shale 30% Sand/Sandstone	Shale, light.-medium grey, medium-FRM, silty, blocky sandstone, tan, very fine, subrounded, MWS, Calcite, consolidated, no visible porosity
505		80% Shale 20% Sand/Sandstone	Shale, light.-medium grey, medium-FRM, silty, blocky sandstone, tan, very fine, subrounded, MWS, Calcite, consolidated, no visible porosity
510		100% Shale	Shale, light.-medium grey, medium-FRM, silty, blocky trace sandstone, tan, very fine, subrounded, MWS, Calcite, consolidated, no visible porosity
515		100% Shale	Shale, light.-medium grey, medium-FRM, silty, blocky trace sandstone, tan, very fine, subrounded, MWS, Calcite, consolidated, no visible porosity
520		100% Shale	Shale, light.-medium grey, medium-FRM, silty, blocky trace sandstone, tan, very fine, subrounded, MWS, Calcite, consolidated, no visible porosity
525		100% Shale	Shale, medium grey, medium-FRM, silty, blocky
530		100% Shale	Shale, medium grey, medium-FRM, silty, blocky
535		100% Shale	Shale, medium grey, medium-FRM, silty, blocky
540		100% Shale	Shale, medium grey, medium-FRM, silty, blocky
545		100% Shale	Shale, medium grey, medium-FRM, silty, blocky
550		100% Shale	Shale, medium grey, medium-FRM, silty, blocky
555			
560		95% Shale 5% Sand/Sandstone	Shale, medium grey, SOFT-medium, silty, platy-blocky sandstone, tan, very fine, subrounded, MWS, Calcite-silica, consolidated, no visible porosity trace glauconite IN sandstone
565		100% Shale	Shale, medium grey, medium, sub lithographic, platy-blocky
570		100% Shale	Shale, medium grey, medium, sub lithographic, platy-blocky
575		100% Shale	Shale, medium grey, medium, sub lithographic, platy-blocky
580		100% Shale	Shale, medium grey, medium, sub lithographic, platy-blocky
585		100% Shale	Shale, medium grey, medium, sub lithographic, platy-blocky
590		100% Shale	Shale, medium grey, medium, sub lithographic, platy-blocky
595			SEE CORE DESCRIPTION

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
600			
			SEE CORE DESCRIPTION
605			
			SEE CORE DESCRIPTION
610			
	Kbq		SEE CORE DESCRIPTION
615			
			SEE CORE DESCRIPTION
620			
			SEE CORE DESCRIPTION
625			
			SEE CORE DESCRIPTION
630			
			SEE CORE DESCRIPTION
635		90% Sand/Sandstone 10% Shale	sandstone,clear-white,fine-Coal,pseudo-,silica,unconsolidated-LOOSE,no visible porosity Shale,medium.grey,silty,blocky trace COAL
640		85% Sand/Sandstone 15% Shale	sandstone,clear-white,fine-Coal,pseudo-,silica,unconsolidated-LOOSE,no visible porosity Shale,medium.grey,silty,blocky trace COAL ** EXTENSIVE YELLOW fluorescence no CUT
645		80% Limestone 20% Shale	limestone,grey-buff,crystalline,very fine,SLI-moderate.argillaceous Shale,medium.grey,silty,blocky
650	Md @652m	90% Limestone 10% Shale	limestone,grey-tan-buff,crystalline,very fine,SLI-moderate.argillaceous Shale,medium.grey,silty,blocky
655		95% Limestone 5% Shale	limestone,cream-grey-brown,crystalline,very fine,SLI-moderate.argillaceous Shale,medium.grey,silty,blocky

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
660		100% Limestone	limestone,cream-grey-brown,crystalline,very fine,SLI-moderate.argillaceous
665		85% Limestone 15% Shale	limestone,cream-grey-brown,crystalline,very fine,SLI-moderate.argillaceous Shale,dark.grey,silty,blocky limestone fossiferous IN PART
670		95% Limestone 5% Shale	limestone,cream-grey-brown,crystalline,very fine,SLI-moderate.argillaceous trace Shale,dark.grey,silty,blocky limestone fossiferous IN PART
675		95% Limestone 5% Shale	limestone,cream-grey-brown,crystalline,very fine,SLI-moderate.argillaceous Shale,dark.grey,silty,blocky limestone fossiferous IN PART
680		85% Limestone 15% Shale	limestone,cream-grey-brown,crystalline,very fine,SLI-moderate.argillaceous Shale,dark.grey,silty,blocky limestone fossiferous IN PART trace pyrite trace chert
685		40% Limestone 60% Shale	Shale,dark.grey,silty,blocky limestone,cream-buff,crystalline,very fine-microcrystalline,A,SLI limestone fossiferous IN PART trace pyrite trace chert
690		70% Limestone 30% Shale	limestone,grey-cream,crystalline,microcrystalline,A,SLI Shale,dark.grey,silty,blocky trace pyrite limestone fossiferous IN PART PYRITE DISSEMINATED IN limestone
695		65% Limestone 35% Shale	limestone,cream-grey,crystalline,tr crystalline/sucrosic,very fine-microcrystalline,A,SLI Shale,dark.grey,silty,blocky trace COAL trace pyrite trace chert
700		80% Limestone 20% Shale	limestone,cream-brown,very fine-microcrystalline,A,crystalline,SLI-moderate Shale,grey-BLUE,silty,medium,blocky-flaky trace chert
705		10% Limestone 90% Shale	Shale,grey-BLUE,silty,medium,blocky-flaky limestone,cream-brown,very fine-microcrystalline,A,crystalline,SLI-moderate trace chert

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
710		35% Limestone 65% Shale	Shale,grey-BLUE,silty,medium,blocky-flaky limestone,cream-brown,very fine-microcrystalline,A,crystalline,SLI-moderate trace chert trace pyrite
715		25% Limestone 75% Shale	Shale,light.grey,silty,medium,platy limestone,cream-buff,crystalline,microcrystalline,A,SLI trace chert
720		20% Limestone 80% Shale	Shale,light.grey,silty,medium,platy limestone,cream-buff,crystalline,microcrystalline,A,SLI trace chert
725		100% Shale	Shale,light.grey,silty,medium,platy
730		100% Shale	Shale,light.grey,silty,medium,platy,Calcite
735		100% Shale	Shale,light.grey,silty,medium,platy,Calcite
740		100% Shale	Shale,light.grey,silty,medium,platy,Calcite
745		100% Shale	Shale,light.grey,silty,medium,platy,Calcite
750		100% Shale	Shale,light.grey,silty,medium,platy,Calcite
755		100% Shale	Shale,light.grey,silty,medium,platy,Calcite
760		100% Shale	Shale,light.grey,silty,medium platy,Calcite
765		100% Shale	Shale,light.grey,silty,medium,platy,Calcite
770		100% Shale	Shale,light.grey,silty,HARD,platy-blocky,Calcite
775		100% Shale	Shale,light.grey,silty,HARD,platy-blocky,Calcite
780		30% Limestone 70% Shale	limestone,cream-brown,crystalline,microcrystalline,A,SLI.-moderate Shale,medium.-dark.grey,silty,HRD,blocky,Calcite
785		100% Shale	Shale,medium.grey,silty,HRD,blocky,Calcite
790	Mp	100% Shale	Shale,medium.grey,silty,medium,blocky,Calcite trace limestone,aa
795		100% Shale	Shale,medium.grey,silty,medium,blocky,Calcite trace limestone,aa

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
800		10% Limestone 90% Shale	Shale,medium.grey,silty,medium,blocky,Calcite limestone,as
805		80% Limestone 20% Shale	limestone,buff-tan,crystalline-crystalline/sucrosic,fine-microcrystalline,Btr,SLI. Shale,medium.-dark.grey,SILTY,SOFT-medium,blocky,CAL STRONG YELLOW fluorescence.,no CUT
810		100% Limestone	limestone,buff-tan,crystalline-crystalline/sucrosic,fine-microcrystalline,Btr,SLI. trace Shale,medium.-dark.grey,SILTY,SOFT-medium,blocky, Calcite STRONG YELLOW fluorescence.,no CUT
815	Mb	10% Limestone 90% Shale	Shale,medium.-dark.grey,SILTY,SOFT-medium,blocky, Calcite limestone,buff-tan,crystalline-crystalline/sucrosic,fine-microcrystalline,Btr,SLI. STRONG YELLOW fluorescence.,no CUT
820		100% Shale	Shale,grey-blue,silty,blocky,medium,Calcite Shale IS FISSILE ALL THROUGH THIS SECTION
825		15% Limestone 85% Shale	Shale,grey-blue,silty,blocky,medium,Calcite limestone,cream,crystalline-crystalline/sucrosic,very fine-microcrystalline,A,clean-SLI
830		100% Shale	Shale,grey-blue,silty,blocky,medium,Calcite
835		30% Limestone 70% Shale	Shale,grey-blue,silty,splintery,medium,Calcite limestone,white-cream,crystalline,fine-microcrystalline,A,clean-SLI.
840		95% Shale 5% Dolomite	Shale,grey-blue,silty,splintery,medium,Calcite dolomite,tan-brown,crystalline-chalky,SILTY,A,clean-SLI. trace limestone,white-cream,crystalline,fine-microcrystalline,A,clean-SLI. trace pyrite
845		100% Shale	Shale,grey-blue,silty,splintery,medium,Calcite trace dolomite,tan-brown,crystalline-chalky,SILTY,A,clean-SLI. trace limestone,white-cream,crystalline,fine-microcrystalline,A,clean-SLI.
850		100% Shale	Shale,grey-blue,silty,splintery,medium,Calcite Shale CONTINUES TO BE SPLINTERY AND FISS.
855		5% Limestone 95% Shale	Shale,grey-blue,silty,splintery,medium,Calcite limestone,cream-white,crystalline,microcrystalline,A,clean-SLI fossiferous
860		10% Limestone 45% Dolomite 45% Shale	dolomite,tan-brown,crystalline-chalky,SILTY,A,clean-[illegible]. Shale,grey-blue,silty,splintery,medium,Calcite limestone,cream-white,crystalline,microcrystalline,A,clean-SLI

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
860		10% Limestone 45% Dolomite 45% Shale	dolomite,tan-brown,crystalline-chalky,SILTY,A,clean-SLI. Shale,grey-blue,silty,splintery,medium,Calcite limestone,cream-white,crystalline,microcrystalline,A,clean-SLI
865		10% Limestone 55% Dolomite 35% Shale	dolomite,tan-brown,crystalline-chalky,SILTY,A,clean-SLI. Shale,grey-blue,silty,splintery,medium,Calcite limestone,cream-white,crystalline,microcrystalline,A,clean-SLI
870		60% Limestone 10% Dolomite 30% Shale	limestone,cream-white,crystalline,microcrystalline,A,clean-SLI Shale,grey-blue,silty,splintery,medium,Calcite dolomite,tan-brown,crystalline-chalky,SILTY,A,clean-SLI. fossiferous
875		40% Limestone 10% Dolomite 50% Shale	limestone,white-cream,crystalline-crystalline/sucrosic,fine-microcrystalline,A,clean-SLI. Shale,light.grey,silty,SOFT-medium,flaky-blocky dolomite,tan-brown,crystalline-chalky,SILTY,A,clean-SLI. trace pyrite
880		35% Limestone 5% Dolomite 60% Shale	Shale,light.grey,silty,SOFT-medium,flaky-blocky limestone,white-cream,crystalline-crystalline/sucrosic,fine-microcrystalline,A,clean-SLI. dolomite,tan-brown,crystalline-chalky,SILTY,A,clean-SLI. trace pyrite
885		35% Limestone 65% Shale	Shale,light.grey-Green,silty,SOFT-medium,flaky-blocky limestone,white-cream,crystalline-crystalline/sucrosic,fine-microcrystalline,A,clean-SLI. trace dolomite,tan-brown,crystalline-chalky,SILTY,A,clean-SLI. trace pyrite
890		30% Limestone 70% Shale	Shale,light.grey-Green,silty,SOFT-medium,flaky-blocky limestone,white-cream,crystalline-crystalline/sucrosic,fine-microcrystalline,Btr,clean-SLI trace dolomite,tan-brown,crystalline-chalky,SILTY,A,clean-SLI. trace pyrite
895		100% Shale	Shale,grey-blue,FRM,silty,SPLINT trace limestone,white-cream,crystalline-crystalline/sucrosic,fine-microcrystalline,Btr,clean- trace pyrite
900		100% Shale	Shale,grey-blue,FRM,silty,SPLINT trace limestone,white-cream,crystalline-crystalline/sucrosic,fine-microcrystalline,Btr,clean- trace pyrite
905		100% Shale	Shale,grey-blue,FRM,silty,SPLINT trace limestone,white-cream,crystalline-crystalline/sucrosic,fine-microcrystalline,Btr,clean- trace pyrite
910		100% Shale	Shale,grey-brown,fissile-blocky,HRD,sub lithographic

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
915		100% Shale	Shale,grey-brown,fissile-blocky,HRD,sub lithographic -silty
920		100% Shale	Shale,grey-brown,fissile-blocky,HRD,sub lithographic -silty
925		100% Shale	Shale,grey-brown,fissile-blocky,HRD,sub lithographic -silty
930		100% Shale	Shale,grey-brown,fissile-blocky,HRD,sub lithographic -silty
935		100% Shale	Shale,grey-brown,fissile-blocky,HRD,sub lithographic -silty
940		100% Shale	Shale,grey-brown,fissile-blocky,HRD,sub lithographic -silty
945		100% Shale	Shale,grey-brown,fissile-blocky,HRD,sub lithographic -silty
950		100% Shale	Shale,grey-brown,fissile-blocky,HRD,sub lithographic -silty
955		15% Limestone 85% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
960		100% Shale	Shale,grey-brown,fissile-blocky,HRD,sub lithographic -silty
965		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
970		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
975		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
980		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty dolomite,brown-tan,crystalline,SILTY,very fine-fine,A,SLI-moderate
985		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
990		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
995		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
1000		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
1005		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
1010		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
1015		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
1020		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
1025		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
1030		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
1035		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
1040		100% Shale	Shale,light.grey-brown ,edium,fissile-blocky,sub lithographic-silty
1045		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
1050		100% Shale	Shale,light.grey-brown,medium,fissile-blocky,sub lithographic-silty
1055			** see mud log for further sample discription
1060			
1065			

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: DATE:

LOCATION: C.W.O. #:

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
1070			
1075			
1080			
1085			
1090			
1095			
1100			
1105			
1110			
1115			
1120			
1125			
1130			
1135			
1140			
1145			
1150			
1155			
1160			
1165			
1170			
1175			
1180			

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
1185			
1190			
1195			
1200			
1205			
1210			
1215			
1220			
1225			
1230			
1235			
1240			
1245			
1250			
1255			
1260			
1265			
1270			
1275			
1280			
1285			
1290			
1295			

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
1300			
1305			
1310			
1315			
1320			
1325			
1330			
1335			
1340			
1345			
1350	-Me	100% Shale	Shale; blackish-brown,some grey,fine-texture,hard,slight FISS,trace chert,trace pyrite * for further detail refer to the mud-logging strip chart
1355			
1360			
1365			
1370	-Dkc	100% Dolomite	dolomite; slight limy,Cryptocrystalline,cream to slight grey,crystalline,no visible porosity ,slight-moderate argillaceous,with intervals of dolomite/limestone and shaley dolomite * for further detail refer to the mud-logging strip chart
1375			
1380			
1385			
1390			

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
1395			
1400			
1405			
1410			
1415			
1420			
1425			
1430			
1435			
1440			
1445			
1450			
1455			
1460			
1465			
1470			
1475			
1480			
1485			
1490			
1495			
1500			
1505			

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
1510			
1515			
1520			
1525			
1530			
1535			
1540			
1545			
1550			
1555			
1560			
1565			
1570			
1575			
1580			
1585			
1590			
1595			
1600			
1605			
1610			
1615			
1620			

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATTION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
1625			
1630			
1635			
1640			
1645			
1650			
1655			
1660			
1665			
1670			
1675			
1680			
1685			
1690			
1695			
1700			
1705			
1710			
1715			
1720			
1725			
1730			
1735			

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
1740			
1745	-Dte	100% Shale	Shale; dark black with some slight grey, fine/waxy texture, calcareous, hard, blocky bedding * for further detail refer to the mud-logging strip chart
1750			
1755			
1760	-Dtr	100% Limestone	limestone; light-medium brown, crystalline, Cryptocrystalline, moderate argillaceous, with trace pyrite, no visible porosity, sequences of dolomite/limestone and Shale/dolomite * for further detail refer to the mud-logging strip chart
1765			
1770			
1775			
1780			
1785			
1790			
1795			
1800			
1805			
1810			
1815			
1820			
1825			
1830			

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
1835			
1840			
1845			
1850	-Dks	100% Silt/Siltstone	siltstone; grey-grey/Green,slight limy,generally rough texture,blocky type bedding * for further detail refer to the mud-logging strip chart
1855			
1860			
1865			
1870			
1875			
1880	-Dfs	100% Limestone	limestone; Buf-Tan,Cryptocrystalline,crystalline,slight-moderate argillaceous with Shale/siltstone/medium grey-grey brown,crystalline,Cryptocrystalline,dolomite stringers * for further detail refer to the mud-logging strip chart
1885			
1890			
1895			
1900			
1905			
1910			
1915			
1920			
1925			

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
1930			
1935			
1940			
1945			
1950			
1955			
1960			
1965			
1970			
1975			
1980			
1985			
1990			
1995			
2000			
2005			
2010			
2015			
2020			
2025			
2030			
2035			
2040			

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2045			
2050			
2055			
2060			
2065			
2070			
2075			
2080			
2085			
2090			
2095			
2100			
2105			
2110			
2115			
2120			
2125			
2130			
2135			
2140			
2145			
2150			
2155			

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2160			
2165			
2170			
2175			
2180			
2185			
2190			
2195			
2200			
2205			
2210			
2215			
2220			
2225			
2230			
2235			
2240			
2245			
2250			
2255			
2260			
2265			
2270			

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2275			
2280			
2285			
2290			
2295			
2300			
2305			
2310			
2315			
2320			
2325			
2330			
2335			
2340			
2345			
2350			
2355			
2360			
2365			
2370			
2375			
2380			
2385			

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2390			
2395			
2400			
2405			
2410			
2415			
2420			
2425			
2430			
2435			
2440			
2445			
2450			
2455			
2460			
2465			
2470			
2475			
2480			
2485			
2490			
2495			
2500		100% Shale	Shale: light to medium grey, with ahint of Green and brown, fine texture, soft to slightly firm, blocky but slightly fissile, slightly calcareous

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2505		100% Shale	Shale: as above
2510		100% Shale	Shale: as above
2515		100% Shale	Shale: as above
2520		100% Shale	Shale: as above
2525		100% Shale	Shale: medium to dark grey with slight color of Green increasing black,fine texture,soft,blocky but slightly fissile,slightly calcareous
2530		100% Shale	Shale: as above,but 50/50 dark grey and black with trace of Green color trace: pyrite
	-Dmsk		
2535		100% Shale	Shale: as above
2540		100% Shale	Shale: as above
2545		100% Shale	Shale: as above trace: pyrite
2550		95% Shale 5% Limestone	Shale: medium to dark grey,black,with slight brown and Green color,fine texture,soft to firm,blocky but slightly fissile,very calcareous with trace of pyrite limestone: black,dark brown,dense type crystalline,no visible porosity,slightly argillaceous,Cryptocrystalline
	-Dsp		
2555		90% Shale 10% Limestone	Shale: as above limestone: as above
2560		90% Shale 10% Limestone	Shale: as above limestone: as above trace: pyrite
2565		85% Shale 15% Limestone	Shale: medium to dark grey,black,with slight brown and Green color,fine texture,soft to firm,blocky but slightly fissile,very Calcite,trace veining Calcite,5% Calcite nodules limestone: black,dark brown,dense type crystalline,no visible porosity,slightly to moderate argillaceous,Cryptocrystalline
2570		90% Shale 10% Limestone	Shale: as above,but 2% Calcite nodules limestone: as above

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2575		95% Shale 5% Limestone	Shale: as above,but trace Calcite nodules,more veining Calcite limestone: as above
2580		90% Shale 10% Limestone	Shale: as above limestone: as above
2585		95% Shale 5% Limestone	Shale: as above limestone: as above trace: pyrite
2590		85% Shale 15% Limestone	Shale: as above limestone: as above trace: pyrite
2595		75% Shale 25% Limestone	Shale: medium to dark grey,black,with slight brown and Green color,fine texture,soft to firm,blocky but slightly fissile,very Calcite,trace veining Calcite and pyrite limestone: black,dark brown,dense type crystalline,no visible porosity,slightly argillaceous,Cryptocrystalline
2600		70% Shale 30% Limestone	Shale: medium to dark grey,black,with slight Green hint soft to firm,blocky but slightly fissile,slightly calcareous limestone: black,dark brown,crystalline,no visible porosity,slightly argillaceous,Cryptocryst ,with veining Calcite
2605		70% Shale 30% Limestone	Shale: as above limestone: as above trace: pyrite
2610		70% Shale 30% Limestone	Shale: as above limestone: as above
2615		70% Shale 30% Limestone	Shale: as above limestone: as above
2620		70% Shale 30% Limestone	Shale: as above limestone: as above
2625		65% Shale 35% Limestone	Shale: as above limestone: as above
2630		60% Shale 40% Limestone	Shale: as above limestone: as above trace: pyrite

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2635		55% Shale 45% Limestone	Shale: as above limestone: as above trace: pybrobitumen
2640		45% Shale 55% Limestone	Shale: medium to dark grey,black,with slight brown and Green color,fine texture,soft to firm,blocky but slightly fissile,slightly calcareous limestone: black,dark brown,crystalline,microcrystalline to Cryptocrystalline,no visible poro slightly argillaceous with veining Calcite and trace pybrobitumen
2645		45% Shale 55% Limestone	Shale: as above limestone: as above trace: pybrobitumen
2650		40% Shale 60% Limestone	Shale: as above limestone: as above trace: pybrobitumen
2655		40% Shale 60% Limestone	Shale: as above limestone: as above trace: pybrobitumen
2660	-Dwt	20% Shale 80% Limestone	Shale: as above, but trace pieces with a bluish Green color and trace of pyrite limestone: as above
2665		60% Shale 40% Limestone	Shale: medium grey,black,brown,trace bluish Green,fine texture blocky,slightly,fissile or platy,slight to moderate calcareous limestone: white to light tan,dense chalky-chalky/sucrosic,dark brown,(crystalline) with veining Calcite,clean to slightly Calcite, microcrystalline to Cryptocrystalline,no visible porosity,with trace pybrobitumen
2670		30% Shale 70% Limestone	Shale: like as above the bluish Green has ingrowth pyrite limestone: as above,increasing in white color
2675		30% Shale 70% Limestone	Shale: medium to dark grey,black,fine texture,blocky,slightly fissile or platy limestone: white to light tan,dense chalky-chalky/sucrosic,very clean microcrystaliine to Cryptocrystalline,no visible porosity
2680		25% Shale 75% Limestone	Shale: as above limestone: as above with trace pybrobitumen

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2685		20% Shale 80% Limestone	Shale: as above limestone: as above with trace pybrobitumen
2690		15% Shale 85% Limestone	Shale: as above limestone: as above with trace pybrobitumen
2695		10% Shale 90% Limestone	Shale: as above limestone: as above with trace pybrobitumen trace: pyrite
2700		70% Shale 30% Limestone	Shale: dark grey to black,fine texture,soft to firm, blocky slightly platy limestone: as above,slightly argillaceous trace: siltstone,
2705		50% Shale 50% Limestone	Shale: as above limestone: as above
2710		20% Shale 80% Limestone	Shale: black,dark grey,fine texture,soft to hard,blocky, slightly fissile,slightly calcareous,trace fossil(crinoid) limestone: white,light to dark grey,trace brown,microcrystalline to Cryptocrystalline,white to black chalky,chalky/sucrosic,very clean to moderate argillaceous,with trace veining Calcite,no visible porosity
2715		20% Shale 80% Limestone	Shale: as above limestone: as above
2720		20% Shale 80% Limestone	Shale: as above limestone: as above
2725		40% Shale 60% Limestone	Shale: as above limestone:as above ***high nozzle velocities are pulverizing the carbonate samples** ***severe simpson soughing***
2730	-Dh	55% Shale 45% Limestone	Shale: as above limestone: as above trace: pyrite
2735		55% Shale 45% Limestone	Shale: as above limestone: as above
2740		55% Shale 45% Limestone	Shale: as above limestone: as above

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2745		55% Shale 45% Limestone	Shale: dark grey,black,fine-medium texture,blocky,slightly calcareous limestone: white,cream,brown,microcrystalline to Cryptocrystalline,crystalline/sucrosic slightly argillaceous,no visible porosity
2750		55% Shale 45% Limestone	Shale: as above limestone: as above ***high nozzle velocities are pulverizing the carbonate samples** ***severe simpson sloughing***
2755		55% Shale 45% Limestone	Shale: dark grey,black,fine to medium texture,blocky,slightly calcareous limestone: white,cream,brown,microcrystalline to Cryptocrystalline,crystalline/sucrosic, slightly argillaceous,no visible porosity with slight veining Calcite
2760		50% Shale 50% Limestone	Shale: as above limestone: as above
2765		35% Shale 65% Limestone	Shale: as above limestone: as above
2770		45% Shale 55% Limestone	Shale: as above limestone: as above
2775		100% Shale 60% Shale 40% Limestone	Shale: dark grey,black a with hint Green,fine texture, soft to firm,blocky to platy,slightly calcareous limestone: light to dark brown,microcrystalline tO Cryptocrystalline, crystalline/sucrosic,slight to moderate argillaceous,no visible porosity,veining Calcite trace: pyrite,mica
2780		60% Shale 40% Limestone	Shale: as above limestone: as above trace: pyrite
2785		60% Shale 40% Limestone	Shale: as above limestone: as above trace: mica,pyrite
2790		45% Shale 55% Limestone	Shale: as above limestone: as above trace: mica
2795		35% Shale 65% Limestone	Shale: as above limestone: as above trace: pyrite,mica

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2800		25% Shale 75% Limestone	Shale: dark grey,black slight brown with a hint Green,soft to firm,blocky to platy,slight to moderate CALCUS limestone: light to dark brown slight white to dark grey,crystalline, crystalline/sucrosic,microcrystalline to Cryptocrystalline,slight to moderate with veining Calcite trace: mica,fossil (crinoid)
2805		25% Shale 75% Limestone	Shale: as above limestone: as above trace: mica,pyrite,fossil(crinoid)
2810		25% Shale 75% Limestone	Shale: as above limestone: as above
2815		30% Shale 70% Limestone	Shale: as above with trace of fossil(crinoid) and pyrite limestone: as above with trace quartz
2820		30% Shale 70% Limestone	Shale: as above limestone: as above trace: dolomite with pybrobitumen,light grey,sucrosic,no visible porosity,Cryptocrystalline, trace: pyrite
2825		25% Shale 75% Limestone	Shale: dark grey,black slight brown with a hint Green,soft to firm,blocky to platy,slight to moderate calcareous limestone: light to dark brown slight white to dark grey,crystalline crystalline/sucrosic,microcrystalline to Cryptocrystalline,slight to moderate argillaceous wi veining Calcite trace: dolomite as above,pyrite,quartz
2830		25% Shale 75% Limestone	Shale: as above limestone: as above trace: dolomite,white to light grey,Cryptocrystalline,chalky,very clay, no visible porosity, with pybrobitumen between its crystal structure trace: pyrite,quartz
2835		25% Shale 75% Limestone	Shale: as above limestone: as above trace: dolomite as above trace: pyrite
2840		20% Shale 80% Limestone	Shale: as above limestone: as above trace: dolomite as above trace: pyrite
2845		25% Shale 75% Limestone	Shale: as above limestone:as above trace: dolomite as above,pyrite,quartz within some of the limestone as above

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2850		30% Shale 70% Limestone	Shale: as above limestone: as above trace dolomite decreases type as above
2855		10% Dolomite 90% Dolomite	refer to core report
2860	-Dh	100% Dolomite	refer to core report
2865		100% Dolomite	refer to core report
2870		100% Dolomite	refer to core report
2875		100% Dolomite	refer to core report
2880		100% Dolomite	refer to core report
2885		100% Dolomite	refer to core report
2890		10% Shale 90% Dolomite	Shale: dark grey to light Green,soft to firm,blocky to slightly fissile,slight calcareous dolomite: white to slightly grey,crystalline,crystalline/sucrosic,Cryptocrystalline with coarse crystal size,trace saddle dolomite crystal with trace quartz, Calcite and pyrite,possibly fractured and vuggy porosity
2895		5% Shale 95% Dolomite	Shale: as above dolomite: as above trace: as above with pybrobitumen Mineral content slightly decreasing with possible fractured and vuggy porosity with pybrobitumen
2900		5% Shale 95% Dolomite	Shale: as above dolomite: as above trace: quartz Calcite,pyrite slight indication of saddle dolomite,fractured evidence only slight indication of vuggy porosity with pybrobitumen
2905	-Darc	5% Shale 95% Dolomite	Shale: as above dolomite: white to cream Buf-Tan,crystalline-crystalline/sucrosic,Cryptocrystalline with coarse crystal size,very clean,evidence Of vuggy porosity with trace pybrobitumen (saddle dolomite crystal) trace: quartz,pyrite,Calcite
2910		5% Shale 95% Dolomite	Shale: as above dolomite: cream Buf-Tan with decreasing white color,crystalline-crystalline/sucrosic microcrystalline to Cryptocrystalline with decreasing dolomite saddle crystal, no visible porosity trace: pybrobitumen,Calcite,pyrite,quartz

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2915		5% Shale 95% Dolomite	Shale: as above dolomite: cream Buf-Tan with white (saddle crystal),crystalline, microcrystalline,no visible porosity,evidence of healed fractures some sucrosic with pybrobitumen may be cave-ins ?? trace: Calcite,pyrite,
2920		5% Shale 95% Dolomite	Shale: as above dolomite: as above no evidence of healed fracture but trace pybrobitumen within sucrosic INTXLN structure trace: pyrite,Calcite
2925		5% Shale 95% Dolomite	Shale: as above dolomite: cream Buf-Tan with slight white color,crystalline,microcrystalline,no visible poros evidence of healed fractures with slight trace pybrobitumen,no visible porosity trace: Calcite,pyrite
2930		5% Shale 95% Dolomite	Shale: as above dolomite: as above evidence of healed fractures, no visible porosity trace: Calcite,pyrite,quartz
2935		5% Shale 95% Dolomite	Shale: as above dolomite: as above trace: Calcite pyrite,quartz
2940		5% Shale 95% Dolomite	Shale: as above dolomite: as above with BTR porosity lined with pybrobitumen and Calcite healed fracture sample is generally tight, crystalline,slight crystalline/sucrosic trace: pyrite,quartz
2950		100% Dolomite	dolomite,buff-brown-white,fine-microcrystalline,crystalline-crystalline/sucrosic,A,slight-moderate, trace Shale,medium grey,silty,blocky,SLI.Calcite trace Calcite
2955		100% Dolomite	dolomite,buff-brown-white,fine-microcrystalline,crystalline-crystalline/sucrosic,A,slight-moderate, trace Shale,medium grey,silty,blocky,SLI.Calcite trace Calcite trace pyrite * trace MINOR FRACS

SHELL CANADA LIMITED

WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME: **DATE:**

LOCATION: **C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
2960		100% Dolomite	dolomite,grey-brown,crystalline,trace crystalline/sucrosic,A,microcrystalline,slight-moderate trace Shale,medium grey,silty,blocky,slightly.Calcite trace Calcite trace pyrite * trace MINOR FRACS
2965		100% Dolomite	dolomite,grey-brown,crystalline,trace crystalline/sucrosic,A,microcrystalline,slight-moderate trace Shale,medium grey,silty,blocky,slightly.Calcite trace Calcite trace pyrite
2970		100% Dolomite	dolomite,grey-brown,crystalline,trace crystalline/sucrosic,A,microcrystalline,slight-moderate SOME pybrobitumen STAINING IN DOLOMITE trace Shale,medium grey,silty,blocky,slightly.Calcite trace Calcite,LOOSE AND VEINING trace pyrite
2975		100% Dolomite	trace Shale: as above dolomite: grey to light brown,crystalline,trace crystalline/sucrosic,microcrystalline,slight- moderate argillaceous,evidence of horizontal and vertical frac- tures with Calcite and trace pybrobitumen infillings trace: pyrite
2980		100% Dolomite	trace Shale: as above dolomite: as above evidence of vertical fractures with Calcite, AND trace pybrobitumen,pyrite,infillings slightly darker brown color trace: pyrite
2985		100% Dolomite	trace Shale: as above dolomite: light grey-light darker brown,crystalline,trace crystalline/sucrosic,microcrystalli ,slight-moderate argillaceous,evidence of vertical fractures with Calcite,pybrobitumen and quartz infillings trace: Calcite,pyrite,quartz
2990		100% Dolomite	trace Shale: as above dolomite: as above,except moderate-very argillaceous,evidence of vertical fractures with Calcite and dolomite infill- ings with trace pyrite nodules on dolomite surface trace: Calcite,pyrite
2995		100% Dolomite	slight trace Shale as above dolomite: light grey -DRK brown some white,crystalline,slight trace crystalline/sucrosic,microcrystalline,slight-moderate argillaceous,evicdence of vertical fractures with Calcite and dolomite infill- ings slight trace pybrobitumen present
3000		100% Dolomite	slight trace Shale as above dolomite: discription as above

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
3005		100% Dolomite	dolomite,buff-white-grey,crystalline,microcrystalline,A,SLI-moderate trace Shale,grey,silty,medium,blocky trace Calcite trace pybrobitumen
3010		100% Dolomite	trace Shale grey somewhat black,fine texture,soft-medium hard, blocky,slight fissile,slight-moderate calcareous dolomite: light grey Buf-Tan dark brown,crystalline,trace crystalline/sucrosic, microcrystalline,slight-moderate argillaceous,with trace intergrown quartz nodules and pyrite crystal trace Calcite
3015		100% Dolomite	trace Shale as above dolomite: as above
3020		100% Dolomite	trace Shale as above dolomite: as above but with increasing intergranular quartz nodules, dolomite color becoming light grey slight Buf-Tan trace: pyrite,Calcite
3025		5% Shale 95% Dolomite	Shale: as above dolomite: as above intergranular quartz nodular are medium to coarse (quartz nodules are clear in color) trace: pyrite,Calcite
3030		5% Shale 95% Dolomite	Shale:as above dolomite: as above
3035		100% Dolomite	trace Shale as above dolomite: light grey Buf-Tan,crystalline,microcrystalline,slight argillaceous,no visible poro intergranular medium to coarse quartz clear nodules within trace pyrite
3040		100% Dolomite	trace Shale as above dolomite: as above trace sandstone?: clear,medium-coarse, angular,pepper sorted,siliciceous cement,consolidated,no visible porosity,well compacted
3045		100% Dolomite	dolomite: light grey Buf-Tan,crystalline,microcrystalline,slight argillaceous,no visible poro intergranular medium to coarse quartz clear nodules within trace Shale as above trace sandstone,aa
3050		100% Dolomite	dolomite: light grey Buf-Tan,crystalline,microcrystalline,slight argillaceous,no visible poro intergranular medium to coarse quartz clear nodules within trace Shale as above trace sandstone,aa

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WELLSITE TECHNICAL LOG
Petrophysical Engineering

WELLNAME:	**DATE:**
LOCATION:	**C.W.O. #:**

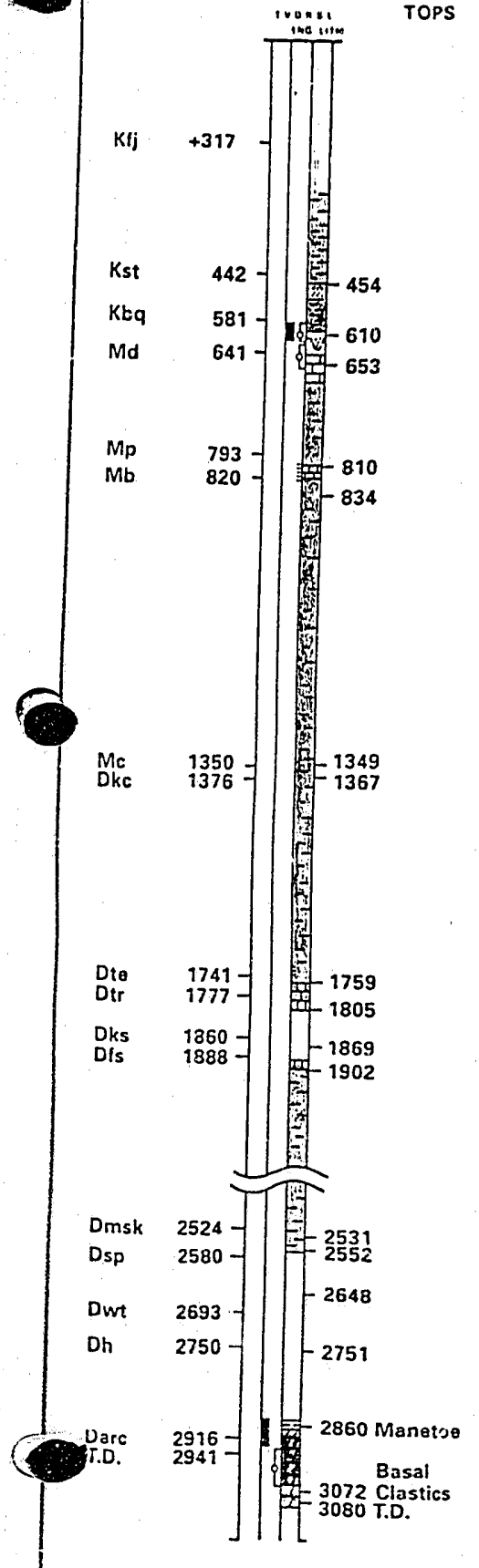
DEPTH	FORMATION TOPS	LITHOLOGY	GEOLOGICAL SAMPLE DESCRIPTION
3055		100% Dolomite	dolomite: light grey Buf-Tan,crystalline,microcrystalline,slight argillaceous,no visible poro
			intergranular medium to coarse quartz clear nodules within
			trace Shale as above
			trace sandstone,aa
3060	-Cu	85% Dolomite	dolomite,grey-tan,crystalline,microcrystalline,A,clean-moderate
		10% Shale	Shale,dark.grey,silty-sub lithographic,medium,blocky
		5% Silt/Siltstone	SILTST,BRICK red-ORANGE,very silty,blocky
			trace pyrite
3065		70% Dolomite	dolomite,grey-tan,crystalline,microcrystalline,A,clean-moderate
		20% Silt/Siltstone	SILTST,BRICK red-ORANGE,very silty,blocky
		10% Shale	Shale,dark.grey,silty-sub lithographic,medium,blocky
			trace pyrite
3070		70% Dolomite	dolomite: as above
		20% Silt/Siltstone	siltstone: as above
		10% Shale	Shale: as above
			trace: igneous rock,glauconite
3075		90% Dolomite	Shale: dark grey,silty sub lithographic,medium blocky
		5% Silt/Siltstone	siltstone: BRICK red-ORANGE,silty,blocky
		5% Shale	dolomite: light grey,white with a Green hint possibly very
			glauconitic content
	-TD		trace: igneous rock,quartz,glauconite,chert
3080			

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Ground Elevation: 512.4 m K.B.: 520 m
Total Depth: 3080 m
Class: NFW Status: SUSPENDED BASAL QUARTZ GAS WELL
Spud Date: JAN. 22, 1989
Rig Release: MAR. 17, 1989

FRONTIER DIVISION WELL SUMMARY

SHELL et al, Arrowhead B-41



Location: Latitude 60°30.142' Longitude 122°53.2855'

Seismic Control: Line A006500052 S.P. 858

Hydrocarbon Bearing Zones: 6 m of gas pay in Basal Quartz sandstone

LOCATION: Approximately 43 km northeast of Ft. Liard, N.W.T.
Coordinates 60° 30 142' Lat.; 122° 53.2855' Long.

WELL COST: ($k)

	AFE		Actual Costs	After Tax Costs
Shell Share (100%)	2500	D&A	2600	1378
incremental cost-prod. test	400		310	164
	2900		2910	1542

LAND SITUATION: This well earned 30% bringing Shell's net interest to 80% in 19,082 gross hectares on EL 311. EL 311 will expire on October 5, 1989 unless an SDA is declared on the lands. An SDA application will be filed this summer based on the Basal Quartz suspended gas zone.

PROSPECT: The purpose of the well was to test two primary targets. The shallow target is the basal Cretaceous sandstone which occurs in paleo lows incised into Mississippian carbonates. The B-41 location was intended to test anticlinal closure of the valley mapped seismically. Presence of oil staining in the 'Basal Quartz' in offset wells was interpreted to mean this was likely an oil accumulation. Based on all available data the prospect was estimated to contain 2.3 to 4.6 E6M3 recoverable oil. The deep target is potentially gas bearing Manetoe facies dolomite in the mid-Devonian Presquile and Hume carbonates. A seismic amplitude change at the well location was interpreted as porous Manetoe dolomite overlying tight Arnica dolomites. The amplitude feature was mapped over an area on several seismic lines with potential success volumes calculated at approximately 15 BCM sales gas.

RESULTS:

Reservoir Fm.	Depths	Net Reservoir	Porosity	SW
Cretaceous;Basal Quartz	622-653 m	6 m (gas)	19%	0.24
Mississippian; Pekisko	810-817 m	4.8 m(?)	11%	0.27
Devonian; Manetoe	2855-3050 m	0		

A suite of logs and two open hole DSTs were run on the Basal Quartz immediately upon penetrating Mississippian carbonates at 654 m. Gross reservoir quality sandstone encountered was 19.8 m averaging 18% porosity. the basal 8.5 m and the middle 5 m of sandstone calculated water bearing and the upper 6.3 m calculated gas bearing. The middle zone was drillstem tested and recovered 353 m of 4950 ppm water and drilling mud with a trace of gas. The upper zone was drillstem tested and recovered gas to surface immediately at an estimated rate of 113,000 m^3/d (2000 kPa, 3/4" choke) with no water. The Pekisko was production tested through casing as is normal practice for this zone, but was found to have very low permeability (traces of gas and condensate were produced) and was abandoned. Rock properties of the Manetoe dolomites are not clearly understood petrophysically, however based on the core recovered, an extensive suite of logs (including a mud log) it was felt that any reservoir development was very poor quality and water bearing. To confirm this, two DSTs were planned. DST #1 was run over the deeper zone 2925-2994 m, however there was no influx of fluid or gas into the tool. DST #2 was attempted over 2872 m to 2904 m but misran due to the upper packer failing to seat. Hole problems prevented any further open hole testing and the decision was made to abandon the deep zone.

SUMMARY: Geologically, the Basal Quartz zone came in as prognosed, however it was gas bearing instead of oil bearing. Extensive light oil stain and the presence of an asphaltene-like material in the matrix of the quartz grains is strong evidence that a continuous oil phase was present but had been displaced by a younger gas phase. Reservoir quality is very good despite the solid hydrocarbon present. In western Canada, the Pekisko historically is a marginal quality producer with a few exceptions. Permeability is often problematic and although the petrophysical evaluation was good enough to merit a production test, permeability was considered to be the key risk. Cuttings indicated the presence of microporosity and the lack of significant flow from the zone upon production testing is consistent with poor permeability. At the Manetoe level, the amplitude response in the seismic appears to have been caused in part by soft shale present in the Alpha Marker zone overlying the Manetoe.

FUTURE ACTIVITY: **Medium term** (2-3 years); very few opportunities exist operationally (land, seismic or drilling) in the southern Mackenzie Corridor due to suspension of Crown land sales (land claims negotiations) and imminent expiry of remaining Shell (and other) lands in the area. Evaluation of competitor held SDL's for potential purchase of known Devonian gas reserves is recommended (buyer's market). **Short term**; archiving the "state of the art" in current geophysical and geological understanding of the area is underway in preparation for termination of the active "Corridor" Team in the spring of 1989. Remaining Middle Devonian gas opportunities in the southern Corridor will be handled by the Northern Plains Stratigraphic Team i.e. Bovie Lake D_S Prospect. All other opportunities and new play concepts will be compiled in 1989 Mackenzie Corridor Exploration Time Capsule to be kept on file in Frontier District.

Prepared by: MacKenzie Corridor Team Date: April 26, 1989

Concur Date:

FM AGE	FM NAME	DEPTH (SAMPLE)	DEPTH (LOGS)
Cretaceous	Basal Quartz (Kbq)	611	610
Mississippian	Debolt (Md)	652	653
	Peskisko	790	810
	Banff (Mb)	816	834
	Exshaw (Me)	1350	1349
Devonian	Kotcho (Dke)	1370	1367
	Tetcho (Dte)	1745	1759
	Trout River (Dtr)	1760	1805
	Kakisa (Dks)	1850	1869
	Ft. Simpson (Dfs)	1880	1902
	Muskwa (Dmsk)	2534	2531
	Slave Point (Dsp)	2554	2552
	Watt Mountain (Dwt)	2663	2648
	Hume/Presquile (Dh)	2733	2751
	Arnica (Darc)	2906	2860
	Cambrain	3061	3072
	T.D.	3080	3080

WELL EVALUATION

A. *DOWN HOLE LOGS*

DITE-PHASOR INDUCTION LOG

Run #1:	Feb 5, 1989	667.0 - 311.0m
#2:	Feb 12, 1989	1056.0 - 311.0m
#3:	Mar 16, 1989	2883.0 - 1056.0m

CNL-LDT-GR

Run #1:	Feb 5, 1989	667.0 - 311.0m
#2:	Feb 12, 1989	1056.0 - 311.0m
#3:	Mar 7, 1989	3080.0 - 1056.0m

BOREHOLE COMPENSATED SONIC - GR (BHCS)

Run #1:	Feb 5, 1989	667.0 - 311.0m
#2:	Feb 12, 1989	1056.0 - 311.0m
#3:	Mar 7, 1989	3080.0 - 1056.0m

DUAL LATEROLOG (DLL)

Run #1:	Mar 7, 1989	3080.0 - 2840.0m
		1900.0 - 1340.0m

MICRO SPHERICALLY FOCUSED LOG (MSFL)

Run #1:	Feb 5, 1989	667.0 - 311.0m
	Mar 7, 1989	1900.0 - 2840.0m

SPECTRAL GAMMA RAY (NGT)

Run #1: Mar 7, 1989 3080.0 - 1056.0m

FORMATION MICRO SCANNER (FMS)

Run #1: Mar 7, 1989 3080.0 - 2840.0m

MICROLOG - (ML)

Run #1: Mar 7, 1989 3080.0 - 2840.0m

CEMENT VOLUME LOG (CVL)

Run #1: Feb 12, 1989 1056.0 - 311.0m

#2: Mar 7, 1989 3080.0 - 1056.0m

VERTICAL SEISMIC PROFILE (VSP)

Run #1: Mar 8, 1989 16 shot points

B. SYNTHETIC SEISMOGRAMS, VELOCITY SURVEYS, VSP'S

* Synthetic seismograms
* Velocity surveys
* Vertical seismic profile

C. FORMATION STIMULATION - PRODUCTION TESTING

(89-03-21)

* rig up Dowell for acid frac. (810 - 816m).

* pumped $10m^3$ 15% HCL, nitrified to 80 SCM/M^3 acid, 110 ball sealers. max. press.= 24mPa @ $2.0m^3$/min, displaced with N_2 at 200 SCM/min.

* rigged out Dowell and started flowing well to separator.

TIME	PRESSURE (kPa)	WATER RATE
1600	720	0.35
1630	80	0.14
1700	70	0.09
1730	70	0.19
1800	70	0.15
1900	60	0.28
2000	60	0.04
2100	55	0.04
2200	55	No Flow
2300	55	No Flow
2400	55	No Flow

(89-03-22)

0100	50	No Flow
0200	50	No Flow
0300	45	No Flow
0400	45	No Flow
0500	45	No Flow
0600	45	No Flow

0700 Shut in and rig up endless tubing unit (ETU)
0745 Run in and unload well with N_2 at 820m. Recovered $2.02m^3$ of spent acid.
1200 Rig out ETU, well open testers. Too small to measure at < 10 PSI.

(89-03-23)

0700 Reverse circulate well inhibited water.

(89-03-24)

0500 Run baker N-1 packer and set at 785m K.B.
0700 Pump bail 30 linear meters of cement on bridge plug.
1530 Install wellhead, bull plug. Displace top 3m to diesel, chain and lock wellhead.
2300 Rig release.

D. DRILL STEM TESTING

SHELL ET AL ARROWHEAD B-41

Test No.	1	2	3
Formation:	Basal Quartz	Basal Quartz	Arnica
Interval:	633 - 641	621 - 632	2925 - 2994
Flow Rates			
Gas (M^3/D)	T.S.T.M.	113, 269	Nil
Condensate(bbl/D)	Nil	Nil	Nil
Water (bbl/D)	Nil	Nil	Nil
Pressures (kPa)			
Initial Hydro.	6541.0	6597.0	33 340
Start P.F.	2691.4	1847.5	9 376
Start S.I.	2894.4	2745.9	11 733
End S.I.	4950.5	5029.2	24 305
Start F.F.	3176.2	2336.6	10 162
Start F.S.I.	4754.8	3536.5	
End F.S.I.	4952.8	5018.5	
Final Hydro.	6553.9	6624.9	
Misc.			
Choke Size	19.05mm	19.05mm	
Temp(°C)	33.0	33.2	240°F approx.
Flow Time	3.5 - 59.0	5 - 60	63 - 78
S.I. Time	63 - 152	70 - 120	* - 62
Test Date	89-02-06	89-02-07	89-03-13
Comments			
	Recovered approx. 353m of salt water & mud. Cl^-= 8000ppm	Reversed out muddy, brackish salt water. Cl^-= 2000ppm	Closed chamber. because of high temp. We could not tell if the tool was opened or closed. We cycled the tool hourly for three hours.

APPENDICES

APPENDIX i

OIL, GAS, H2O ANALYSIS

CRC-42E(Rev.85 04)

SHELL CANADA LIMITED

REQUEST NO. 28198

CONTAINER IDENTITY

LICENCE NUMBER

CALGARY RESEARCH CENTRE
WATER ANALYSIS

LABORATORY NUMBER
9011301 01 100
9010501 02 100

OPERATOR NAME AND ADDRESS
SHELL CANADA RESOURCES LIMITED, P.O. BOX 100, CALGARY, ALBERTA T2P 2H5

U.W.I.	WELL OR SAMPLE NAME	KB ELEVATION/m	GL
300/B41 60-40 122-45/ 0	ARROWHEAD B-41	520.00	512.40

FIELD OR AREA	POOL OR ZONE	NAME OF SAMPLER	COMPANY
	BASAL QUARTZ	J. DICKIE	

TEST TYPE	NO	RECOVERY
DST	002	FILTRATE 18M

MULTIPLE RECOVERY	YES	NO	POINT OF SAMPLE	AMT&TYPE OF CUSHION	MUD RESISTIVITY/Ω•m @ °C
		X	TOP OF TEST TOOL		

TEST INTERVAL/m	TYPE OF PRODUCTION			
00621.00-00632.00	PUMPING	FLOWING	GAS LIFT	SWAB

WATER m^3/d	OIL m^3/d	GAS $10^3m^3/d$

PERFORATIONS/m	GAUGE PRESSURE/kPa			TEMPERATURE/°C			REMARKS
	Separator	Treater	Reservoir	Separator	Treater	Reservoir	FILTRATE -- SLIGHTLY CLOUDY GREY

DATE SAMPLED	RECEIVED	REPORTED	ANALYST
89-02-08	89-02-09	89-02-17	LB/WT/MLT

ION [B]	$\rho_B/g.m^{-3}$	ω_B	$c/mol.m^{-3}$
Na +k	991	0.2912	43.10
K			
Ca	11	0.0032	0.28
Mg	5	0.0015	0.21
Ba			
Sr			
Fe	MUCH		

ION [B]	$\rho_B/g.m^{-3}$	ω_B	$c/mol.m^{-3}$
Cl	178	0.0523	5.03
Br			
I			
HCO_3	1620	0.4761	26.60
SO_4	598	0.1757	6.23
CO_3	0	0.0000	0.00
OH	0	0.0000	0.00
H_2S	NONE		

TOTAL DISSOLVED SOLIDS/$g.m^{-3}$

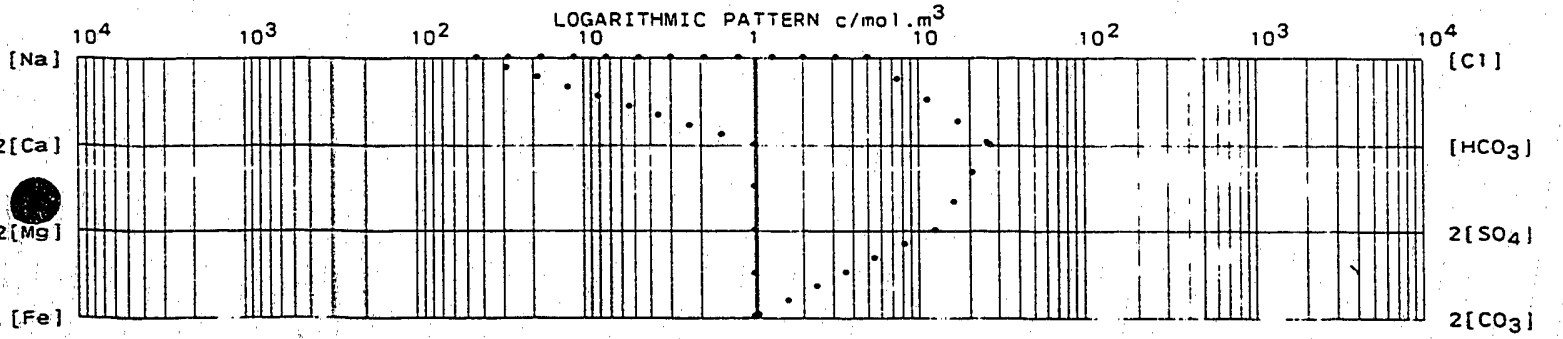
BY EVAPORATION @ 110°C	BY EVAPORATION @ 180°C
AT IGNITION	CALCULATED 3403

RELATIVE DENSITY	REFRACTIVE INDEX
1.003 @ 15.0°C	1.332 @ 25°C

OBSERVED pH	RESISTIVITY/Ω•m
8.1 @ 22.3°C	2.412 @ 25°C

POTASSIUM = 13.6 g/m3
CALCIUM = 11.2 g/m3
MAGNESIUM = 4.66 g/m3

LOGARITHMIC PATTERN $c/mol.m^3$



CRC-42E(Rev.85 04)

SHELL CANADA LIMITED

REQUEST NO. 28198

CONTAINER IDENTITY

LICENCE NUMBER

CALGARY RESEARCH CENTRE
WATER ANALYSIS

LABORATORY NUMBER
9011302 01 100
9010502 02 100

OPERATOR NAME AND ADDRESS
SHELL CANADA RESOURCES LIMITED, P.O. BOX 100, CALGARY, ALBERTA T2P 2H5

U.W.I.	WELL OR SAMPLE NAME	ELEVATION/m KB	GL
300/B41 60-40 122-45/ 0	ARROWHEAD B-41	520.00	512.40

FIELD OR AREA	POOL OR ZONE	NAME OF SAMPLER	COMPANY
	BASAL QUARTZ	J. DICKIE	

TEST TYPE	NO	RECOVERY
DST	001	FILTRATE & FORMATION WATER 653M

MULTIPLE RECOVERY	YES	NO	POINT OF SAMPLE	AMT&TYPE OF CUSHION	MUD RESISTIVITY/Ω•m @ °C
		X	350M ABOVE TOOL (TOP OF FLUID)		

TEST INTERVAL/m	TYPE OF PRODUCTION			
	PUMPING	FLOWING	GAS LIFT	SWAB
00633.00-00641.00				

WATER m^3/d	OIL m^3/d	GAS $10^3m^3/d$

PERFORATIONS/m	GAUGE PRESSURE/kPa			TEMPERATURE/°C			REMARKS
	Separator	Treater	Reservoir	Separator	Treater	Reservoir	FILTRATE -- CLEAR

DATE SAMPLED	RECEIVED	REPORTED	ANALYST
89-02-07	89-02-09	89-02-17	LB/WT/MLT

ION [B]	$\rho_B/g.m^{-3}$	ω_B	$c/mol.m^{-3}$
Na +k	3830	0.3064	167.00
K			
Ca	65	0.0052	1.63
Mg	32	0.0026	1.32
Ba			
Sr			
Fe	NONE		

ION [B]	$\rho_B/g.m^{-3}$	ω_B	$c/mol.m^{-3}$
Cl	2700	0.2160	76.20
Br			
I			
HCO_3	5840	0.4673	95.70
SO_4	31	0.0025	0.33
CO_3	0	0.0000	0.00
OH	0	0.0000	0.00
H2S	NONE		

TOTAL DISSOLVED SOLIDS/$g.m^{-3}$

BY EVAPORATION @ 110°C	BY EVAPORATION @ 180°C

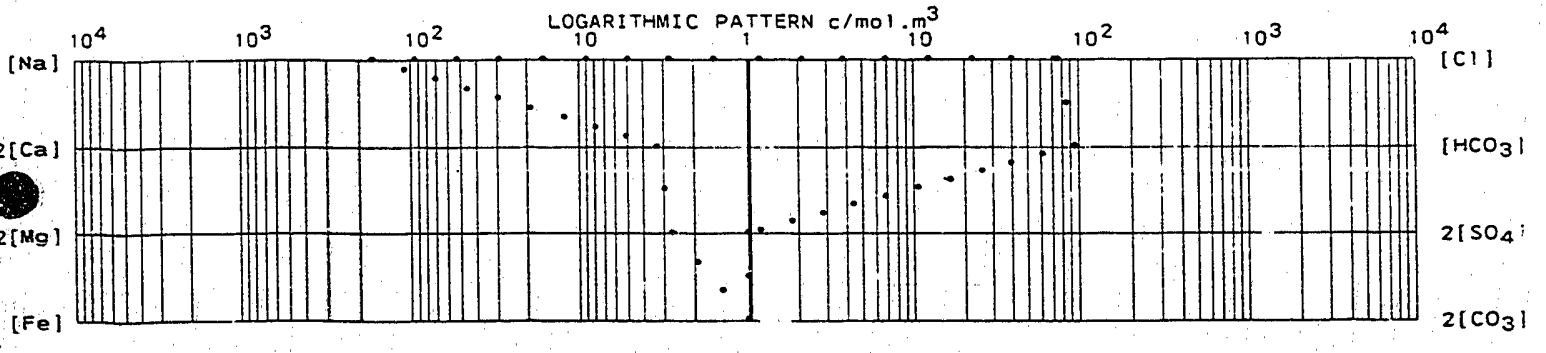
AT IGNITION	CALCULATED
	12498

RELATIVE DENSITY	REFRACTIVE INDEX
1.008 @ 15.0°C	1.334 @ 25°C

OBSERVED pH	RESISTIVITY/Ω•m
7.9 @ 22.6°C	0.655 @ 25°C

POTASSIUM = 37.2 g/m3
CALCIUM = 65.0 g/m3
MAGNESIUM = 31.6 g/m3

LOGARITHMIC PATTERN $c/mol.m^3$



CRC-42E(Rev. 85 04)

SHELL CANADA LIMITED

REQUEST NO. 28198

CONTAINER IDENTITY

LICENCE NUMBER

CALGARY RESEARCH CENTRE
WATER ANALYSIS

LABORATORY NUMBER
9011303 01 100
9010503 02 100

OPERATOR NAME AND ADDRESS
SHELL CANADA RESOURCES LIMITED, P.O. BOX 100, CALGARY, ALBERTA T2P 2H5

U.W.I.	WELL OR SAMPLE NAME	ELEVATION/m KB	GL
300/B41 60-40 122-45/ 0	ARROWHEAD B-41	520.00	512.40

FIELD OR AREA	POOL OR ZONE	NAME OF SAMPLER	COMPANY
	BASAL QUARTZ	J. DICKIE	

TEST TYPE	NO	RECOVERY
DST	001	FILTRATE & FORMATION WATER 653M

MULTIPLE RECOVERY	YES	NO	POINT OF SAMPLE	AMT&TYPE OF CUSHION	MUD RESISTIVITY/Ω•m @ °C
		X	150M ABOVE TOOL		

TEST INTERVAL/m: 00633.00-00641.00

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

WATER m^3/d | OIL m^3/d | GAS $10^3m^3/d$

PERFORATIONS/m

GAUGE PRESSURE/kPa			TEMPERATURE/°C		
Separator	Treater	Reservoir	Separator	Treater	Reservoir

REMARKS: FILTRATE -- CLEAR

DATE SAMPLED	RECEIVED	REPORTED	ANALYST
89-02-07	89-02-09	89-02-17	LB/WT/MLT

ION	$\rho_B/g.m^{-3}$	ω_B	$c/mol.m^{-3}$
Na +k	3670	0.3067	160.00
K			
Ca	60	0.0050	1.50
Mg	27	0.0023	1.12
Ba			
Sr			
Fe	NONE		

ION [B]	$\rho_B/g.m^{-3}$	ω_B	$c/mol.m^{-3}$
Cl	2560	0.2140	72.20
Br			
I			
HCO_3	5610	0.4689	92.00
SO_4	38	0.0032	0.40
CO_3	0	0.0000	0.00
OH	0	0.0000	0.00
H_2S	NONE		

TOTAL DISSOLVED SOLIDS/$g.m^{-3}$

BY EVAPORATION @ 110°C	BY EVAPORATION @ 180°C

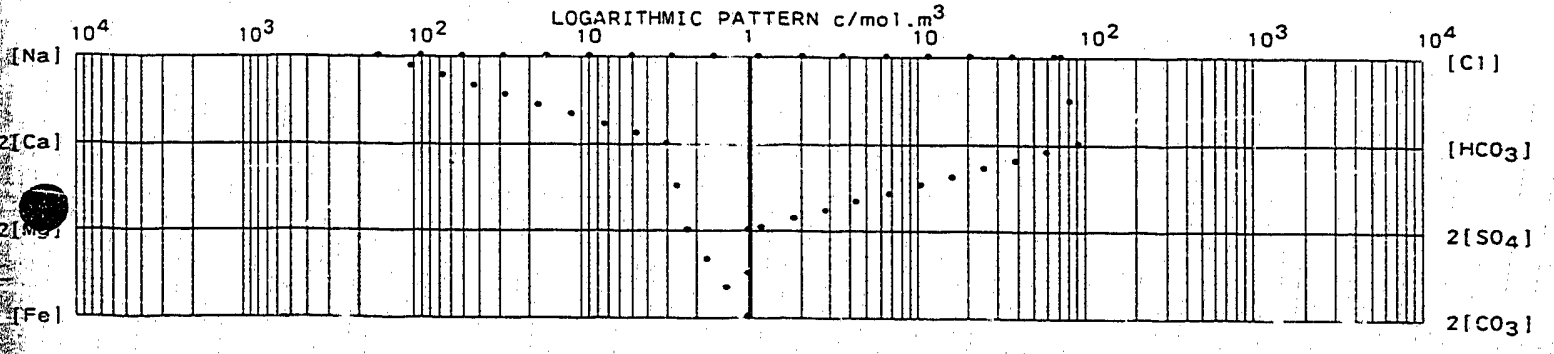
AT IGNITION	CALCULATED
	11965

RELATIVE DENSITY	REFRACTIVE INDEX
1.009 @ 15.0°C	1.334 @ 25°C

OBSERVED pH	RESISTIVITY/Ω•m
8.2 @ 23.6°C	0.675 @ 25°C

POTASSIUM = 38.2 g/m3
CALCIUM = 60.2 g/m3
MAGNESIUM = 27.1 g/m3

LOGARITHMIC PATTERN $c/mol.m^3$



CRC-42E(Rev.85 04)

SHELL CANADA LIMITED

REQUEST NO. 28198

CONTAINER IDENTITY

LICENCE NUMBER

CALGARY RESEARCH CENTRE
WATER ANALYSIS

LABORATORY NUMBER
9011304 01 100
9010504 02 100

OPERATOR NAME AND ADDRESS
SHELL CANADA RESOURCES LIMITED, P.O. BOX 100, CALGARY, ALBERTA T2P 2H5

U.W.I.	WELL OR SAMPLE NAME	ELEVATION/m KB	GL
300/B41 60-40 122-45/ 0	ARROWHEAD B-41	520.00	512.00

FIELD OR AREA	POOL OR ZONE	NAME OF SAMPLER	COMPANY
	BASAL QUARTZ	J. DICKIE	

TEST TYPE	NO	RECOVERY
DST	001	FILTRATE & FORMATION WATER 653M

MULTIPLE RECOVERY	YES	NO	POINT OF SAMPLE	AMT&TYPE OF CUSHION	MUD RESISTIVITY/Ω•m @ °C
		X	TOP OF TEST TOOL (SEE REMARKS)		

TEST INTERVAL/m: 00633.00-00641.00

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

WATER m^3/d | OIL m^3/d | GAS $10^3 m^3/d$

PERFORATIONS/m

GAUGE PRESSURE/kPa			TEMPERATURE/°C		
Separator	Treater	Reservoir	Separator	Treater	Reservoir

REMARKS
FILTRATE -- CLEAR
REVISED REPORT -- 89-03-21
SAMPLE COMMENT: QUESTIONABLE ORIGIN OF SAMPLE RECOVERY (RE: KINGSLEY BLADES)

DATE SAMPLED	RECEIVED	REPORTED	ANALYST
89-02-07	89-02-09	89-02-16	LB/WT/MLT

ION	ρ_B/g.m^{-3}	ω_B	c/mol.m^{-3}
Na +k	2230	0.3017	96.90
K			
Ca	18	0.0024	0.45
Mg	23	0.0031	0.95
Ba			
Sr			
Fe	NONE		

ION	ρ_B/g.m^{-3}	ω_B	c/mol.m^{-3}
Cl	1280	0.1732	36.10
Br			
I			
HCO_3	3680	0.4979	60.30
SO_4	160	0.0216	1.67
CO_3	0	0.0000	0.00
OH	0	0.0000	0.00
H_2S	NONE		

TOTAL DISSOLVED SOLIDS/g.m^{-3}

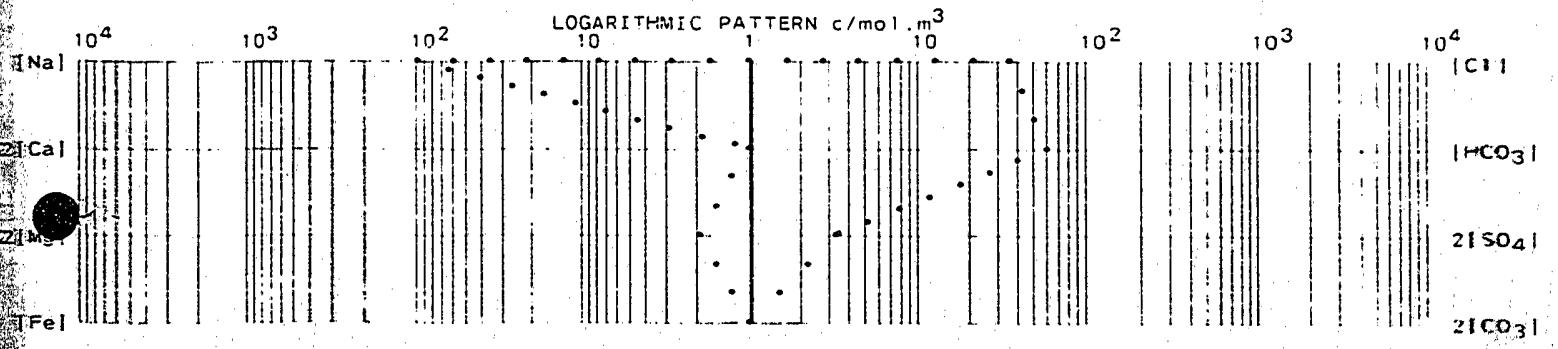
BY EVAPORATION @ 110°C	BY EVAPORATION @ 180°C

AT IGNITION	CALCULATED
	7391

RELATIVE DENSITY	REFRACTIVE INDEX
1.009 @ 15.0°C	1.333 @ 25°C

OBSERVED pH	RESISTIVITY/Ω•m
8.2 @ 22.5°C	0.998 @ 25°C

POTASSIUM = 34.4 g/m3
CALCIUM = 18.1 g/m3
MAGNESIUM = 22.8 g/m3



WATER, GAS

ANALYSES

9211-SG-2-1

CHEMEX Labs Alberta Inc.

GAS ANALYSIS

OTTAWA COPY

CONTAINER IDENTITY: 131870,10561
SAMPLE POINT I.D #:
LABORATORY NUMBER: 88-3457-1
LICENCE NO:
OPERATOR NAME AND ADDRESS: SHELL CANADA LIMITED
CPA NUMBER:
WELL NAME: SHELL ET AL ARROWHEAD B-41 60-30N-122-53W
ELEVATIONS METERS: KB 519.99 GRD 512.38
FIELD OR AREA: ARROWHEAD
POOL OR ZONE: BASAL QUARTZ
NAME OF SAMPLER:
COMPANY: SCHLUMBERGER

TEST TYPE: DST
NO: 01
MULTIPLE RECOVERY:
INITIAL PERFORATIONS
FROM: m
TO: m
FROM: 633 m
TO: 641 m

TEST RECOVERY: 8M
SAMPLING POINT: BOTTOM SAMPLER 105611
AMT & TYPE OF CUSHION:
MUD RESISTIVITY: @25° C
TYPE OF PRODUCTION: PUMPING FLOWING GAS LIFT SWAB
PRODUCTION RATES: WATER m³/d OIL m³/d GAS 10³m³/d
GAUGE PRESSURE - KPa: SEPARATOR 4200 TREATER AS RECEIVED 4200
TEMPERATURES °C: SEPARATOR TREATER AS RECEIVED
DATE SAMPLED Y M D H:M: 89-02-06
DATE RECEIVED Y M D: 89-02-10
DATE REPORTED Y M D: 89-02-13
ANALYST: P.K.

COMP	MOL FRACTION AIR FREE AS REC'D	MOL FRACTION AIR FREE ACID GAS FREE	LIQUID VOLUME ml. m⁻³ AIR FREE AS REC'D
H_2	TRACE	TRACE	
He	TRACE	TRACE	
N_2	0.0022	0.0022	
CO_2	0.0017	0.0000	
H_2S	0.0000	0.0000	
C_1	0.9945	0.9962	
C_2	0.0007	0.0007	
C_3	0.0005	0.0005	1.80
iC_4	0.0002	0.0002	0.86
nC_4	0.0001	0.0001	0.41
iC_5	0.0001	0.0001	0.48
nC_5	TRACE	TRACE	TRACE
C_6	0.0000	0.0000	0.00
C_{7+}	0.0000	0.0000	0.00
C_8			
C_9			
C_{10}			
TOTAL	1.0000	1.0000	3.55

PROPERTIES

RELATIVE DENSITY

MOISTURE FREE AS SAMPLED		MOISTURE AND ACID GAS FREE	
MEASURED	CALCULATED	MEASURED	CALCULATED
	0.558		0.556

CALCULATED PSEUDO CRITICAL PROPERTIES

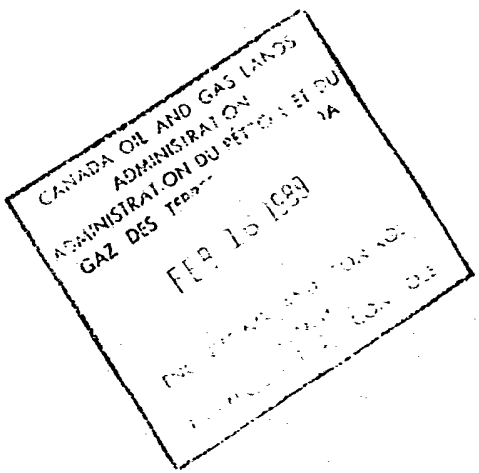
AS SAMPLED		ACID GAS FREE	
PPC	PTC	PPC	PTC
4605.7	190.9	4601.0	190.7

CALCULATED GROSS HEATING VALUE (MJ/m³)

@ 101.35 KPA @ 15 °C		@ 14.65 PSIA @ 60 °F DRY	
A.P.M.C (AGA #5)	MOISTURE AND ACID GAS FREE	ACID GAS FREE	ACID GAS INCL.
37.70	37.70	37.51	37.44

REMARKS

BOTTOM SAMPLERS CONTAINED 3600 mls WATER


CANADA OIL AND GAS LANDS
ADMINISTRATION
GAZ DES
FEB 15 1989

CHEMEX Labs Alberta Inc.

WATER ANALYSIS

72/-36-2-/

OTTAWA COPY

CONTAINER IDENTITY	131870,10561
SAMPLE POINT I.D. #	
LABORATORY NUMBER	88-3457-2
LICENCE NO.	
OPERATOR NAME AND ADDRESS	SHELL CANADA LIMITED
CPA NUMBER	
WELL NAME	SHELL ET AL ARROWHEAD B-41 60-30N-122-53W
ELEVATIONS METERS KB	519.99
ELEVATIONS METERS GRD	512.38
FIELD OR AREA	ARROWHEAD
POOL OR ZONE	BASAL QUARTZ
NAME OF SAMPLER	
COMPANY	SCHLUMBERGER
TEST RECOVERY	8M
TEST TYPE	DST
NO	01
MULTIPLE RECOVERY	
SAMPLING POINT	BOTTOM SAMPLER 105611
AMT & TYPE OF CUSHION	
MUD RESISTIVITY @25°C	
INTERVAL/PERFORATIONS FROM	633 m
TO	641 m
TYPE OF PRODUCTION: PUMPING	
FLOWING	
GAS LIFT	
SWAB	
PRODUCTION RATES: WATER	m³/d
OIL	m³/d
GAS	10³m³/d
GAUGE PRESSURE - KPa: SEPARATOR	4200
TREATER	
AS RECEIVED	
TEMPERATURES °C: SEPARATOR	
TREATER	
AS RECEIVED	
DATE SAMPLED Y M D H:M	89-02-06
DATE RECEIVED Y M D	89-02-10
DATE REPORTED Y M D	89-02-13
ANALYST	S.D.

ION	C g.m⁻³	MASS FRACTION	C mol.m⁻³
Na	3800		165.2
K	47		1.2
Ca	5		<1
Mg	49		2.0
Ba			
Sr			
Fe	<1		

ION	C g.m⁻³	MASS FRACTION	C mol.m⁻³
Cl	3716		104.7
Br			
I			
HCO_3	3961		64.9
SO_4	50		<1
CO_3	303		5.1
OH	<1		
H_2S	ABSENT		

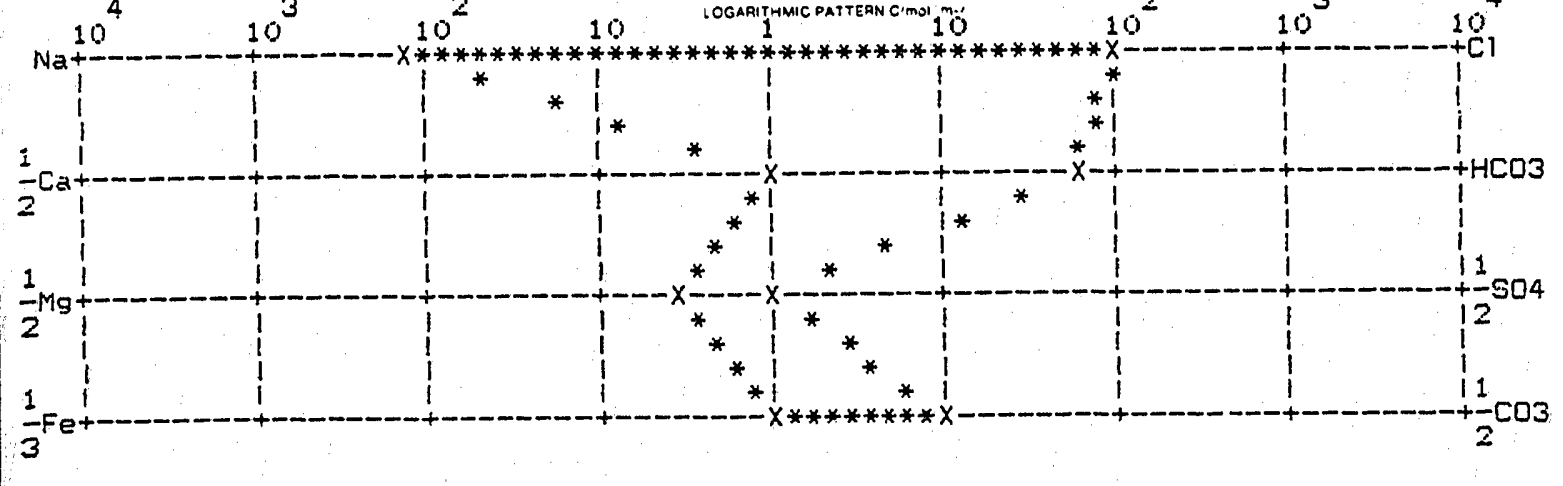
TOTAL SOLIDS C g.m⁻³

BY EVAPORATION @ 110°C	BY EVAPORATION @ 180°C
AT IGNITION	CALCULATED
10508	9918

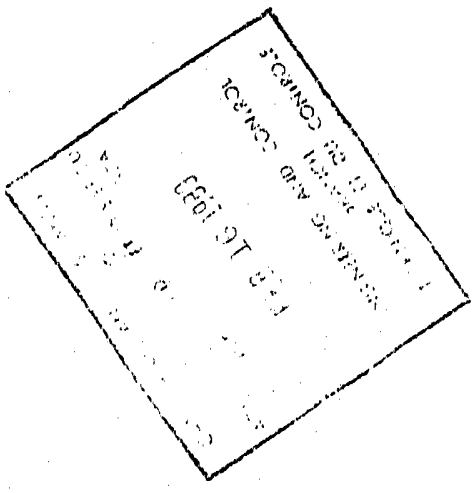
PROPERTIES

RELATIVE DENSITY	REFRACTIVE INDEX
1.007 @ 25 °C	1.334 @ 25°C
OBSERVED PH	RESISTIVITY Ωm
9.1 @ 25 °C	0.620 @ 25°C

LOGARITHMIC PATTERN C/mol.m⁻³



REMARKS



9811-54-2-7

CHEMEX Labs Alberta Inc.

GAS ANALYSIS

OTTAWA COPY

CONTAINER IDENTITY: 131869,16560
SAMPLE POINT I.D. #:
LABORATORY NUMBER: 88-3457-3
LICENCE NO:
OPERATOR NAME AND ADDRESS: SHELL CANADA LIMITED
CPA NUMBER:
WELL NAME: SHELL ET AL ARROWHEAD B-41 60-30N-122-53W
ELEVATIONS METERS: KB 519.99 GRD 512.38
FIELD OR AREA: ARROWHEAD
POOL OR ZONE: BASAL QUARTZ
NAME OF SAMPLER:
COMPANY: SCHLUMBERGER

TEST TYPE: DST
NO: 02
MULTIPLE RECOVERY:
INTERVAL PERFORATIONS
FROM: 621 m
TO: 632 m

TEST RECOVERY: BLACKISH SALT WATER
SAMPLING POINT: BOTTOM SAMPLER 131869
AMT & TYPE OF CUSHION:
MUD RESISTIVITY @25° C:

TYPE OF PRODUCTION
PUMPING: FLOWING: GAS LIFT: SWAB:

PRODUCTION RATES
WATER: m³/d OIL: m³/d GAS: 10³m³/d

GAUGE PRESSURE - KPa
SEPARATOR: 3000 TREATER: AS RECEIVED: 3000

TEMPERATURES °C
SEPARATOR: TREATER: AS RECEIVED:

DATE SAMPLED Y M D H:M: 89-02-08
DATE RECEIVED Y M D: 89-02-10
DATE REPORTED Y M D: 89-02-13
ANALYST: P.K.

COMP	MOL FRACTION AIR FREE AS REC'D	MOL FRACTION AIR FREE ACID GAS FREE	LIQUID VOLUME ml. m³ AIR FREE AS REC'D
H_2	TRACE	TRACE	
He	TRACE	TRACE	
N_2	0.0026	0.0026	
CO_2	0.0119	0.0000	
H_2S	0.0000	0.0000	
C_1	0.9837	0.9956	
C_2	0.0011	0.0011	
C_3	0.0005	0.0005	1.80
iC_4	0.0001	0.0001	0.43
nC_4	0.0001	0.0001	0.41
iC_5	0.0000	0.0000	0.00
nC_5	TRACE	TRACE	TRACE
C_6	TRACE	TRACE	TRACE
C+	0.0000	0.0000	0.00
C_7			
C_8			
C_9			
TOTAL	1.0000	1.0000	2.64

PROPERTIES

RELATIVE DENSITY

MOISTURE FREE AS SAMPLED		MOISTURE AND ACID GAS FREE	
MEASURED	CALCULATED	MEASURED	CALCULATED
	0.568		0.556

CALCULATED PSEUDO CRITICAL PROPERTIES

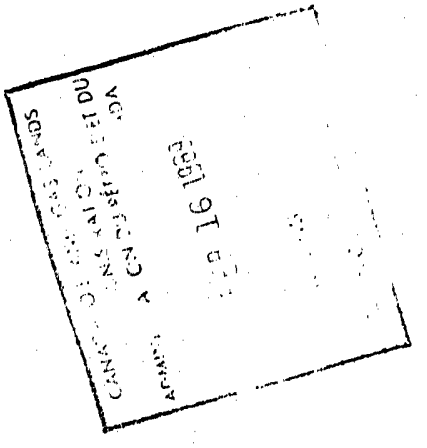
AS SAMPLED		ACID GAS FREE	
pPc	pTc	pPc	pTc
4633.9	192.0	4600.8	190.6

CALCULATED GROSS HEATING VALUE (MJ/m³)

@ 101.35 KPA @ 15 °C		@ 14.65 PSIA @ 60 °F DRY	
A.P.M.C. (AGA #5)	MOISTURE AND ACID GAS FREE	ACID GAS FREE	ACID GAS INCL
37.29	37.67	37.48	37.04

REMARKS

BOTTOM SAMPLERS CONTAINED GAS ONLY.


CANADA OIL AND GAS LANDS
A CANADIAN

921-S6-2-1

CHEMEX — Labs Alberta Inc.

WATER ANALYSIS

OTTAWA COPY

CONTAINER IDENTITY	SAMPLE POINT I.D. #	LABORATORY NUMBER
131869,16560		88-3457-4

LICENCE NO.:

OPERATOR NAME AND ADDRESS: SHELL CANADA LIMITED

CPA NUMBER:

WELL NAME: SHELL ET AL ARROWHEAD B-41 60-30N-122-53W

ELEVATIONS METERS — KB: 519.99 GRD: 512.38

FIELD OR AREA	POOL OR ZONE	NAME OF SAMPLER	COMPANY
ARROWHEAD	BASAL QUARTZ		SCHLUMBERGER

TEST RECOVERY: BLACKISH SALT WATER

TEST TYPE: DST — NO: 02 — MULTIPLE RECOVERY:

INTERVAL PERFORATIONS: FROM 621 m — TO 632 m

SAMPLING POINT: BOTTOM SAMPLER 131869

AMT & TYPE OF CUSHION:

MUD RESISTIVITY: @25° C

TYPE OF PRODUCTION: PUMPING — FLOWING — GAS LIFT — SWAB

PRODUCTION RATES: WATER m³/d — OIL m³/d — GAS 10³m³/d

GAUGE PRESSURE - KPa: SEPARATOR 3000 — TREATER — AS RECEIVED

TEMPERATURES °C: SEPARATOR — TREATER — AS RECEIVED

DATE SAMPLED (Y M D H:M)	DATE RECEIVED (Y M D)	DATE REPORTED (Y M D)	ANALYST
89-02-08	89-02-10	89-02-13	S.D.

ION	C g m⁻³	MASS FRACTION	C mol. m⁻³
Na	825		35.9
K	20		<1
Ca	9		<1
Mg	7		<1
Ba			
Sr			
Fe	<1		

ION	C g m⁻³	MASS FRACTION	C mol. m⁻³
Cl	72		2.0
Br			
I			
HCO_3	1384		22.7
SO_4	40		<1
CO_3	255		4.3
OH	<1		
H_2S	ABSENT		

TOTAL SOLIDS C g m⁻³

BY EVAPORATION @ 110 °C	BY EVAPORATION @ 180 °C

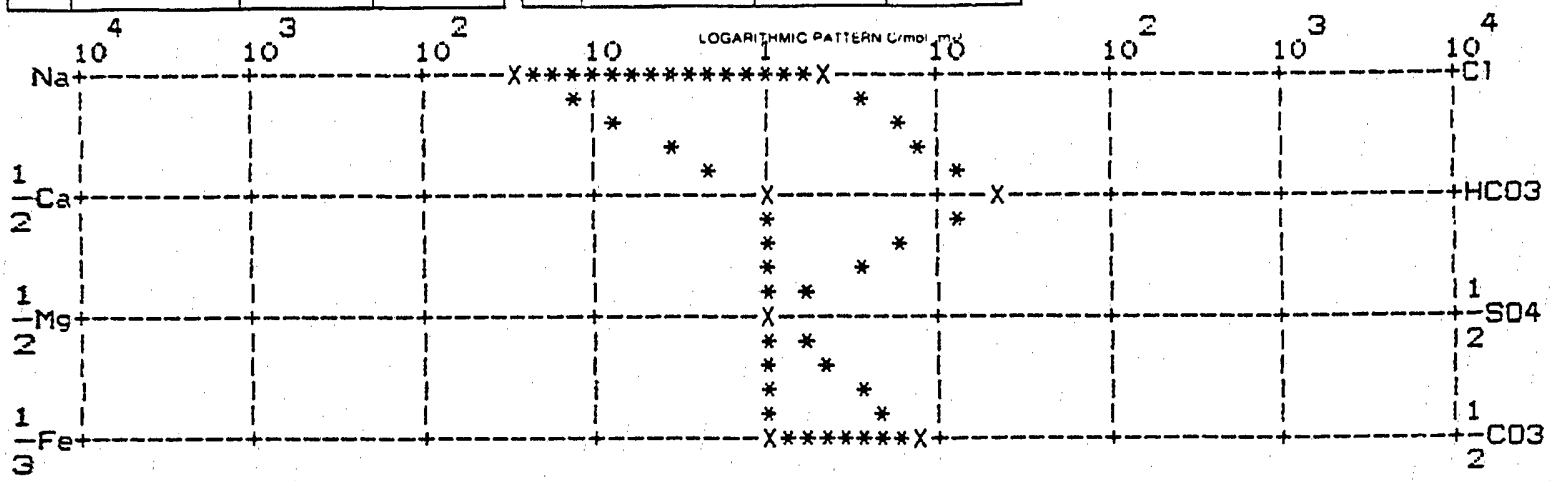
AT IGNITION	CALCULATED
3412	1909

PROPERTIES

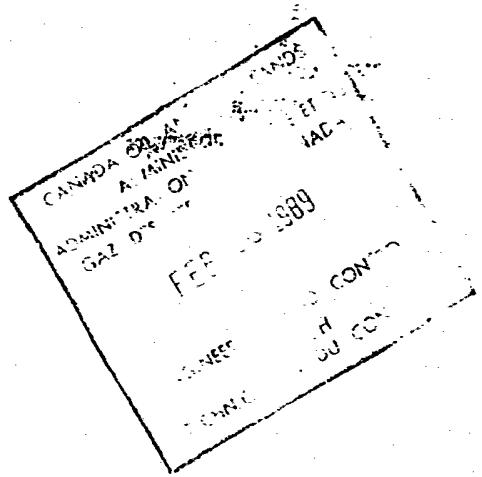
RELATIVE DENSITY	REFRACTIVE INDEX
1.001 @ 25 °C	1.333 @ 25 °C

OBSERVED PH	RESISTIVITY Ωm
9.4 @ 25 °C	3.100 @ 25 °C

LOGARITHMIC PATTERN C/mol m⁻³



REMARKS


CANADA
ADMINISTRATION
FEB 1989

CORE

REPORT

OTTAWA COPY

9211-56-X-1

Canada Lands
MAR 1 1989
Top
File No

SHELL CANADA LIMITED

CALGARY RESEARCH CENTRE

ROUTINE CORE SERVICES SECTION

DATE: 89 02 20

WELL CODE: AC89

ANALYSIS OF CORE FROM: SHELL ARROWHEAD B-41

UWI: 300B416040122450

FORMATION: BASAL QUARTZ - Kbq

CORE TYPE: CONVENTIONAL

CORE #1 INTERVAL: 597.00 TO 615.00 (18.00) RECOVERED: 18.00m

CORE #2 INTERVAL: 615.00 TO 633.25 (18.25) RECOVERED: 18.25m

CORE DIAMETER: 100mm

CORING FLUID: WATER BASE MUD

CORE SAMPLE PREPARATION

EXTRACTION SOLVENT: TOLUENE

EXTRACTION TIME: 36 HOURS

DRYING PROCEDURE: CONVECTION OVEN - FOUR DAYS @ 110 DEG. C.

CORE SAMPLE ANALYSIS

BULK VOLUME MEASURED BY : CALIPER

GRAIN VOLUME MEASURED BY : BOYLE'S LAW HELIUM POROSIMETER (WHOLE CORE)
HYDROSTATIC WEIGHING (SMALL CORE)

PORE VOLUME DETERMINED BY DIFFERENCE (BV-GV)

PERMEABILITIES ARE MEASURED USING AIR AND ARE NOT CORRECTED FOR GAS SLIPPAGE.
ALL MEASUREMENTS ARE MADE AT ATMOSPHERIC PRESSURE CONDITIONS.

COMMENTS

52 WHOLE CORE - 5 PLUGS

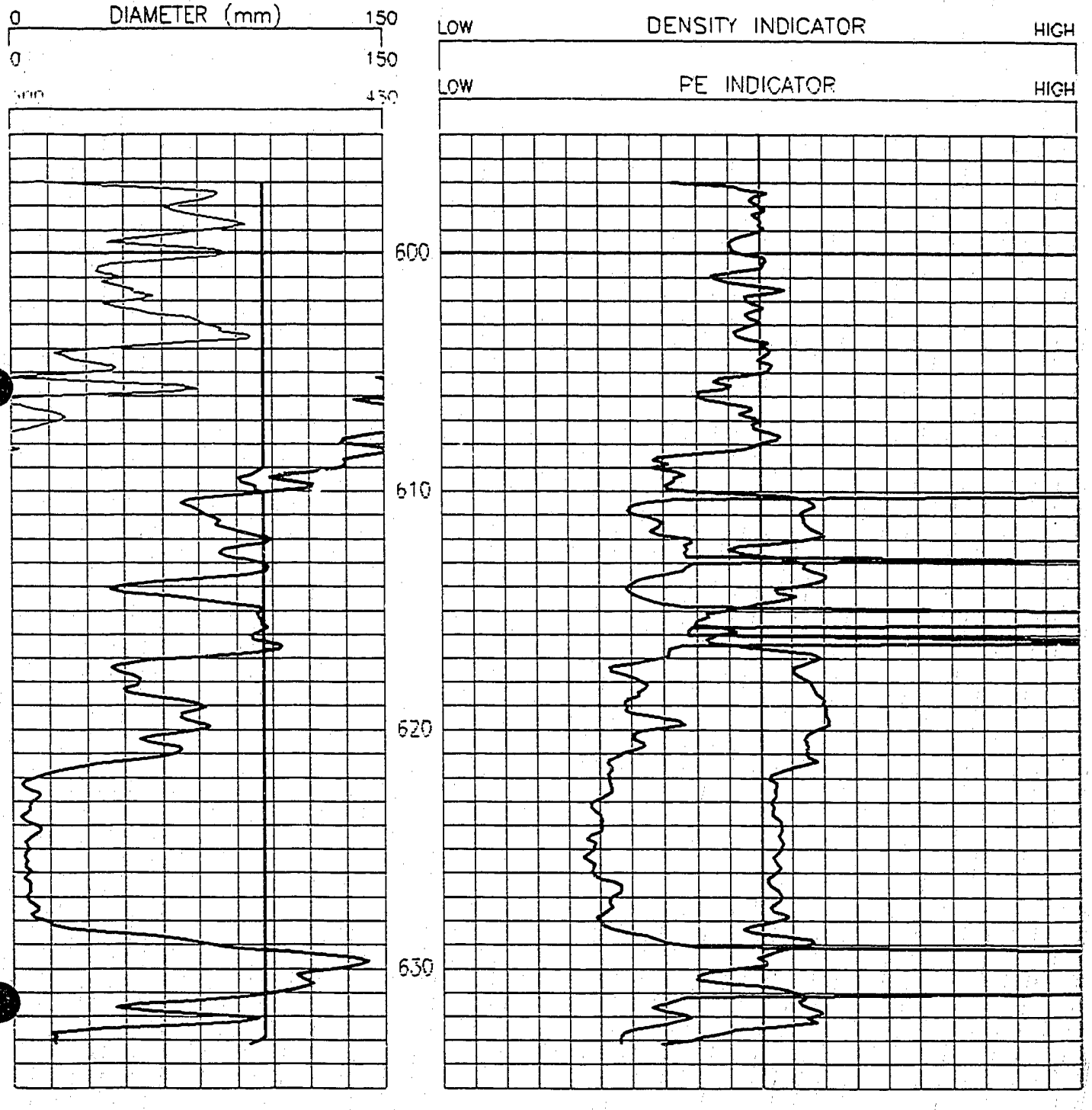
* HIGH GRAIN DENSITIES IN SAMPLE AC-8 AND 1-6547 ARE CAUSED BY COAL BANDS.

SHELL CANADA LIMITED
CALGARY RESEARCH CENTRE

SPECTRAL GAMMA RAY

Well Name: SHELL ARROWHEAD B-41
UWI: 300B4160401224500
Formation: (BASAL QUARTZ Kbq)
Field: ARROWHEAD

Date: 890215
Well Code: AC89

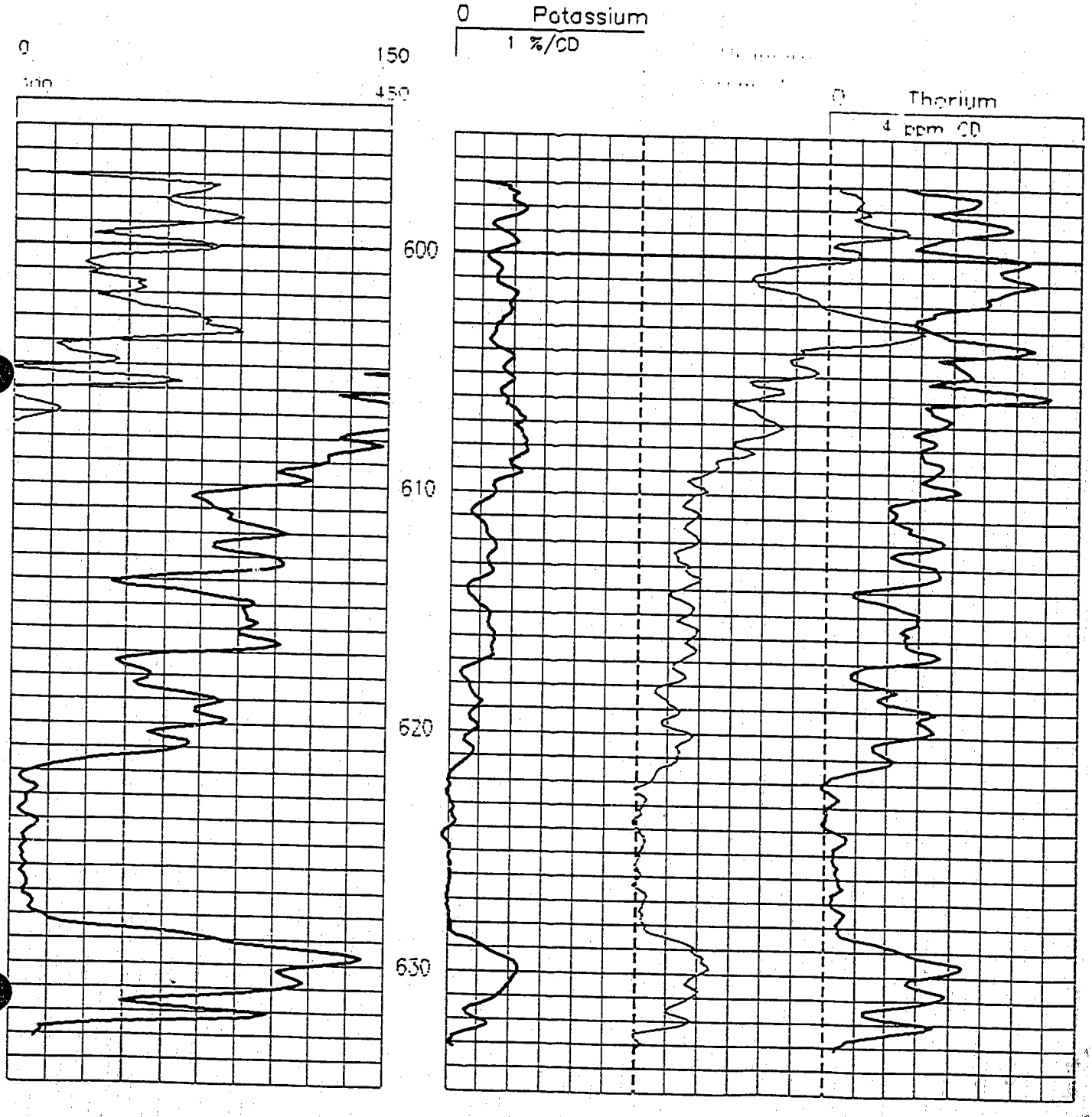


SHELL CANADA LIMITED
CALGARY RESEARCH CENTRE

SPECTRAL GAMMA RAY

Well Name: SHELL ARROWHEAD B-41
UWI: 300B416040122450O
Formation: (BASAL QUARTZ Kbq)
Field: ARROWHEAD

Date: 890215
Well Code: AC89



CORE ANALYSIS REPORT

WELL: SHELL ARROWHEAD B-41
UWI: 300B4160401224500
FIELD: ARROWHEAD
FORMATION: (BASAL QUARTZ Kbq)

DATE: 890215
WELL CODE: AC89
K. B: 520.00

SAMPLE NO	INT TOP (m)	INT THCK (m)	PORO (VF)	K-MAX (mD)	K-90 (mD)	GRN DENS (sg)	OIL SAT (VF)	H2O SAT (VF)	F L R	LITHOLOGY	OR	T Y P
CORE # 1	FROM	597.00	TO	615.00	CORE RECOVERY:	18.00						
-	597	13.45	SECTION DENSE									10
AC-1	610.45	.3	.081	15.5 F*	8.8 F	2.56	.469	.421		SL,SI,SH,CON,P	1	6
AC-2	610.75	.25	.082	1.53F	1.46F*	2.52				SL,SI,SH,CON,P	1	6
AC-3	611	.25	.053	4.01F	3.78F*	2.54				SL,SI,SH,CON,P	1	6
AC-4	611.25	.25	.074	10.6 F*	2.65F	2.57	.284	.478		SL,SI,PB,CON,P	1	6
AC-5	611.5	.3	.058	3.36F	2.68F*	2.57	.07	.689		SL,SI,PB,CON,P	1	6
AC-6	611.8	.32	.05	114 F*	29 F	2.58				SL,SI,PB,CON,P	1	6
-	612.12	1.8	SECTION DENSE									10
AC-7	613.92	.55	.096	2.92F*	2.13F	2.55	.112	.458		SL,SI,SH,CON,P	2	6
-	614.47	.04	PYROBITUMEN BAND									14
AC-8	614.51	.14	.084	no test	no test	2.32	.004	.522		SL,SI,PB,SH,P	2	6
AC-9	614.65	.35	.042	5.28 *	1.53	2.67				SL,SI,PB,CON,P	2	6
-			END CORE #1									13
CORE # 2	FROM	615.00	TO	633.25	CORE RECOVERY:	18.25						
-	615	1.45	SECTION DENSE									10
AC-10	616.45	.3	.054	12.2 F	8.82F*	2.63	.13	.376		SL,SI,CON,P	3	6
AC-11	616.75	.3	.096	.51F*	.46F	2.62	.02	.266		SL,SI,CON,P	3	6
AC-12	617.05	.35	.134	1 F*	.64F	2.64	.013	.185		SS,SI,VF,P	3	6
AC-13	617.4	.35	.118	1.85F*	1.12F	2.62	.025	.239		SS,SI,VF,P	3	6
AC-14	617.75	.25	.116	1.35F*	.89F	2.63	.027	.187		SS,SI,VF,P	3	6
AC-15	618	.25	.123	2.5 F*	1.43F	2.63	.02	.174		SS,SI,VF,P	3	6
AC-16	618.25	.35	.09	26.2 F*	11 F	2.63	.107	.228		SS,SI,VF,P	3	6
AC-17	618.6	.25	.083	1.94F*	1.81F	2.63	.077	.256		SS,SI,VF-F,P	3	6
AC-18	618.85	.25	.084	2.01F*	.79F	2.63	.035	.261		SS,SI,VF,PB,P	3	6
AC-19	619.1	.25	.093	305 F	32.1 F*	2.62	.022	.258		SS,SI,VF,P	3	6
AC-20	619.35	.45	.077	12.6 F	9.8 F*	2.61	.015	.257		SL,SI,CON,P	3	6
AC-21	619.8	.2	.115	37.3 F	11 F*	2.63	.014	.177		SS,SI,VF-F,P	3	6
AC-22	620	.35	.101	10.6 F	4.24F*	2.62	.023	.237		SS,SI,VF,PB,P	3	6
AC-23	620.35	.25	.088	1.69F	.78F*	2.62	.012	.272		SS,SI,VF,PB,P	3	6
AC-24	620.6	.3	.092	1.27	1.15 *	2.63	.026	.215		SS,SI,F-VF,P	3	6
AC-25	620.9	.3	.092	2.64	2.23 *	2.63	.012	.219		SS,SI,F-VF,P	3	6
AC-26	621.2	.2	.118	26.3 F*	25.3 F	2.64	.002	.139		SS,SI,F,G	3	6
AC-27	621.4	.35	.177	817 *	408	2.64	.007	.092		SS,SI,F,G	3	6
AC-28	621.75	.25	.195	819 F	803 F*	2.63	.039	.038		SS,SI,F,G	4	6
AC-29	622	.25	.166	430 F*	410 F	2.6	.06	.025		SS,SI,PB,F,G	4	6
AC-30	622.25	.25	.183	377 F*	343 F	2.63	.012	.04		SS,SI,PB,F,G	4	6
AC-31	622.5	.25	.188	697 *	692	2.62	.028	.044		SS,SI,PB,F,G	4	6
AC-32	622.75	.25	.179	735	551 *	2.59	.054	.033		SS,SI,PB,F,G	4	6
AC-33	623	.4	.198	936	863 *	2.62	.023	.046		SS,SI,PB,F,G	4	6
AC-34	623.4	.35	.194	819 *	547	2.62	.01	.038		SS,SI,PB,F,G	4	6
AC-35	623.75	.25	.186	96900 F	967 F*	2.62	.038	.064		SS,SI,PB,F-VF,G	4	6
AC-36	624	.25	.155	171	170 *	2.53	.157	.04		SS,SI,PB,F-VF,G	4	6
AC-37	624.25	.2	.156	2430 F	184 F*	2.52	.252	.045		SS,SI,PB,F-VF,G	4	6
AC-38	624.45	.2	.14	96.5 *	88.1	2.54	.248	.052		SS,SI,PB,F-VF,G	4	6
AC-39	624.65	.35	.135	63.7 *	60.3	2.53	.183	.04		SS,SI,PB,F-VF,G	4	6
AC-40	625	.25	.153	115	115 *	2.55	.131	.046		SS,SI,PB,F-VF,G	4	6
AC-41	625.25	.25	.167	154	148 *	2.61	.053	.031		SS,SI,PB,F-VF,G	4	6
AC-42	625.5	.3	.182	398 F	346 F*	2.62	.044	.05		SS,SI,PB,VF-F,G	4	6
AC-43	625.8	.45	.186	305 F	278 F*	2.64	.002	.048		SS,SI,F,G	4	6

CORE ANALYSIS REPORT

WELL: SHELL ARROWHEAD B-41
UWI: 300B4160401224500 DATE: 890215
FIELD: ARROWHEAD WELL CODE: AC89
FORMATION: (BASAL QUARTZ Kbq) K. B: 520.00

SAMPLE NO	INT TOP (m)	INT THCK (m)	PORO (VF)	K-MAX (mD)		K-90 (mD)		GRN DENS (sg)	OIL SAT (VF)	H2O SAT (VF)	F L R	LITHOLOGY	OR	T Y P
AC-44	626.25	.35	.182	1190	*	1020		2.64	.001	.041		SS,SI,U,F,G	5	6
AC-45	626.6	.3	.175	318		294	*	2.65	.005	.041		SS,SI,U,F,G	5	6
AC-46	626.9	.3	.176	469	F*	453	F	2.64	.002	.042		SS,SI,U,F,G	5	6
AC-47	627.2	.5	.175	374		364	*	2.64	.005	.048		SS,SI,U,F,G	5	6
AC-48	627.7	.4	.158	200	F	195	F*	2.64	.011	.044		SS,SI,U,VF-F,G	5	6
1-6547	628.1	.12	.126	24.8		no test		2.18				SS,SI,U,PB,F,G	5	1
1-6548	628.22	.1	.172	382		no test		2.59				SS,SI,U,PB,F,G	5	1
AC-49	628.32	.13	.181	12600	F	691	F*	2.53	.038	.076		SS,SI,U,MED,G	5	6
-	628.45	2.75	SECTION DENSE											10
AC-50	631.2	.3	.085	7.55	F	5.6	F*	2.59	.177	.17		SL,SI,PB,CON,P	6	6
AC-51	631.5	.32	.08	7.41	F*	5.06	F	2.57	.149	.2		SL,SI,PB,PY,P	6	6
1-6549	631.82	.58	.115	3.89	F	no test		2.57				SS,SI,VF-GRAN,G	7	1
1-6550	632.4	.3	.136	328		no test		2.64				SS,SI,VF-GRAN,G	7	1
AC-52	632.7	.3	.136	41.7	F	29.1	F*	2.62	.005	.157		SS,SI,VF-GRAN,G	8	6
1-6551	633	.25	.147	34	F	no test		2.61				SS,SI,VF-GRAN,G	9	1
-			END CORE #2											13

(1) similar numbers indicate continuous orientation

F	fractured	Y	yes	N	no	FR	friable
U	unconsol.	SS	sandstone	LS	limestone	DO	dolomite
AN	anhydrite	SL	siltstone	SH	shale	CO	conglomerate
CC	calcite	CL	clean	CA	calcareous	CH	cherty
SI	siliceous	STY	silty	SHY	shaly	PY	pyritic
GL	glauconite	ST	stylolite	PB	pyrobitumen		
L	large	M	medium	F	fine	VF	very fine
N	none	P	poor	G	good	E	excellent

roman numerals and letters are Archie classification
* indicates direction of orientation lines.
*** indicates permeability greater than 1000md.

HEIGHT TIMES POROSITY & PERMEABILITY REPORT

WELL: SHELL ARROWHEAD B-41
UWI: 300B4160401224500
FIELD: ARROWHEAD
FORMATION: (BASAL QUARTZ Kbq)

DATE: 890215
WELL CODE: AC89
K. B: 520.00

SAMPLE NO	INT TOP (m)	INT THCK (m)	PORO (VF)	H*PORO	K-MAX (mD)	H*K-MAX	K-90 (mD)	H*K-90	TYP
AC-1	610.45	.3	.081	.024	15.5	4.65	8.8	2.64	6
AC-2	610.75	.25	.082	.02	1.53	.38	1.46	.37	6
AC-3	611	.25	.053	.013	4.01	1	3.78	.94	6
AC-4	611.25	.25	.074	.018	10.6	2.65	2.65	.66	6
AC-5	611.5	.3	.058	.017	3.36	1.01	2.68	.8	6
AC-6	611.8	.32	.05	.016	114	36.5	29	9.27	6
AC-7	613.92	.55	.096	.053	2.92	1.6	2.13	1.17	6
AC-8	614.51	.14	.084	.012	no test	1400	no test	1400	6
AC-9	614.65	.35	.042	.015	5.28	1.85	1.53	.53	6
AC-10	616.45	.3	054	.016	12.2	3.65	8.82	2.65	6
AC-11	616.75	.3	.096	.029	.51	.15	.46	.14	6
AC-12	617.05	.35	.134	.047	1	.35	.64	.23	6
AC-13	617.4	.35	.118	.041	1.85	.65	1.12	.39	6
AC-14	617.75	.25	.116	.029	1.35	.34	.89	.22	6
AC-15	618	.25	.123	.031	2.5	.62	1.43	.36	6
AC-16	618.25	.35	.09	.031	26.2	9.19	11	3.83	6
AC-17	618.6	.25	.083	.021	1.94	.48	1.81	.45	6
AC-18	618.85	.25	.084	.021	2.01	.5	.79	.2	6
AC-19	619.1	.25	.093	.023	305	76.3	32.1	8.02	6
AC-20	619.35	.45	.077	.035	12.6	5.66	9.8	4.41	6
AC-21	619.8	.2	.115	.023	37.3	7.46	11	2.2	6
AC-22	620	.35	.101	.035	10.6	3.7	4.24	1.48	6
AC-23	620.35	.25	.088	.022	1.69	.42	.78	.19	6
AC-24	620.6	.3	.092	.028	1.27	.38	1.15	.34	6
AC-25	620.9	.3	.092	.028	2.64	.79	2.23	.67	6
AC-26	621.2	.2	.118	.024	26.3	5.26	25.3	5.06	6
AC-27	621.4	.35	.177	.062	817	286	408	143	6
AC-28	621.75	.25	.195	.049	819	205	803	201	6
AC-29	622	.25	.166	.041	430	107	410	102	6
AC-30	622.25	.25	.183	.046	377	94.1	343	85.7	6
AC-31	622.5	.25	.188	.047	697	174	692	173	6
AC-32	622.75	.25	.179	.045	735	184	551	138	6
AC-33	623	.4	.198	.079	936	374	863	345	6
AC-34	623.4	.35	.194	.068	819	287	547	192	6
AC-35	623.75	.25	.186	.046	96900	24200	967	242	6
AC-36	624	.25	.155	.039	171	42.7	170	42.6	6
AC-37	624.25	.2	.156	.031	2430	486	184	36.9	6
AC-38	624.45	.2	.14	.028	96.5	19.3	88.1	17.6	6
AC-39	624.65	.35	.135	.047	63.7	22.3	60.3	21.1	6
AC-40	625	.25	.153	.038	115	28.7	115	28.7	6
AC-41	625.25	.25	.167	.042	154	38.5	148	37	6
AC-42	625.5	.3	.182	.054	398	119	346	104	6
AC-43	625.8	.45	.186	.084	305	137	278	125	6
AC-44	626.25	.35	.182	.064	1190	417	1020	358	6
AC-45	626.6	.3	.175	.052	318	95.5	294	88.3	6
AC-46	626.9	.3	.176	.053	469	141	453	136	6
AC-47	627.2	.5	.175	.088	374	187	364	182	6
AC-48	627.7	.4	.158	.063	200	79.8	195	78	6
1-6547	628.1	.12	.126	.015	24.8	2.97	no test	1200	1
1-6548	628.22	.1	.172	.017	382	38.2	no test	1000	1

HEIGHT TIMES POROSITY & PERMEABILITY REPORT

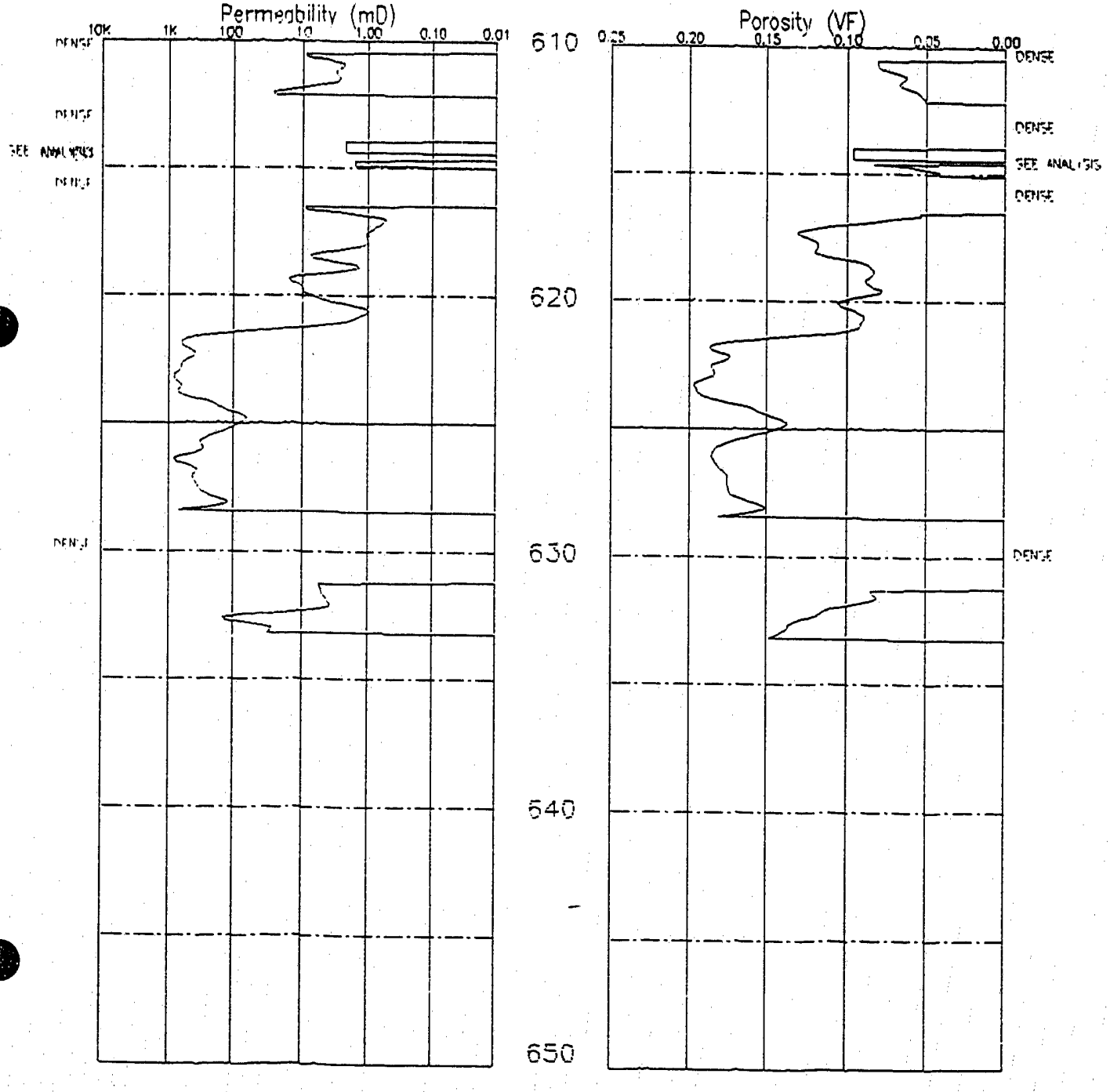
WELL: SHELL ARROWHEAD B-41
UWI: 300841604012245OO DATE: 890215
FIELD: ARROWHEAD WELL CODE: AC89
FORMATION: (BASAL QUARTZ Kbq) K. B: 520.00

SAMPLE NO	INT TOP (m)	INT THCK (m)	PORO (VF)	H*PORO	K-MAX (mD)	H*K-MAX	K-90 (mD)	H*K-90	TYP
AC-49	628.32	.13	.181	.024	12600	1640	691	89.8	6
AC-50	631.2	.3	.085	.026	7.55	2.26	5.6	1.68	6
AC-51	631.5	.32	.08	.026	7.41	2.37	5.06	1.62	6
1-6549	631.82	.58	.115	.067	3.89	2.26	no test	5800	1
1-6550	632.4	.3	.136	.041	328	98.3	no test	3000	1
AC-52	632.7	.3	.136	.041	41.7	12.5	29.1	8.74	6
1-6551	633	.25	.147	.037	34	8.5	no test	2500	1

SHELL CANADA LIMITED
CALGARY RESEARCH CENTRE
ROUTINE CORE SMOOTHED DEPTH PLOT

Well Name: SHELL ARROWHEAD B-41
UWI: 300B416040122450O
Formation: BASAL QUARTZ Kbq

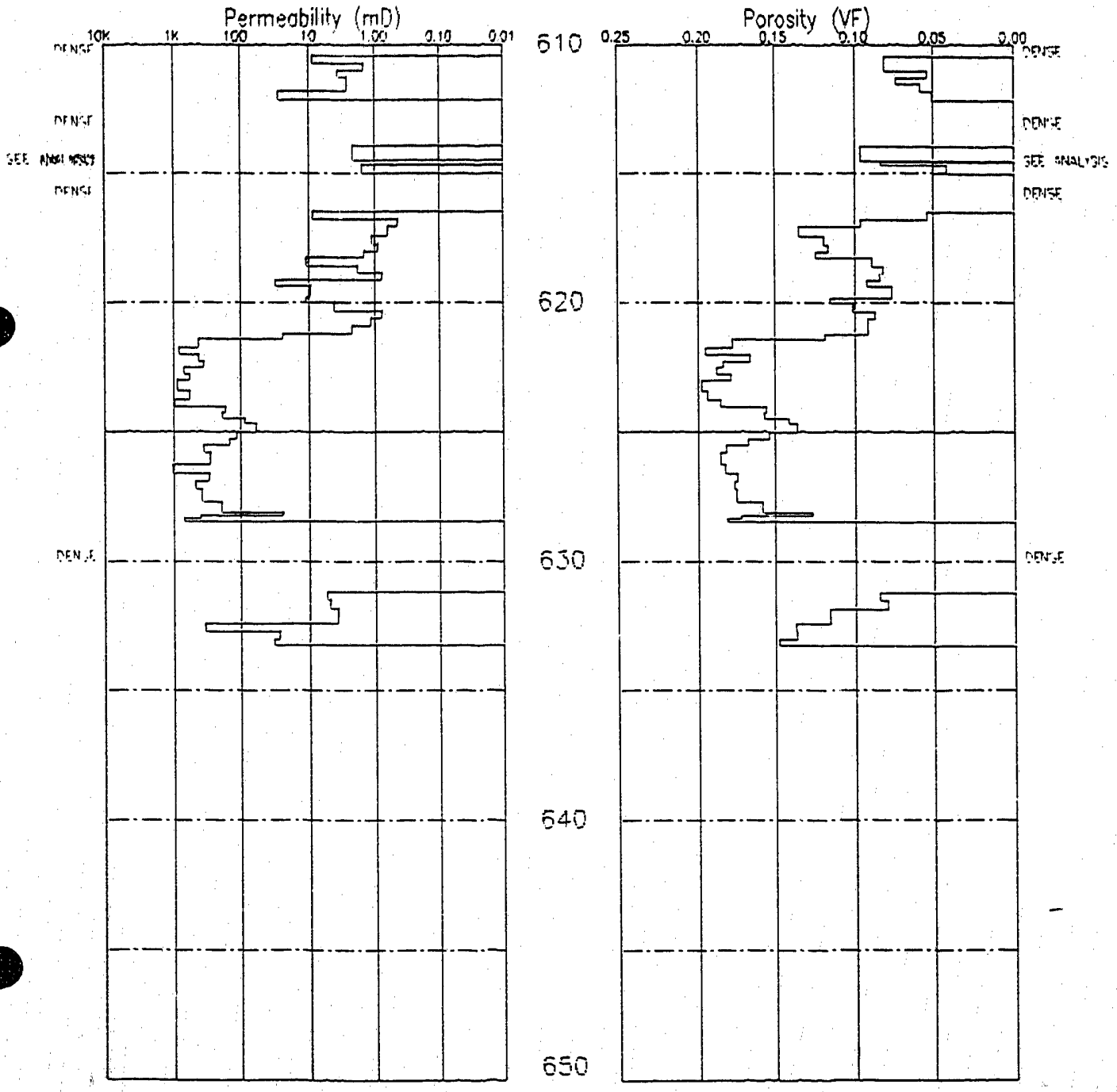
Date: 890215
Well Code: AC89
Field: ARROWHEAD



SHELL CANADA LIMITED
CALGARY RESEARCH CENTRE
ROUTINE CORE UNSMOOTHED DEPTH PLOT

Well Name: SHELL ARROWHEAD B-41
UWI: 300B4160401224500
Formation: BASAL QUARTZ Kbq

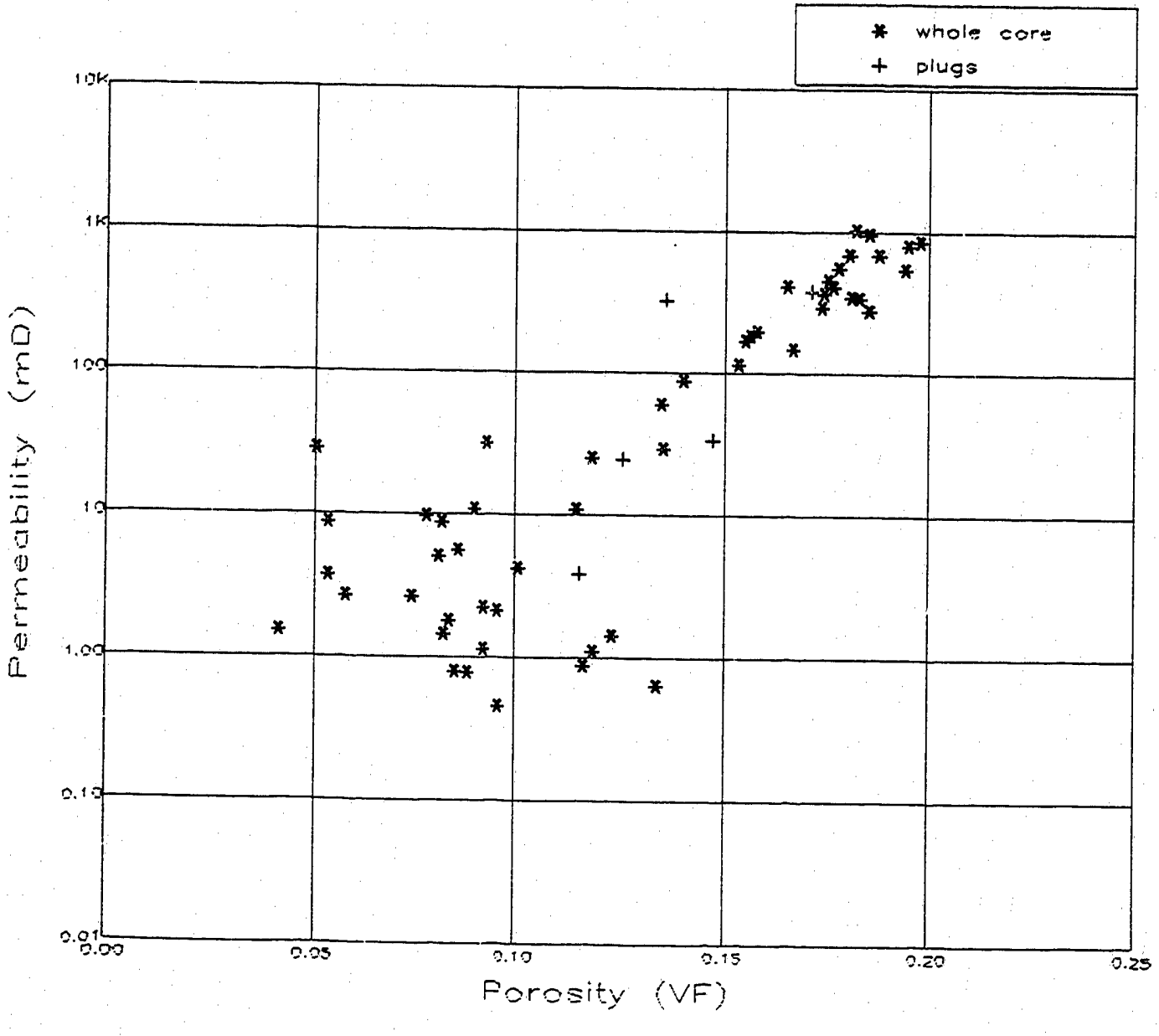
Date: 890215
Well Code: AC89
Field: ARROWHEAD



SHELL CANADA LIMITED
CALGARY RESEARCH CENTRE
ROUTINE CORE SCATTER PLOT

Well Name: SHELL ARROWHEAD B-41
UWI: 300B4160401224500
Formation: BASAL QUARTZ Kbq

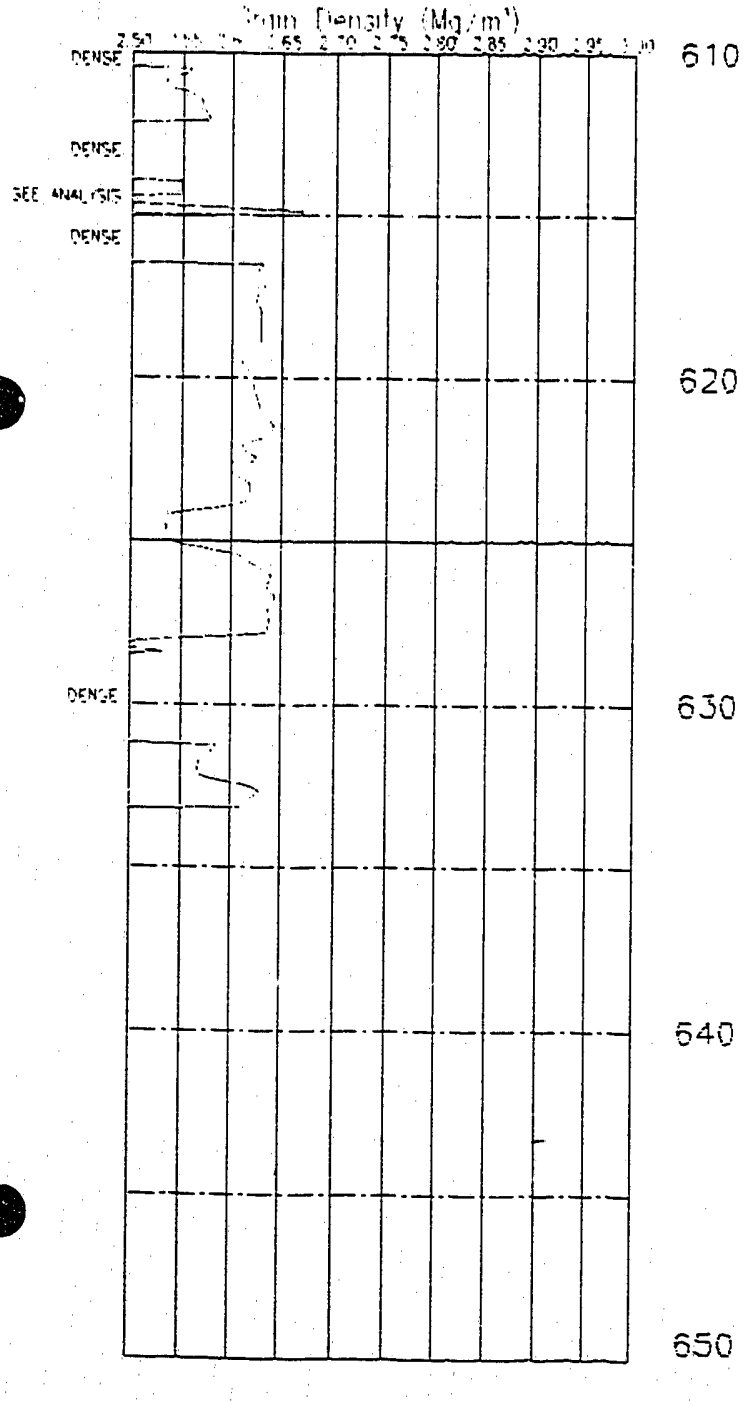
Date: 890215
Well Code: AC89
Field: ARROWHEAD



SHELL CANADA LIMITED
CALGARY RESEARCH CENTRE
ROUTINE CORE SMOOTHED DEPTH PLOT

Well Name: SHELL ARROWHEAD B-41
UWI: 300B416040122450O
Formation: BASAL QUARTZ Kbq

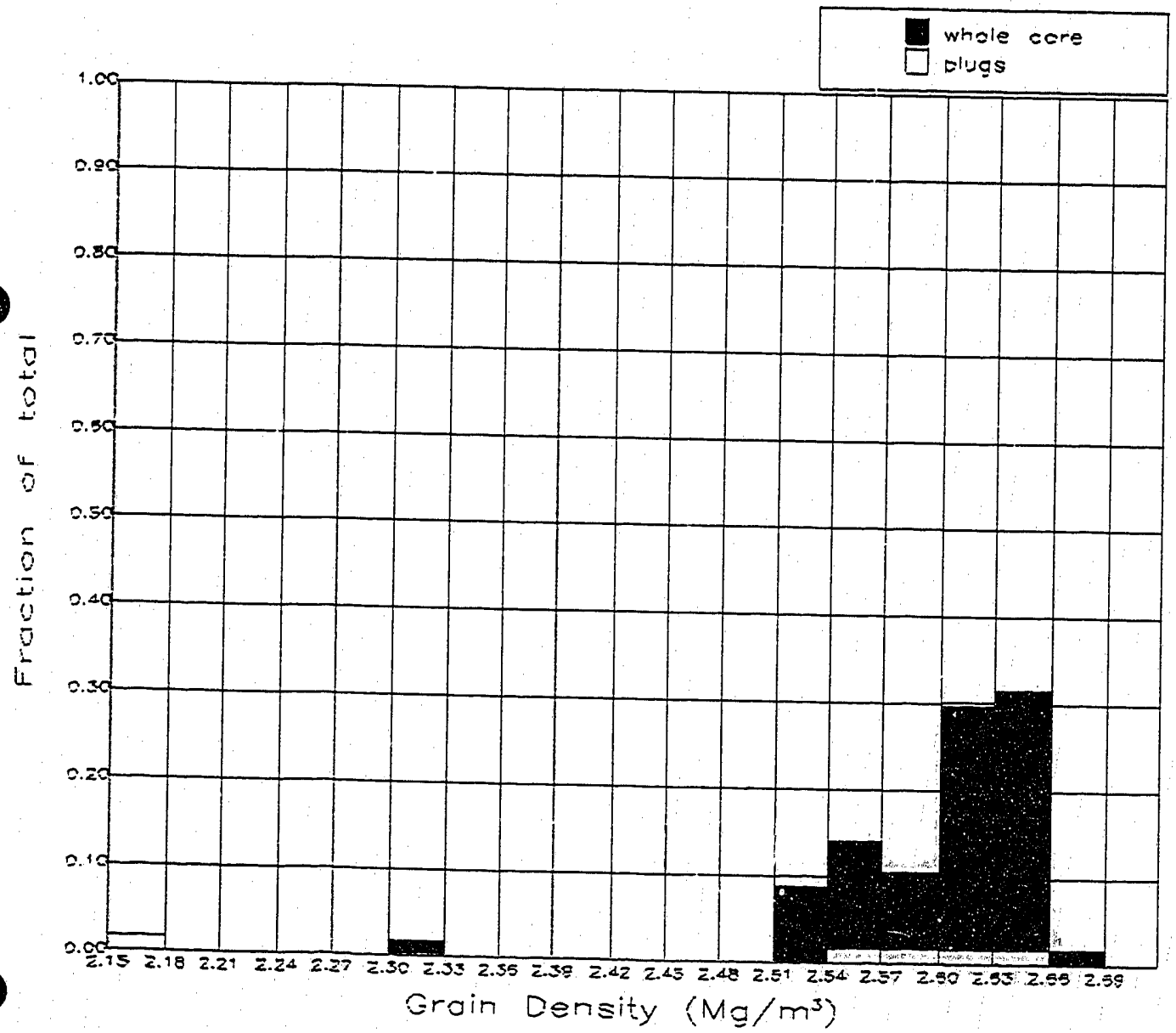
Date: 890215
Well Code: AC89
Field: ARROWHEAD



SHELL CANADA LIMITED
CALGARY RESEARCH CENTRE
ROUTINE CORE HISTOGRAM

Well Name: SHELL ARROWHEAD B-41
UWI: 300B416040122450O
Formation: BASAL QUARTZ Kbq

Date: 890215
Well Code: AC89
Field: ARROWHEAD



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TECHNIQUE ET CONTRÔLE

SHELL CANADA LIMITED CALGARY RESEARCH CENTER
CORE SERVICES SECTION

CORE ANALYSIS REPORT

WELL: SHELL ARROWHEAD B-41
UWI: 300B41604012245OO
FIELD: ARROWHEAD
FORMATION: (MANETOE - Dmnt)

DATE: 890302
WELL CODE: AF89
K. B: 520.00

SAMPLE NO	INT TOP (m)	INT THCK (m)	PORO (vF)	K-MAX (mD)	K-90 (mD)	GRN DENS (sg)	OIL SAT (VF)	H2O SAT (VF)	F L R	LITHOLOGY	OR	T V P
CORE # 3 FROM 2855.00 TO 2869.80 CORE RECOVERY: 14.15												
AF-1	2855	.5	.013	88.4 F*	.17F*	2.74				LS.I.A	1	5
AF-2	2855.5	.5	.007	79 F	65 F*	2.76				LS.PY.I.A	1	5
AF-3	2856	.75	.008	62.3 F	28.8 F*	2.73				LS.I.A	1	5
AF-4	2856.75	.25	0	50 F*	42.1 F	2.73				LS.I.A	1	5
AF-5	2857	.4	.002	1.64F*	1.05F	2.7				LS.PY.I.A	1	5
AF-6	2857.4	.4	.001	5.19F*	.63F	2.72				LS.PY.I.A	1	5
AF-7	2857.8	.5	.009	5.83F*	4.02F	2.72				LS.PY.I.A	1	5
AF-8	2858.3	.7	.017	389 F	118 F*	2.75				LS.I.A	1	5
AF-9	2859	.5	.038	.51F*	.4 F	2.72				LS.I.A	2	5
AF-10	2859.5	.25	.001	.08 *	.03	2.71				LS.I.A	2	5
AF-11	2859.75	.35	.006	.03	.02 *	2.72				LS.I.A	2	5
AF-12	2860.1	.15	.017	57.8 F	34.1 F*	2.8				DO.I-I/III.A	2	5
AF-13	2860.25	.25	.032	244 F	39.8 F*	2.84				DO.I-I/III.A	2	5
AF-14	2860.5	.4	.017	9.68F*	5.33F	2.84				DO.I-I/III.A	2	5
AF-15	2860.9	.1	.019	47.8 F	17.5 F*	2.86				DO.PY.I-I/III.A	2	5
AF-16	2861	.25	.024	132 F*	123 F	2.84				DO.I-I/III.A	2	5
AF-17	2861.25	.25	.021	8.46F	6.57F*	2.83				DO.I-I/III.A	2	5
AF-18	2861.5	.25	.022	24.1 F	18 F*	2.83				DO.I-I/III.A	2	5
AF-19	2861.75	.5	.021	114 F*	76.3 F	2.84				DO.I-I/III.A	2	5
AF-20	2862.25	.5	.029	4.04F*	1.38F	2.84				DO.I-I/III.A	3	5
AF-21	2862.75	.35	.023	34.3 F*	14.5 F	2.82				DO.PB.I/III.A	3	5
AF-22	2863.1	.4	.021	10.6 F*	9.85F	2.83				DO.I/III.A	3	5
AF-23	2863.5	.25	.055	2.02F*	1.88F	2.75				DO.CC.I/III.A	3	5
AF-24	2863.75	.25	.084	53.1 F*	1.46F	2.8				DO.I/III.A	3	5
AF-25	2864	.35	.026	4.41	.73 *	2.83				DO.I/III.C	3	5
AF-26	2864.35	.4	.037	16.7 F	11.4 F*	2.83				DO.I/III.A	3	5
AF-27	2864.75	.25	.019	17.4 F	13.7 F*	2.83				DO.PY.I/III.C	3	5
AF-28	2865	.5	.02	24.5 F	20 F*	2.82				DO.I/III.C	3	5
AF-29	2865.5	.25	.055	1860 F*	875 F	2.86				DO.I/III.B	3	5
AF-30	2865.75	.25	.018	10.4 *	3.61	2.81				DO.I/III.C	3	5
AF-31	2866	.25	.013	.65F	.54F*	2.83				DO.I/III.B	3	5
AF-32	2866.25	.3	.024	83.8 F	31.6 F*	2.84				DO.I/III.A	3	5
AF-33	2866.55	.7	.015	2.15F	1.86F*	2.83				DO.I/III.C	3	5
AF-34	2867.25	.35	.016	10.1 F	6.06F*	2.83				DO.PY.I/III.B	3	5
AF-35	2867.6	.4	.011	133 F*	81.3 F	2.82				DO.I/III.A	3	5
1-6569	2868	1.15	.031	33.3 F	no test	2.85				DO.I/III.C	4	1
-	2869.15	.65	MISSING CORE									9
-			END CORE #3									13
CORE # 4 FROM 2869.80 TO 2887.80 CORE RECOVERY: 18.00												
1-6678	2869.8	.6	.027	209 F	no test	2.85				DO.I/III.C	5	1
AF-36	2870.4	.4	.015	40.3 *	14.1	2.86				DO.I/III.A	5	5
AF-37	2870.8	.48	.038	19.5 F*	7.95F	2.84				DO.I/III.A	6	5
1-6679	2871.28	.24	.04	12 F	no test	2.84				DO.I/III.B	7	1
1-6680	2871.52	.44	.02	.26F	no test	2.84				DO.I/III.B	8	1
AF-38	2871.96	.31	.027	85.2 F*	35.1 F	2.83				DO.I/III.C	9	5
AF-39	2872.27	.28	.015	729 F*	1.44F	2.81				DO.I/III.B	10	5
AF-40	2872.55	.2	.02	16.2 F*	6.4 F	2.82				DO.I/III.A	10	5
AF-41	2872.75	.26	.025	1780 F*	363 F*	2.83				DO.I/III.A	11	5
1-6681	2873.01	.51	.022	.81F	no test	2.84				DO.I/III.B	12	1

CORE ANALYSIS REPORT

WELL: SHELL ARROWHEAD B-41
UWI: 300B416040 1224500
FIELD: ARROWHEAD
FORMATION: (MANETOE - Dmnt)

DATE: 890302
WELL CODE: AF89
K. B: 520.00

SAMPLE NO	INT TOP (m)	INT THCK (m)	PORO (VF)	K-MAX (mD)	K-90 (mD)	GRN DENS (sg)	OIL SAT (VF)	H2O SAT (VF)	F L R	LITHOLOGY	OR	T V P
AF-42	2873.52	.38	.056	2000 F*	3.6 F*	2.84				DO,I-I/III,A	13	5
AF-43	2873.9	.43	.023	39.2 F*	31.4 F	2.81				DO,I-I/III,A	13	5
1-6682	2874.33	.1	.022	.11F	no test	2.84				DO,I-I/III,A	13	1
AF-44	2874.43	.27	.015	20.6 F	9.15F*	2.81				DO,I-I/III,A	13	5
AF-45	2874.7	.3	.016	83.5 F*	40.2 F	2.83				DO,I-I/III,A	13	5
AF-46	2875	.21	.02	73 F*	58 F	2.84				DO,PB,I-I/III,A	13	5
AF-47	2875.21	.36	.017	4.93	3.23 *	2.84				DO,I-I/III,A	13	5
AF-48	2875.57	.58	.015	1.25 *	1.17 *	2.84				DO,I-I/III,A	13	5
AF-49	2876.15	.57	.034	109 F	43.4 F*	2.83				DO,I-I/III,C	14	5
1-6683	2876.72	.3	.041	48.4 F	no test	2.85				DO,I-I/III,A	14	1
AF-50	2877.02	.28	.027	428 F*	64.5 F	2.84				DO,I-I/III,A	14	5
AF-51	2877.3	.3	.03	1590 F	715 F*	2.83				DO,QZ,I-I/III,C	14	5
AF-52	2877.6	.28	.059	2000	7.81 *	2.85				DO,I-I/III,A	14	5
AF-53	2877.88	.62	.03	17.6 F	14 F*	2.84				DO,PB,QZ,I/III	14	5
AF-54	2878.5	.17	.021	5.75 *	1.28	2.86				DO,I-I/III,B	15	5
AF-55	2878.67	.43	.019	3.87 *	3.39	2.86				DO,I-I/III,B	15	5
AF-56	2879.1	.52	.039	407 F*	14.5 F	2.83				DO,PV,I-I/III,B	16	5
AF-57	2879.62	.42	.015	.91 *	.73	2.83				DO,PB,QZ,I/III	16	5
1-6684	2880.04	.16	.044	102 F	no test	2.84				DO,PB,I-I/III,B	16	1
AF-58	2880.2	.3	.034	176 F*	104 F	2.81				DO,PB,I-I/III,C	16	5
AF-59	2880.5	.25	.026	4.67 *	1.85	2.82				DO,PB,I-I/III,C	16	5
1-6685	2880.75	.25	.033	8.39F	no test	2.84				DO,PB,I-I/III,B	16	1
AF-60	2881	.32	.029	499 F*	468 F	2.86				DO,PV,I-I/III,B	16	5
AF-61	2881.32	.43	.021	19 F*	6.29F	2.8				DO,I-I/III,B	16	5
1-6686	2881.75	.12	.026	.47F	no test	2.82				DO,I-I/III,B	16	1
AF-62	2881.87	.43	.018	19.3 F*	19.3 F	2.84				DO,PV,QZ,I/III	16	5
1-6687	2882.3	.22	.013	12.8 F	no test	2.82				DO,PV,I-I/III,B	16	1
AF-63	2882.52	.28	.046	25.7 *	22	2.82				DO,I-I/III,B	16	5
AF-64	2882.8	.35	.016	2.02 *	1.68	2.85				DO,PV,I-I/III,B	16	5
AF-65	2883.15	.15	.022	80.3 F*	61.3 F*	2.84				DO,PV,I/III,B	16	5
AF-66	2883.3	.4	.051	190 F	96.3 F*	2.84				DO,PV,I,A	16	5
AF-67	2883.7	.27	.032	98.8 F*	64.7 F	2.84				DO,I,C	16	5
1-6688	2883.97	.33	.031	62.6 F	no test	2.84				DO,I,C	16	1
AF-68	2884.3	.18	.04	30.7 F	23.4 F*	2.84				DO,I,C	16	5
AF-69	2884.48	.34	.023	1.59	1.22 *	2.84				DO,I,C	16	5
AF-70	2884.82	.38	.041	8.81F	4.78F*	2.84				DO,I,C	16	5
AF-71	2885.2	.22	.026	.95F	.85F*	2.82				DO,PB,I,A	16	5
AF-72	2885.42	.34	.022	1.28	.95 *	2.86				DO,I,B	16	5
1-6689	2885.76	.24	.097	25.7 F	no test	2.82				DO,I,B	16	1
AF-73	2886	.58	.042	30.2 F*	19.1 F*	2.83				DO,PV,I,C	16	5
AF-74	2886.58	.24	.04	23.8 F*	19.4 F	2.84				DO,I,B	17	5
AF-75	2886.82	.33	.048	29.7 F*	20.1 F	2.82				DO,PB,I,C	17	5
AF-76	2887.15	.35	.051	25.6 F*	17 F	2.83				DO,I,B	18	5
1-6690	2887.5	.2	.029	4.3 F	no test	2.78				DO,I,A	18	1
1-6691	2887.7	.1	.019	1.62	no test	2.84				DO,I,A	19	1

END CORE #4

CORE ANALYSIS REPORT

WELL: SHELL ARROWHEAD B-41
UWI: 300B4160401224500
FIELD: ARROWHEAD
FORMATION: (MANETOE - Dmnt)

DATE: 890302
WELL CODE: AF89
K. B: 520.00

SAMPLE NO	INT TOP (m)	INT THCK (m)	PORO (VF)	K-MAX (mD)	K-90 (mD)	GRN DENS (sg)	OIL SAT (VF)	H2O SAT (VF)	F L R	LITHOLOGY	T V OR P

(1) similar numbers indicate continuous orientation

F	fractured	V	yes	N	no	FR	friable
U	unconsol.	SS	sandstone	LS	limestone	DO	dolomite
AN	anhydrite	SL	siltstone	SH	shale	CO	conglomerate
CC	calcite	CL	clean	CA	calcareous	CH	cherty
SI	siliceous	STY	silty	SHY	shaly	PY	pyritic
GL	glauconite	ST	stylolite	PB	pyrobitumen		
L	large	M	medium	F	fine	VF	very fine
N	none	P	poor	G	good	E	excellent

roman numerals and letters are Archie classification
* indicates direction of orientation lines.
*** indicates permeability greater than 1000md.

SHELL CANADA LIMITED CALGARY RESEARCH CENTER
CORE SERVICES SECTION

24-MAY-1989
PAGE 1

HEIGHT TIMES POROSITY & PERMEABILITY REPORT

WELL: SHELL ARROWHEAD C-41
UWI: 300B416040122450O
FIELD: ARROWHEAD
FORMATION: (MANETOE - Dmnt)

DATE: 890302
WELL CODE: AF89
K. B: 520.00

SAMPLE NO	INT TOP (m)	INT THCK (m)	PORO (VF)	H*PORO	K-MAX (mD)	H*K-MAX	K-90 (mD)	H*K-90	TYP
AF-1	2855	.5	.013	.006	88.4	44.2	.17	.08	5
AF-2	2855.5	.5	.007	.003	79	39.5	65	32.5	5
AF-3	2856	.75	.008	.006	62.3	46.7	28.8	21.6	5
AF-4	2856.75	.25	0	0	50	12.5	42.1	10.5	5
AF-5	2857	.4	.002	.001	1.64	.66	1.05	.42	5
AF-6	2857.4	.4	.001	0	5.19	2.08	.63	.25	5
AF-7	2857.8	.5	.009	.004	5.83	2.91	4.02	2.01	5
AF-8	2858.3	.7	.017	.012	389	273	118	82.4	5
AF-9	2859	.5	.038	.019	.51	.26	.4	.2	5
AF-10	2859.5	.25	.001	0	.08	.02	.03	.01	5
AF-11	2859.75	.35	.006	.002	.03	.01	.02	.01	5
AF-12	2860.1	.15	.017	.003	57.8	8.67	34.1	5.12	5
AF-13	2860.25	.25	.032	.008	244	60.9	39.8	9.96	5
AF-14	2860.5	.4	.017	.007	9.68	3.87	5.33	2.13	5
AF-15	2860.9	.1	.019	.002	47.8	4.78	17.5	1.75	5
AF-16	2861	.25	.024	.006	132	33	123	30.7	5
AF-17	2861.25	.25	.021	.005	8.46	2.11	6.57	1.64	5
AF-18	2861.5	.25	.022	.006	24.1	6.02	18	4.5	5
AF-19	2861.75	.5	.021	.01	114	57	76.3	38.1	5
AF-20	2862.25	.5	.029	.015	4.04	2.02	1.38	.69	5
AF-21	2862.75	.35	.023	.008	34.3	12	14.5	5.09	5
AF-22	2863.1	.4	.021	.008	10.6	4.24	9.85	3.94	5
AF-23	2863.5	.25	.055	.014	2.02	.51	1.88	.47	5
AF-24	2863.75	.25	.084	.021	53.1	13.3	1.46	.36	5
AF-25	2864	.35	.026	.009	4.41	1.54	.73	.25	5
AF-26	2864.35	.4	.037	.015	16.7	6.7	11.4	4.58	5
AF-27	2864.75	.25	.019	.005	17.4	4.34	13.7	3.42	5
AF-28	2865	.5	.02	.01	24.5	12.3	20	10	5
AF-29	2865.5	.25	.055	.014	1860	465	875	219	5
AF-30	2865.75	.25	.018	.004	10.4	2.61	3.61	.9	5
AF-31	2866	.25	.013	.003	.65	.16	.54	.13	5
AF-32	2866.25	.3	.024	.007	83.8	25.2	31.6	9.49	5
AF-33	2866.55	.7	.015	.011	2.15	1.5	1.86	1.3	5
AF-34	2867.25	.35	.016	.005	10.1	3.52	6.06	2.12	5
AF-35	2867.6	.4	.011	.004	133	53.1	81.3	32.5	5
1-6569	2868	1.15	.031	.036	33.3	38.3	no test	11500	1
1-6678	2869.8	.6	.027	.016	209	125	no test	6000	1
AF-36	2870.4	.4	.015	.006	40.3	16.1	14.1	5.62	5
AF-37	2870.8	.48	.038	.018	19.5	9.36	7.95	3.82	5
1-6679	2871.28	.24	.04	.01	12	2.87	no test	2400	1
1-6680	2871.52	.44	.02	.009	.26	.12	no test	4400	1
AF-38	2871.96	.31	.027	.009	85.2	26.4	35.1	10.9	5
AF-39	2872.27	.28	.015	.004	729	204	1.44	.4	5
AF-40	2872.55	.2	.02	.004	16.2	3.25	6.4	1.28	5
AF-41	2872.75	.26	.025	.006	1780	463	363	94.4	5
1-6681	2873.01	.51	.022	.011	.81	.41	no test	5100	1
AF-42	2873.52	.38	.056	.021	2000	760	3.6	1.37	5
AF-43	2873.9	.43	.023	.01	39.2	16.8	31.4	13.5	5
1-6682	2874.33	.1	.022	.002	.11	.01	no test	1000	1
AF-44	2874.43	.27	.015	.004	20.6	5.57	9.15	2.47	5

HEIGHT TIMES POROSITY & PERMEABILITY REPORT

WELL: SHELL ARROWHEAD B-41
UWI: 300B41604012245OO
FIELD: ARROWHEAD
FORMATION: (MANETOE - Dmnt)

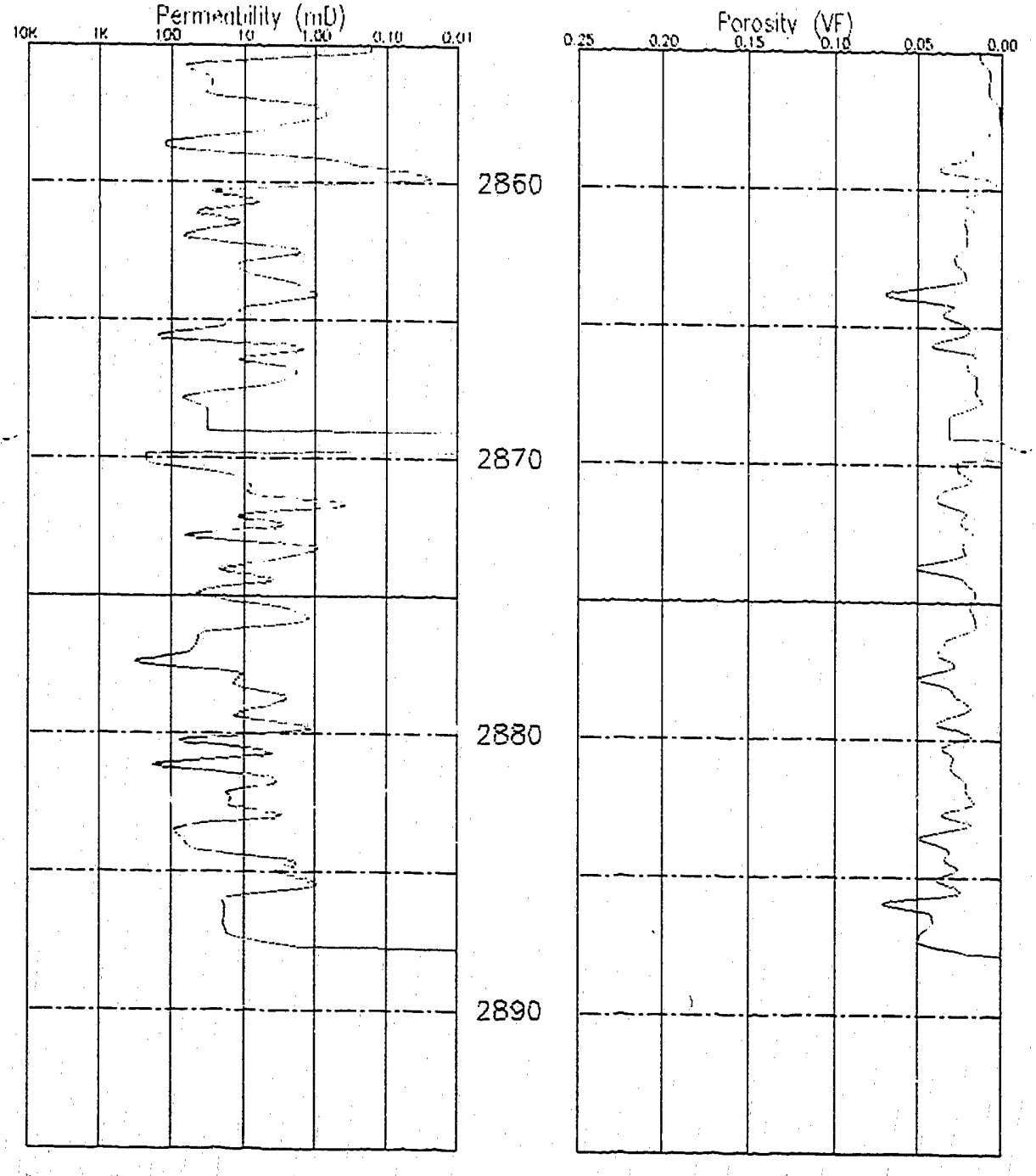
DATE: 890302
WELL CODE: AF89
K. B: 520.00

SAMPLE NO	INT TOP (m)	INT THCK (m)	PORO (VF)	H*PORO	K-MAX (mD)	H*K-MAX	K-90 (mD)	H*K-90	TYP
AF-45	2874.7	.3	.016	.005	83.5	25	40.2	12.1	5
AF-46	2875	.21	.02	.004	73	15.3	58	12.2	5
AF-47	2875.21	.36	.017	.006	4.93	1.77	3.23	1.16	5
AF-48	2875.57	.58	.015	.009	1.25	.72	1.17	.68	5
AF-49	2876.15	.57	.034	.019	109	62.2	43.4	24.8	5
1-6683	2876.72	.3	.041	.012	48.4	14.5	no test	3000	1
AF-50	2877.02	.28	.027	.007	428	120	64.5	18.1	5
AF-51	2877.3	.3	.03	.009	1590	477	715	215	5
AF-52	2877.6	.28	.059	.016	2000	560	7.81	2.19	5
AF-53	2877.88	.62	.03	.019	17.6	10.9	14	8.66	5
AF-54	2878.5	.17	.021	.004	5.75	.98	1.28	.22	5
AF-55	2878.67	.43	.018	.008	3.87	1.66	3.39	1.46	5
AF-56	2879.1	.52	.039	.02	407	212	14.5	7.53	5
AF-57	2879.62	.42	.015	.006	.91	.38	.73	.31	5
1-6684	2880.04	.16	.044	.007	102	16.2	no test	1600	1
AF-58	2880.2	.3	.034	.01	176	52.7	104	31.3	5
AF-59	2880.5	.25	.026	.007	4.67	1.17	1.85	.46	5
1-6685	2880.75	.25	.033	.008	8.39	2.1	no test	2500	1
AF-60	2881	.32	.029	.009	499	160	468	150	5
AF-61	2881.32	.43	.021	.009	19	8.15	6.29	2.7	5
1-6686	2881.75	.12	.026	.003	.47	.06	no test	1200	1
AF-62	2881.87	.43	.018	.008	19.3	8.31	19.3	8.3	5
1-6687	2882.3	.22	.013	.003	12.8	2.81	no test	2200	1
AF-63	2882.52	.28	.046	.013	25.7	7.2	22	6.16	5
AF-64	2882.8	.35	.016	.006	2.02	.71	1.68	.59	5
AF-65	2883.15	.15	.022	.003	80.3	12	61.3	9.2	5
AF-66	2883.3	.4	.051	.021	190	76	96.3	38.5	5
AF-67	2883.7	.27	.032	.009	98.8	26.7	64.7	17.5	5
1-6688	2883.97	.33	.031	.01	62.6	20.6	no test	3300	1
AF-68	2884.3	.18	.04	.007	30.7	5.53	23.4	4.22	5
AF-69	2884.48	.34	.023	.008	1.59	.54	1.22	.41	5
AF-70	2884.82	.38	.041	.016	8.81	3.35	4.78	1.81	5
AF-71	2885.2	.22	.026	.006	.95	.21	.85	.19	5
AF-72	2885.42	.34	.022	.008	1.28	.44	.95	.32	5
1-6689	2885.76	.24	.097	.023	25.7	6.18	no test	2400	1
AF-73	2886	.58	.042	024	30.2	17.5	19.1	11.1	5
AF-74	2886.58	.24	.04	.01	23.8	5.72	19.4	4.66	5
AF-75	2886.82	.33	.048	.016	29.7	9.8	20.1	6.63	5
AF-76	2887.15	.35	.051	.018	25.6	8.95	17	5.96	5
1-6690	2887.5	.2	.029	.006	4.3	.86	no test	2000	1
1-6691	2887.7	.1	.019	.002	1.62	.16	no test	1000	1

SHELL CANADA LIMITED
CALGARY RESEARCH CENTRE
ROUTINE CORE SMOOTHED DEPTH PLOT

Well Name: SHELL ARROWHEAD B-41
UWI: 300B416040122450O
Formation: MANETOE - Dmnt

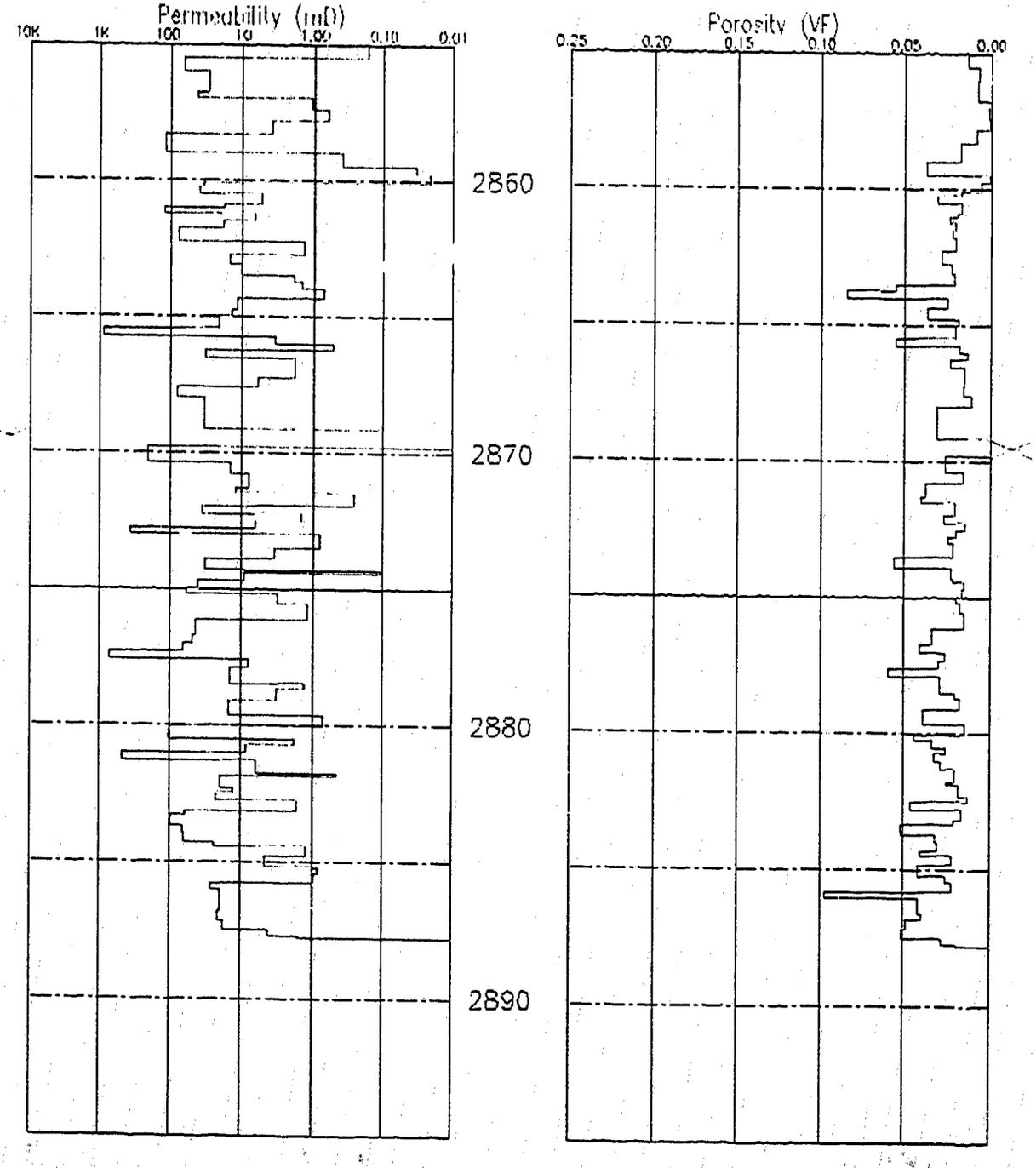
Date: 890302
Well Code: AF89
Field: ARROWHEAD



SHELL CANADA LIMITED
CALGARY RESEARCH CENTRE
ROUTINE CORE UNSMOOTHED DEPTH PLOT

Well Name: SHELL ARROWHEAD B-41
UWI: 300B416040122450O
Formation: MANETOL - Dmnt

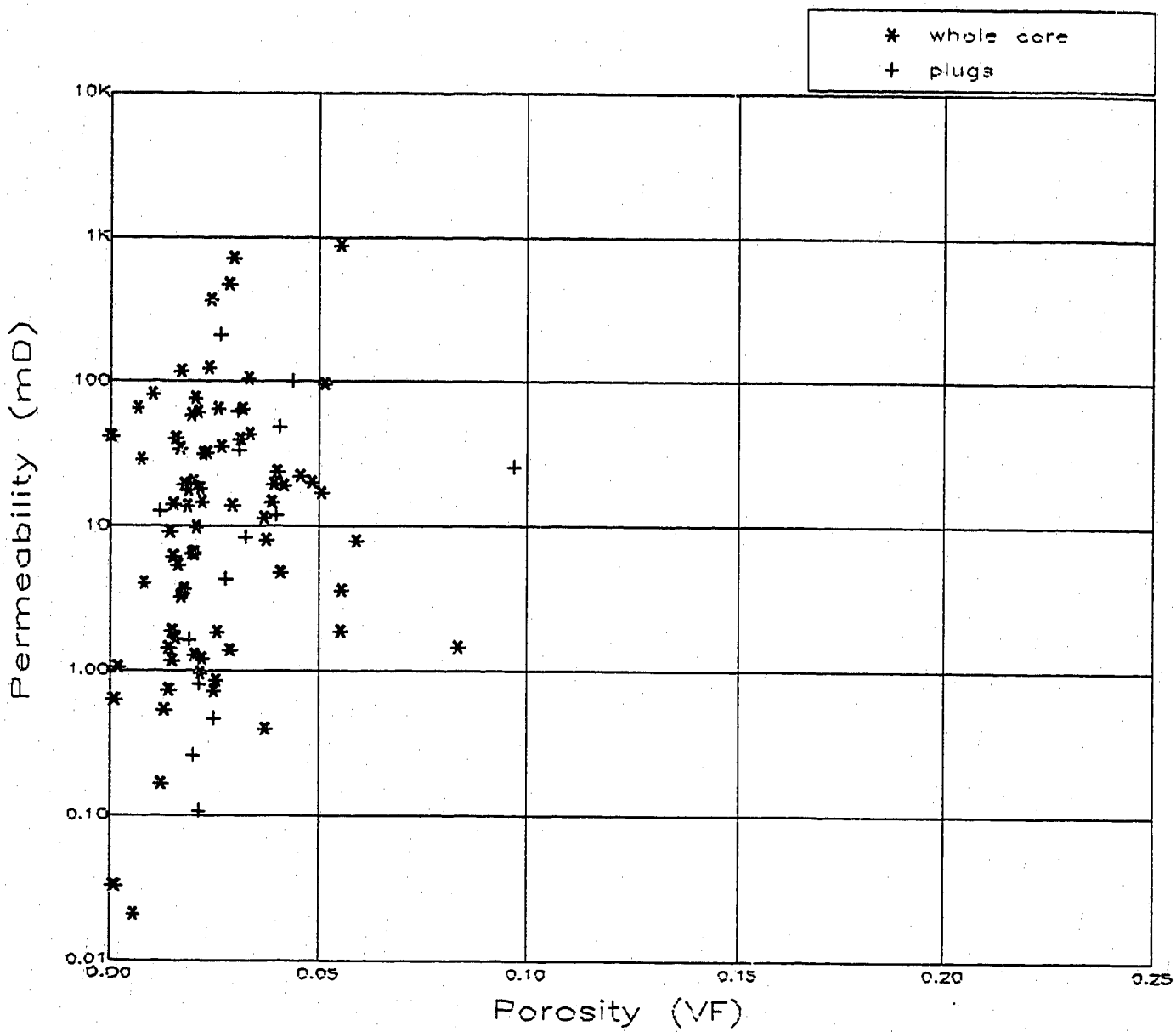
Date: 890302
Well Code: AF89
Field: ARROWHEAD



SHELL CANADA LIMITED
CALGARY RESEARCH CENTRE
ROUTINE CORE SCATTER PLOT

Well Name: SHELL ARROWHEAD B-41
UWI: 300B416040122450O
Formation: MANETOE - Dmnt

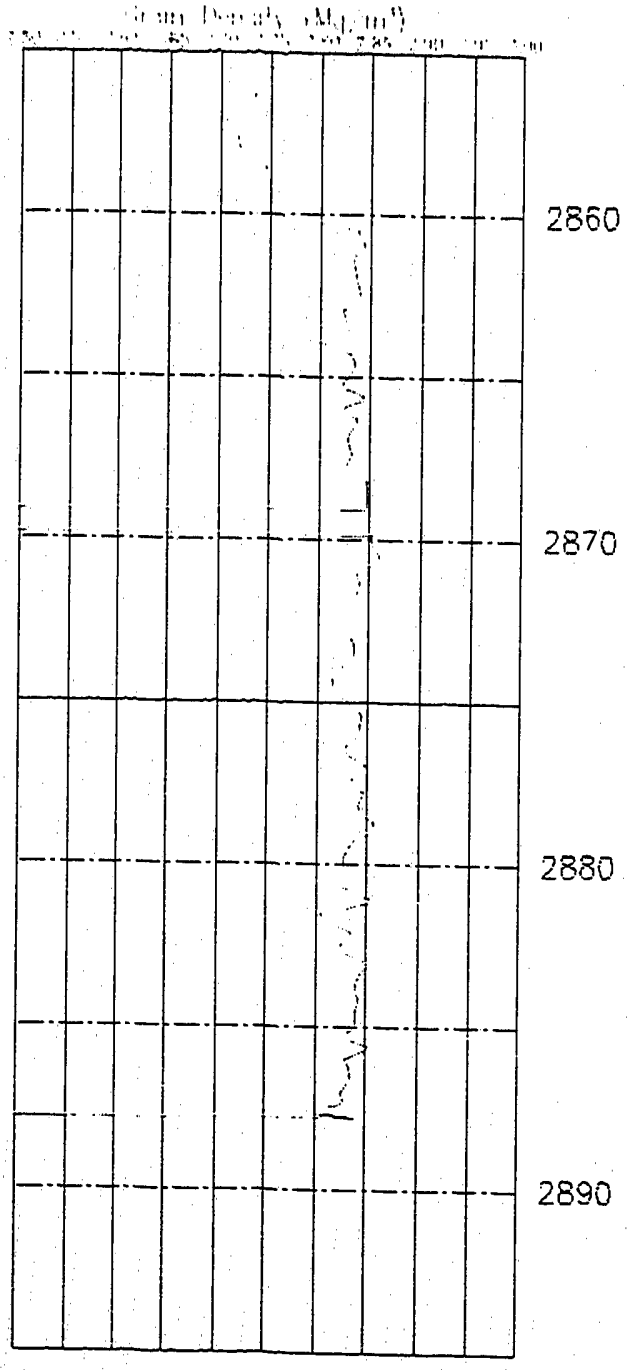
Date: 890302
Well Code: AF89
Field: ARROWHEAD



SHELL CANADA LIMITED
CALGARY RESEARCH CENTRE
ROUTINE CORE SMOOTHED DEPTH PLOT

Well Name: SHELL ARROWHEAD B-41
UWI: 300B416040122450O
Formation: MANETOE - Dmnt

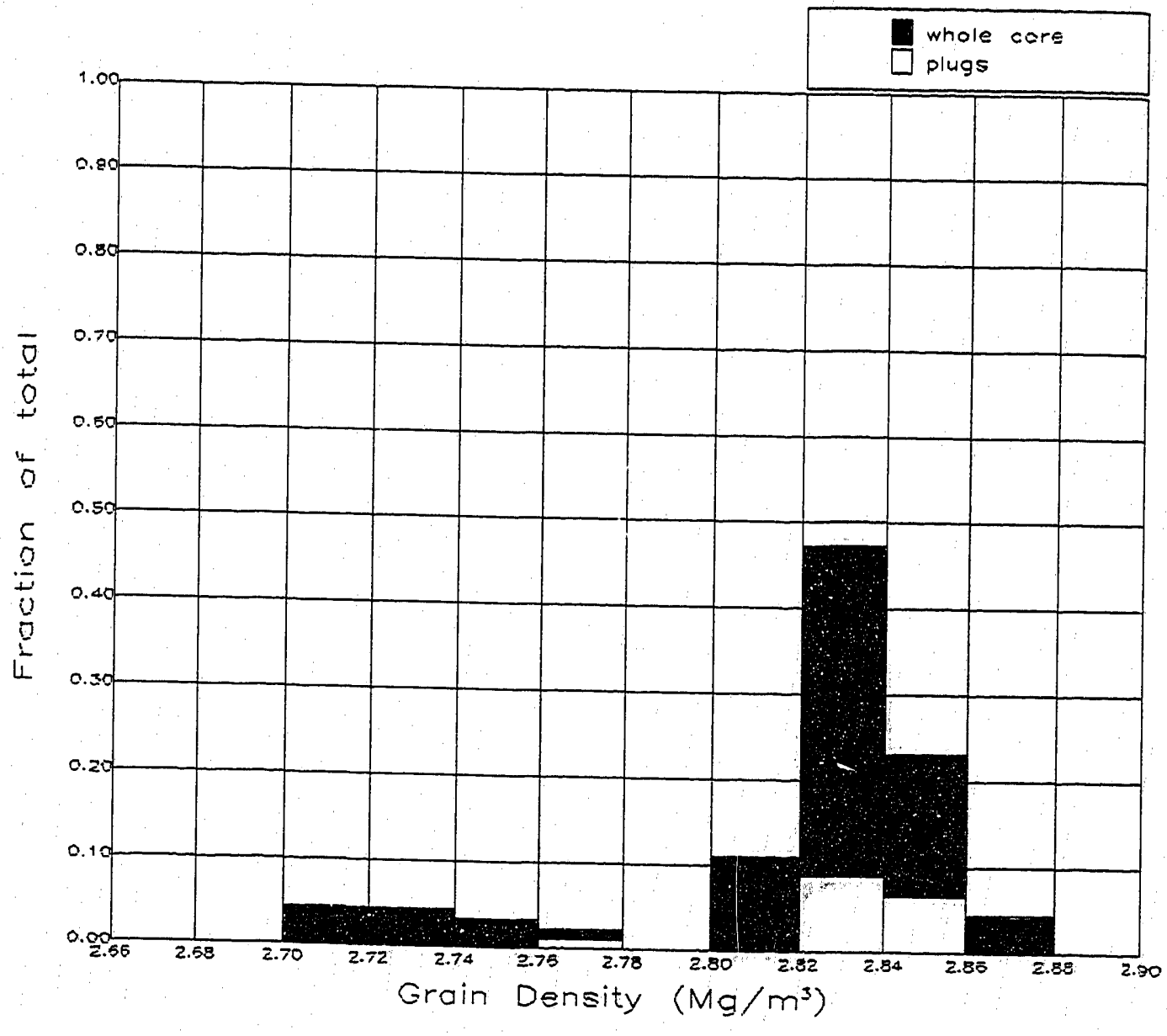
Date: 890302
Well Code: AF89
Field: ARROWHEAD



SHELL CANADA LIMITED
CALGARY RESEARCH CENTRE
ROUTINE CORE HISTOGRAM

Well Name: SHELL ARROWHEAD B-41
UWI: 300B416040122450O
Formation: MANETOE - Dmnt

Date: 890302
Well Code: AF89
Field: ARROWHEAD



DST #1

9011-S4-3-1

Schlumberger | Schlumberger of Canada Testing Services

OTTAWA COPY

Test Date : 2/6/89
Location : 60-30 N 122-53 W
DST # : ONE

LEVEL I FLOPETROL JOHNSTON ™ DST REPORT

for

SHELL CANADA LTD.

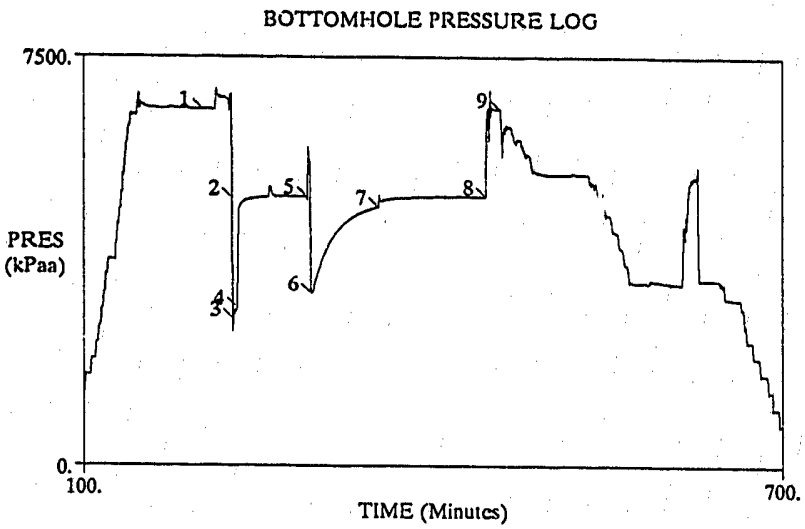
Well: SHELL ET AL ARROWHEAD B-41

DST #ONE: BASAL QUARTZ FORMATION - (633 - 641M)

**********Test Reference Number: 300277A**********

Test Data

#	Explanation	P(kPa)	T(min)
1	HYDROSTATIC	6541.0	200.0
2	REFERENCE TIME	4910.9	225.0
3	START FLOW	2691.4	226.0
4	START SHUT-IN	2894.4	229.5
5	END SHUT-IN	4950.5	289.0
6	START FLOW	3167.2	293.0
7	START SHUT-IN	4757.2	351.5
8	END SHUT-IN	4952.6	445.0
9	HYDROSTATIC	6553.9	457.0



Test Results [CONVENTIONAL STRADDLE]

FINAL SHUTIN PRESSURE	4952.6 kPa
RESERVOIR TEMPERATURE	33.3 C
PRODUCTION RATE	TOO SMALL TO MEASURE
NET PIPE RECOVERY	400 m OF SLIGHTLY GAS CUT DRILLING MUD AND SALT WATER-8000ppm REVERSED OUT

Blow Description

PREFLOW	STRONG AIR BLOW IN 30 SECS AND THROUGHOUT N.G.T.S.
MAINFLOW	FAIR AIR BLOW G.T.S. 10 MINS LAZY .50 m FLAME SLOWLY DECREASING

Comments

THIS WAS A MECHANICALLY SUCCESSFUL TEST OF THE BASAL QUARTZ FORMATION FROM 633 TO 641 METERS. DURING THE TEST GAS DID FLOW TO SURFACE, HOWEVER AT RATES TOO SMALL TO MEASURE. THE SALINITIES OF THE RECOVERED FLUID INDICATE THAT SALT WATER WAS PRODUCED WITH THE DRILLING MUD AND FILTRATE.

THE BOTTOMHOLE PRESSURE RESPONSE INDICATES A ZONE OF GOOD PERMEABILITY WITH NO SKIN DAMAGE AT THE TIME OF THE TEST.

SHOULD YOU REQUIRE ADDITIONAL INFORMATION, PLEASE CONTACT MARCUS GREEN AT 231-9707

Schlumberger

Schlumberger of Canada
Testing Services

Test Date : 2/6/89
Location : 60-30 N 122-53 W
DST # : ONE

Flowrate Summary and Sequence of Events

LABEL POINT #	TIME of DAY (HH:MM:SS)	EXPLANATION	DURATION (min)	BHP kPaa	BHT C	SURF PRESS kPaa	FLOW RATE (M cube/Day)
1	13:09:00	HYDROSTATIC		6541.0	32.9		
2	13:34:00	REFERENCE TIME	25.0	4910.9	33.0		
3	13:35:00	START FLOW	1.0	2691.4	33.0		
4	13:38:30	START SHUT-IN	3.5	2894.4	32.9		
5	14:38:00	END SHUT-IN	59.5	4950.5	32.0		
6	14:42:00	START FLOW	4.0	3167.2	32.0		
7	15:40:30	START SHUT-IN	58.5	4757.2	30.3		
8	17:14:00	END SHUT-IN	93.5	4952.6	31.0		
9	17:26:00	HYDROSTATIC	12.0	6553.9	31.0		

Sample Data

Sample #/Source	Description	RESISTIVITY ohm @ C	Salinity PPM(NaCl)
1-MUD TANKS	GEL CHEM DRILLING MUD FILTRATE WATER	2.59 @ 16 2.62 @ 17	2400 2300
2-FLUID RECOVERY	SALT WATER	0.92 @ 13	8000
3-			
4-			
5-			

Samples Sent To: CHEMEX LABS- GRANDE PRAIRIE

Schlumberger
Schlumberger of Canada
Testing Services

Test Date : 2/6/89
Location : 60-30 N 122-53 W
DST # : ONE

Hole Conditions

Total Depth(MD/TVD)	667 m
Hole Size	216 mm
Mud Weight	1090 kg/m3
Mud Type	GEL CHEM

Test String Configuration

Pipe Length/I.D.	447.74 m / 108 mm
Collar Length/I.D.	171.52 m / 73 mm
Packer Depths	633 - 641 m
Bottomhole Choke Size	19.05 mm
Gauge Depth/Type	623.57 m / J300

Tool Sequence:

#	DESCRIPTION	LENGTH(m)	DEPTH(m)
0	DRILL PIPE TOP	0.00	-6.22
1	Drill Pipe	9.70	3.48
2	OTHER STABBING VALVE	0.45	3.93
3	Drill Pipe	438.04	441.97
4	Drill Collars	143.00	584.97
5	Pumpout Sub PIN TYPE	0.31	585.28
6	Drill Collars	8.90	594.18
7	Pumpout Sub PRESSURE TYPE	0.74	594.92
8	Drill Collars	19.55	614.47
9	OTHER BIT SUB	0.87	615.34
10	Crossover	0.30	615.64
11	Recorder AK1 #2087	1.34	616.98
12	MFE [Test Valve] #131870/#105611'	3.84	620.82
13	Bypass	0.91	621.73
14	Recorder AK1 #2062	1.34	623.07
15	Elec.Recorder J300 #2062	2.36	625.43
16	Jars	2.36	627.79
17	OTHER HANGER SUB	0.25	628.04
18	Safety Joint	0.55	628.59
19	Safety Seal Packer	2.82	631.41
20	REFERENCE PACKER 196mm	1.59	633.00
21	Packer Stub	0.33	633.33
22	OTHER FLOW PORTS	1.52	634.85
23	Receiver Sub	0.25	635.10
24	Crossover	0.24	635.34
25	Recorder K3 #17729/#17730	1.84	637.18
26	Blank Anchor	2.74	639.92
27	Packer Stub	1.10	641.02
28	Packer 196mm	0.82	641.84
29	Packer 196mm	1.92	643.76
30	Recorder AK1 #2107	1.34	645.10
31	OTHER FLOW PORTS	1.82	646.92
32	Crossover	0.28	647.20
33	Drill Pipe	18.98	666.18
34	Crossover	0.22	666.40
35	Bullnose	0.63	667.03

Flopetrol Representative : B. HOLLINGSHEAD

District : GRANDE PRAIRIE

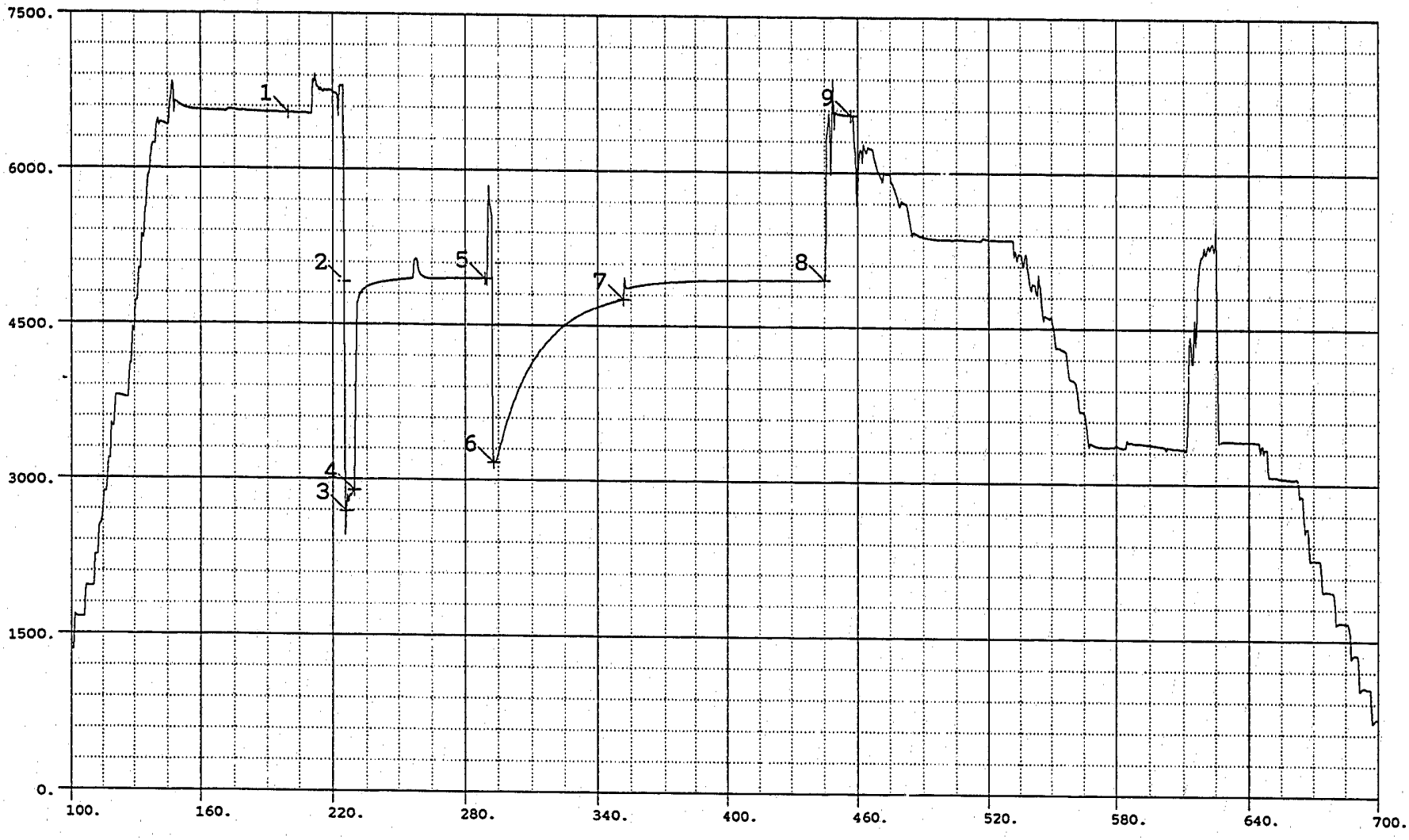
Schlumberger of Canada
Schlumberger Testing Services

BOTTOMHOLE PRESSURE PLOT

FIELD REPORT NO. : 300277A
INSTRUMENT NO. : J300-2062
DEPTH : 623.57 m
CAPACITY : 68950 kPa / 150 C
PORT OPENING : INSIDE

COMPANY : SHELL CANADA LTD.
WELL : SHELL ET AL ARROWHEAD B-41
DST# : ONE

Y-AXIS



X-AXIS

X-AXIS = ELAPSED TIME [MIN]
Y-AXIS = BOTTOMHOLE PRESSURE [KPA (ABS)]

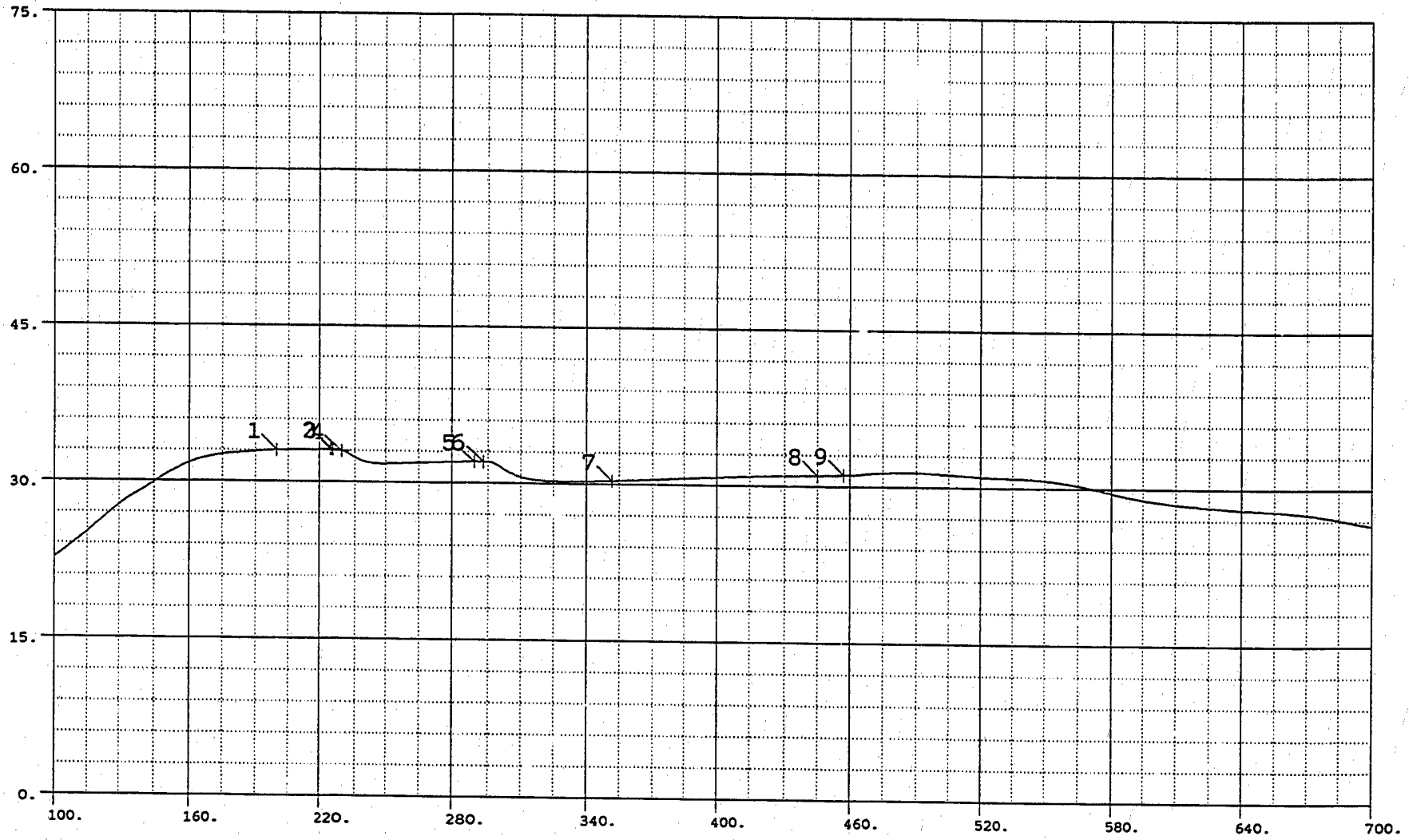
Schlumberger of Canada
Schlumberger Testing Services

BOTTOMHOLE TEMPERATURE PLOT

FIELD REPORT NO. : 300277A
INSTRUMENT NO. : J300-2062
DEPTH : 623.57 m
CAPACITY : 68950 kPa / 150 C
PORT OPENING : INSIDE

COMPANY : SHELL CANADA LTD.
WELL : SHELL ET AL ARROWHEAD B-41
DST# : ONE

Y-AXIS



X-AXIS

X-AXIS = ELAPSED TIME [MIN]
Y-AXIS = BOTTOMHOLE TEMPERATURE [CEL]

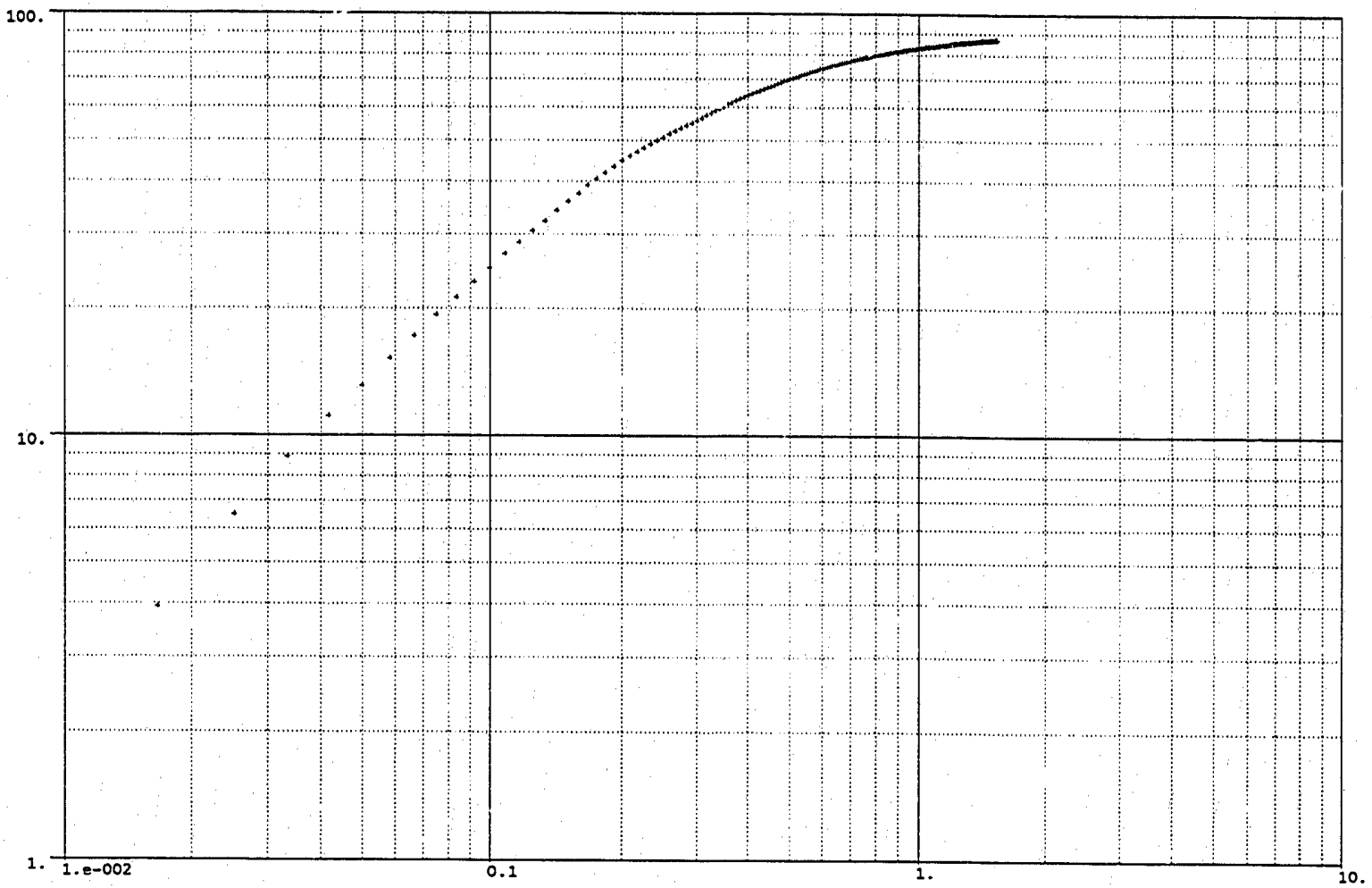
Schlumberger of Canada
Schlumberger Testing Services

L O G - L O G P L O T

FIELD REPORT#: 300277A
INSTRUMENT#: J300-2062
ELAPSED TIME RANGE: 353. - 445. MIN.
Delta_T TIME RANGE: 8.3e-003 - 1.533333 HR.

COMPANY: SHELL CANADA LTD.
WELL: SHELL ET AL ARROWHEAD B-41
SHUTIN#: TWO
DST#: ONE

Y-AXIS



X-AXIS

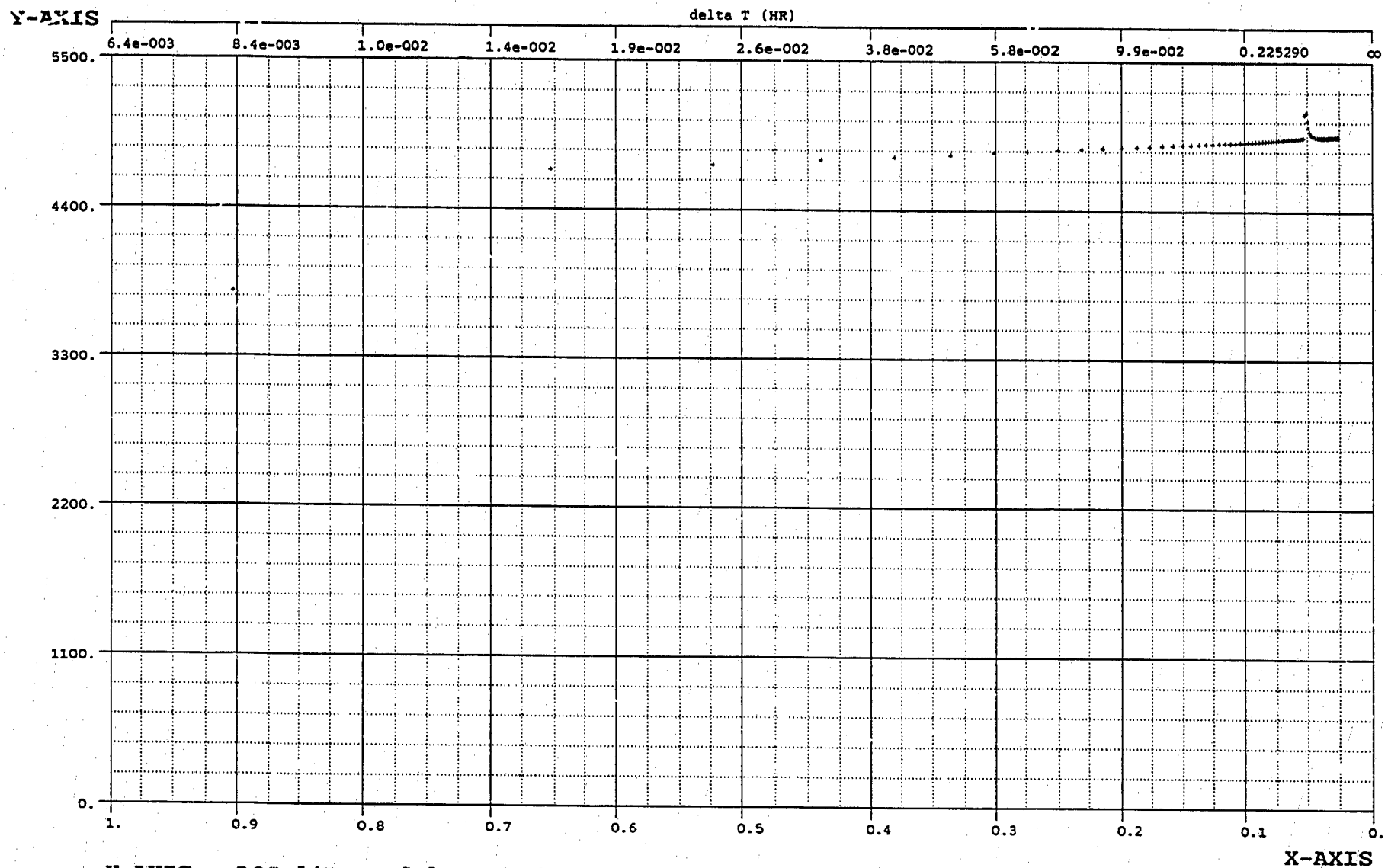
X-AXIS = delta T (HR)
Y-AXIS = delta P (KPA)

Schlumberger of Canada
Schlumberger Testing Services

HORNER PLOT

FIELD REPORT#: 300277A
INSTRUMENT#: J300-2062
ELAPSED TIME RANGE: 229.5 - 289. MIN.
Delta_T TIME RANGE: 8.3e-003 - 0.991666 HR.
PRODUCING TIME [Tp]: 5.8e-002 HR.

COMPANY: SHELL CANADA LTD.
WELL: SHELL ET AL ARROWHEAD B-41
SHUTIN#: ONE
DST#: ONE



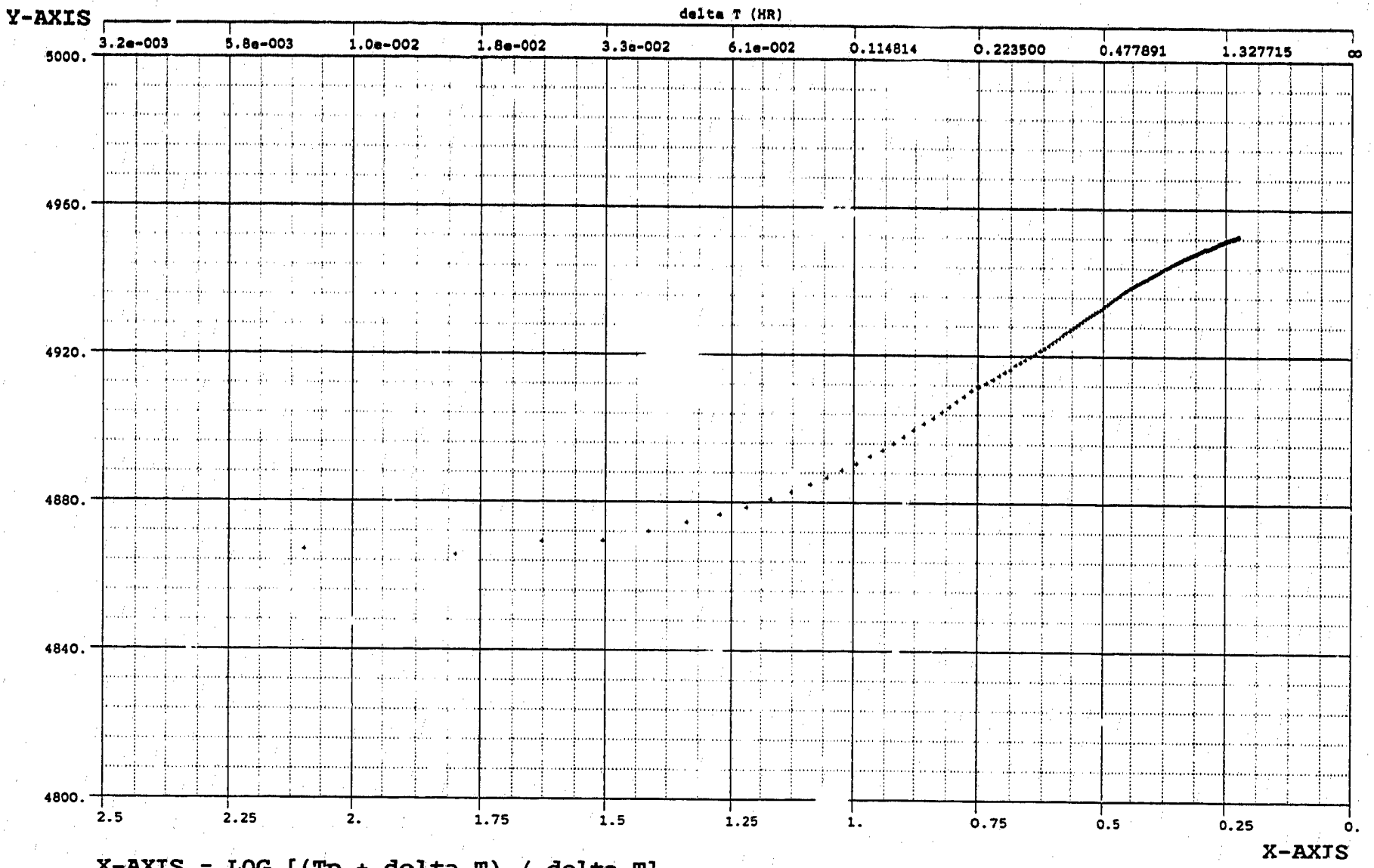
X-AXIS = LOG [(Tp + delta T) / delta T]
Y-AXIS = SHUTIN PRESSURE [KPA (ABS)]

Schlumberger of Canada
Testing Services

HORNER PLOT

FIELD REPORT#: 300277A
INSTRUMENT#: J300-2062
ELAPSED TIME RANGE: 352. - 445. MIN.
Delta_T TIME RANGE: 8.3e-003 - 1.55 HR.
PRODUCING TIME [Tp]: 1.033333333 HR.

COMPANY: SHELL CANADA LTD.
WELL: SHELL ET AL ARROWHEAD B-41
SHUTIN#: TWO
DST#: ONE



X-AXIS = LOG [(Tp + delta T) / delta T]
Y-AXIS = SHUTIN PRESSURE [KPA (ABS)]

WELL: SHELL ET AL ARROWHEAD B-41 DST#: ONE INTERVAL: 633 - 641
TEST REFERENCE#: 300277A FILE STARTS: 9:49:30 on February 6, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T
0.5	106.04	57.42
1.0	79.28	57.31
1.5	65.63	57.14
2.0	57.84	56.91
2.5	53.91	56.68
3.0	51.22	56.43
3.5	49.57	56.15
4.0	48.67	55.88
4.5	47.98	55.60
5.0	47.91	55.31
5.5	47.84	55.04
6.0	47.91	54.74
6.5	48.19	54.48
7.0	48.40	54.21
7.5	48.81	53.94
8.0	49.22	53.67
8.5	49.57	53.41
9.0	49.98	53.14
9.5	50.40	52.90
10.0	50.81	52.64
10.5	51.15	52.40
11.0	51.50	52.16
11.5	51.77	51.94
12.0	51.98	51.71
12.5	52.19	51.47
13.0	52.33	51.25
13.5	52.53	51.04
14.0	52.67	50.83
14.5	52.88	50.61
15.0	52.88	50.40
15.5	53.08	50.19
16.0	53.02	49.98
16.5	53.02	49.77
17.0	53.02	49.56
17.5	53.02	49.37
18.0	52.95	49.16
18.5	53.02	48.95
19.0	53.08	48.77
19.5	53.02	48.56
20.0	52.95	48.37
20.5	52.95	48.17
21.0	52.74	47.98
21.5	52.74	47.78
22.0	52.60	47.60
22.5	52.60	47.41
23.0	52.53	47.21
23.5	52.26	47.03
24.0	52.12	46.83
24.5	52.05	46.64
25.0	51.91	46.46
25.5	51.98	46.26
26.0	52.05	46.08
26.5	51.98	45.88
27.0	51.84	45.70
27.5	51.91	45.53
28.0	51.91	45.33
28.5	51.77	45.15
29.0	51.77	44.95
29.5	51.77	44.78
30.0	51.71	44.60
30.5	51.64	44.41
31.0	51.57	44.23
31.5	51.43	44.06
32.0	51.36	43.86
32.5	51.36	43.69
33.0	51.36	43.50
33.5	51.22	43.32
34.0	51.22	43.15
34.5	51.15	42.96
35.0	51.15	42.79
35.5	51.08	42.62
36.0	51.02	42.45
36.5	50.95	42.26
37.0	50.88	42.09
37.5	50.88	41.92
38.0	50.74	41.75
38.5	50.74	41.58
39.0	50.67	41.40
39.5	50.46	41.23
40.0	50.46	41.06
40.5	50.40	40.89
41.0	50.33	40.73
41.5	50.19	40.56
42.0	50.33	40.40
42.5	50.53	40.23
43.0	50.46	40.07
43.5	50.33	39.90
44.0	50.26	39.74
44.5	50.12	39.57
45.0	49.98	39.41
45.5	49.91	39.25
46.0	54.81	39.09
46.5	57.22	38.92
47.0	62.53	38.76
47.5	62.53	38.60
48.0	65.15	38.44
48.5	65.77	38.28
49.0	69.15	38.12
49.5	69.42	37.96
50.0	69.22	37.80
50.5	69.08	37.64
51.0	68.74	37.48
51.5	68.53	37.33
52.0	68.18	37.17
52.5	67.91	37.01
53.0	67.77	36.85
53.5	66.87	36.70
54.0	64.87	36.51
54.5	61.50	36.32
55.0	57.63	36.09
55.5	60.46	35.83
56.0	59.57	35.54
56.5	59.01	35.22
57.0	55.01	34.86
57.5	51.71	34.48
58.0	49.22	34.09
58.5	47.36	33.69
59.0	46.05	33.26
59.5	45.22	32.83
60.0	44.95	32.39
60.5	45.09	31.94
61.0	45.50	31.52
61.5	46.33	31.10
62.0	47.29	30.69
62.5	48.53	30.28
63.0	49.77	29.87
63.5	51.36	29.50
64.0	52.95	29.13
64.5	54.53	28.77
65.0	56.12	28.42
65.5	57.70	28.10
66.0	59.29	27.78
66.5	60.88	27.48
67.0	62.39	27.18
67.5	63.77	26.91
68.0	65.22	26.65
68.5	66.60	26.39
69.0	67.98	26.16
69.5	69.22	25.94
70.0	70.60	25.72
70.5	71.70	25.50
71.0	72.87	25.31
71.5	73.91	25.12
72.0	74.94	24.95
72.5	75.97	24.79
73.0	76.94	24.63
73.5	77.84	24.48
74.0	78.80	24.33
74.5	79.56	24.21
75.0	80.11	24.06
75.5	80.80	23.95
76.0	81.42	23.82
76.5	81.97	23.71
77.0	82.53	23.61
77.5	83.15	23.51
78.0	249.72	23.40
78.5	325.29	23.31
79.0	325.22	23.23
79.5	324.94	23.15
80.0	323.91	23.06
80.5	322.94	22.97
81.0	322.18	22.90
81.5	321.84	22.81
82.0	331.91	22.73
82.5	330.94	22.66
83.0	330.80	22.59
83.5	330.80	22.52
84.0	434.84	22.44
84.5	435.81	22.38
85.0	435.46	22.33
85.5	435.53	22.26
86.0	435.67	22.22
86.5	435.67	22.16
87.0	438.43	22.12
87.5	681.19	22.09
88.0	742.69	22.07
88.5	740.90	22.04
89.0	740.97	22.01
89.5	740.42	22.00
90.0	753.31	21.98
90.5	1045.30	21.98
91.0	1045.85	21.98
91.5	1044.27	21.98
92.0	1045.30	22.00
92.5	1046.96	22.00
93.0	1172.44	22.02
93.5	1355.36	22.04
94.0	1351.56	22.07
94.5	1349.70	22.09
95.0	1348.60	22.13
95.5	1347.50	22.16
96.0	1346.25	22.20
96.5	1345.22	22.24
97.0	1345.01	22.30
97.5	1344.74	22.34
98.0	1344.60	22.40
98.5	1345.08	22.45
99.0	1345.01	22.51
99.5	1345.50	22.58
100.0	1345.36	22.63
100.5	1349.36	22.70
101.0	1339.43	22.77
101.5	1687.40	22.84
102.0	1665.69	22.92
102.5	1663.13	22.99
103.0	1661.62	23.06
103.5	1660.86	23.15
104.0	1660.86	23.22
104.5	1660.38	23.30
105.0	1658.38	23.39
105.5	1658.58	23.47
106.0	1662.03	23.55
106.5	1903.83	23.62
107.0	1964.92	23.71
107.5	1959.95	23.79
108.0	1956.99	23.88
108.5	1955.68	23.96
109.0	1954.44	24.05
109.5	1956.16	24.13
110.0	1957.06	24.22
110.5	1958.57	24.30
111.0	2254.22	24.39
111.5	2260.15	24.48
112.0	2259.11	24.56
112.5	2257.94	24.65
113.0	2516.97	24.73
113.5	2560.48	24.82
114.0	2559.86	24.91
114.5	2619.71	24.99
115.0	2726.02	25.08
115.5	2869.02	25.17
116.0	2868.67	25.25
116.5	2867.91	25.34
117.0	3009.46	25.43
117.5	3188.38	25.52
118.0	3190.10	25.60
118.5	3189.28	25.69
119.0	3531.53	25.78
119.5	3496.92	25.87
120.0	3496.23	25.95
120.5	3646.74	26.04
121.0	3799.39	26.13
121.5	3799.80	26.20
122.0	3798.63	26.29
122.5	3796.70	26.38
123.0	3794.36	26.47
123.5	3792.01	26.56
124.0	3789.67	26.65
124.5	3787.32	26.74
125.0	3784.84	26.82
125.5	3782.63	26.90
126.0	3780.77	26.99
126.5	3778.84	27.08
127.0	3778.50	27.17
127.5	3995.54	27.26
128.0	4106.62	27.33
128.5	4107.51	27.42
129.0	4463.07	27.50
129.5	4416.88	27.59
130.0	4416.12	27.66
130.5	4698.80	27.75
131.0	4723.49	27.83
131.5	4723.76	27.90
132.0	5033.54	27.98
132.5	5023.27	28.06
133.0	5022.23	28.13
133.5	5359.87	28.21
134.0	5326.01	28.28
134.5	5324.98	28.35
135.0	5608.28	28.42
135.5	5630.62	28.50
136.0	5866.35	28.56
136.5	5936.81	28.64
137.0	5939.99	28.70
137.5	6140.90	28.76
138.0	6223.70	28.84
138.5	6238.66	28.90
139.0	6238.04	28.96
139.5	6231.84	29.04
140.0	6408.27	29.10
140.5	6477.84	29.17
141.0	6407.31	29.24
141.5	6447.23	29.31
142.0	6444.26	29.39
142.5	6441.30	29.47
143.0	6437.85	29.55
143.5	6432.96	29.62
144.0	6428.41	29.70
144.5	6422.96	29.78
145.0	6417.72	29.87
145.5	6427.03	29.95
146.0	6616.70	30.03
146.5	6700.06	30.11
147.0	6835.88	30.19
147.5	6822.99	30.27
148.0	6536.52	30.34
148.5	6651.04	30.42
149.0	6645.18	30.50
149.5	6634.42	30.58
150.0	6624.35	30.64
150.5	6615.94	30.72
151.0	6608.15	30.79
151.5	6601.95	30.85
152.0	6595.53	30.91
152.5	6589.05	30.98
153.0	6584.78	31.04
153.5	6582.37	31.10
154.0	6579.68	31.17
154.5	6577.19	31.23
155.0	6574.57	31.28
155.5	6572.30	31.33
156.0	6570.71	31.39
156.5	6569.06	31.44
157.0	6567.96	31.49
157.5	6566.99	31.54
158.0	6566.02	31.58
158.5	6565.89	31.63
159.0	6565.27	31.68
159.5	6564.23	31.71
160.0	6563.34	31.76

WELL: SHELL ET AL ARROWHEAD B-41 DST#: ONE INTERVAL: 633 - 641
TEST REFERENCE#: 300277A FILE STARTS: 9:49:30 on February 6, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T
160.5	6562.37	31.81
161.0	6561.82	31.84
161.5	6561.34	31.87
162.0	6560.72	31.91
162.5	6560.10	31.95
163.0	6559.96	31.99
163.5	6559.34	32.02
164.0	6558.72	32.05
164.5	6558.44	32.08
165.0	6557.89	32.12
165.5	6557.61	32.15
166.0	6556.79	32.16
166.5	6556.30	32.20
167.0	6556.03	32.23
167.5	6555.54	32.25
168.0	6555.34	32.28
168.5	6555.34	32.29
169.0	6554.65	32.33
169.5	6554.23	32.34
170.0	6554.17	32.38
170.5	6552.86	32.39
171.0	6552.79	32.41
171.5	6553.96	32.42
172.0	6566.78	32.46
172.5	6568.78	32.47
173.0	6573.13	32.49
173.5	6570.71	32.51
174.0	6567.96	32.52
174.5	6565.20	32.54
175.0	6562.99	32.56
175.5	6561.13	32.57
176.0	6559.89	32.59
176.5	6558.85	32.60
177.0	6558.03	32.62
177.5	6557.41	32.64
178.0	6557.48	32.64
178.5	6559.82	32.65
179.0	6557.06	32.67
179.5	6554.65	32.69
180.0	6554.58	32.70
180.5	6553.96	32.70
181.0	6553.82	32.72
181.5	6553.41	32.73
182.0	6552.99	32.73
182.5	6552.58	32.75
183.0	6551.89	32.77
183.5	6551.82	32.77
184.0	6551.61	32.78
184.5	6549.89	32.78
185.0	6550.17	32.80
185.5	6550.79	32.82
186.0	6550.72	32.82
186.5	6549.34	32.83
187.0	6548.79	32.83
187.5	6548.65	32.85
188.0	6548.58	32.85
188.5	6548.51	32.87
189.0	6548.10	32.87
189.5	6547.75	32.87
190.0	6547.34	32.88
190.5	6547.13	32.88
191.0	6546.86	32.90
191.5	6546.37	32.90
192.0	6545.82	32.90
192.5	6545.69	32.91
193.0	6545.48	32.91
193.5	6545.13	32.93
194.0	6544.86	32.93
194.5	6544.72	32.93
195.0	6544.44	32.95
195.5	6544.24	32.95
196.0	6543.62	32.95
196.5	6543.20	32.95
197.0	6542.93	32.96
197.5	6542.58	32.96
198.0	6542.17	32.96
198.5	6541.82	32.98
199.0	6541.41	32.98
199.5	6541.27	32.98
200.0	6541.07	32.98
200.5	6540.51	33.00
201.0	6540.03	33.00
201.5	6539.89	33.00
202.0	6539.62	33.00
202.5	6539.27	33.00
203.0	6539.00	33.01
203.5	6538.65	33.01
204.0	6538.38	33.01
204.5	6537.76	33.01
205.0	6537.55	33.01
205.5	6537.14	33.01
206.0	6536.86	33.03
206.5	6536.58	33.03
207.0	6535.69	33.03
207.5	6535.14	33.03
208.0	6535.00	33.03
208.5	6534.79	33.03
209.0	6534.52	33.03
209.5	6534.31	33.05
210.0	6533.90	33.05
210.5	6533.48	33.05
211.0	6868.01	33.05
211.5	6825.06	33.05
212.0	6916.55	33.05
212.5	6792.72	33.05
213.0	6797.27	33.05
213.5	6774.18	33.05
214.0	6755.08	33.06
214.5	6779.76	33.06
215.0	6753.28	33.06
215.5	6741.98	33.06
216.0	6762.87	33.06
216.5	6752.87	33.06
217.0	6757.84	33.06
217.5	6750.73	33.06
218.0	6762.32	33.06
218.5	6752.53	33.06
219.0	6759.08	33.06
219.5	6749.49	33.06
220.0	6735.98	33.06
220.5	6731.43	33.08
221.0	6730.88	33.08
221.5	6725.02	33.08
222.0	6718.05	33.08
222.5	6510.11	33.08
223.0	6785.07	33.08
223.5	6808.17	33.08
224.0	6799.13	33.08
224.5	6807.20	33.08
225.0	4910.95	33.08
225.5	2457.96	33.06
226.0	2691.41	33.06
226.5	2848.68	33.06
227.0	2774.22	33.06
227.5	2851.99	33.06
228.0	2837.51	33.05
228.5	2866.05	33.03
229.0	2885.84	33.00
229.5	2894.46	32.96
230.0	3780.63	32.93
230.5	4691.42	32.88
231.0	4728.45	32.83
231.5	4770.09	32.77
232.0	4789.67	32.70
232.5	4809.05	32.64
233.0	4825.25	32.57
233.5	4836.76	32.51
234.0	4845.93	32.44
234.5	4854.83	32.39
235.0	4861.52	32.33
235.5	4867.58	32.28
236.0	4872.89	32.23
236.5	4877.24	32.18
237.0	4883.65	32.13
237.5	4886.41	32.08
238.0	4888.34	32.05
238.5	4891.10	32.02
239.0	4893.37	31.99
239.5	4895.78	31.95
240.0	4898.20	31.94
240.5	4900.20	31.91
241.0	4902.54	31.89
241.5	4904.06	31.87
242.0	4905.51	31.86
242.5	4907.02	31.84
243.0	4908.68	31.83
243.5	4910.26	31.81
244.0	4912.12	31.81
244.5	4913.78	31.79
245.0	4915.43	31.79
245.5	4917.02	31.78
246.0	4918.95	31.78
246.5	4920.60	31.78
247.0	4922.05	31.78
247.5	4923.77	31.76
248.0	4925.25	31.76
248.5	4927.15	31.76
249.0	4928.19	31.76
249.5	4929.57	31.76
250.0	4930.95	31.76
250.5	4932.74	31.76
251.0	4935.08	31.78
251.5	4935.01	31.78
252.0	4935.77	31.78
252.5	4936.60	31.78
253.0	4937.29	31.78
253.5	4937.91	31.78
254.0	4938.39	31.79
254.5	4938.67	31.79
255.0	4939.29	31.79
255.5	4941.98	31.79
256.0	4943.77	31.79
256.5	4944.74	31.81
257.0	5115.93	31.81
257.5	5133.37	31.81
258.0	5131.93	31.83
258.5	5070.98	31.83
259.0	5024.30	31.83
259.5	4997.69	31.83
260.0	4980.38	31.84
260.5	4968.80	31.84
261.0	4962.11	31.84
261.5	4956.80	31.86
262.0	4952.87	31.86
262.5	4949.77	31.86
263.0	4947.70	31.86
263.5	4946.32	31.87
264.0	4945.56	31.87
264.5	4945.29	31.87
265.0	4945.36	31.87
265.5	4945.98	31.89
266.0	4946.11	31.89
266.5	4946.11	31.89
267.0	4946.25	31.89
267.5	4946.46	31.91
268.0	4946.80	31.91
268.5	4946.94	31.91
269.0	4947.36	31.91
269.5	4947.36	31.92
270.0	4947.49	31.92
270.5	4947.49	31.92
271.0	4947.63	31.92
271.5	4947.63	31.94
272.0	4947.77	31.94
272.5	4948.05	31.94
273.0	4948.18	31.94
273.5	4948.25	31.95
274.0	4948.32	31.95
274.5	4948.80	31.95
275.0	4948.73	31.95
275.5	4948.53	31.95
276.0	4948.73	31.97
276.5	4948.73	31.97
277.0	4949.15	31.97
277.5	4949.15	31.97
278.0	4949.29	31.97
278.5	4950.25	31.99
279.0	4949.98	31.99
279.5	4949.84	31.99
280.0	4949.84	31.99
280.5	4949.70	31.99
281.0	4949.70	31.99
281.5	4949.84	32.00
282.0	4949.84	32.00
282.5	4949.70	32.00
283.0	4949.84	32.00
283.5	4949.98	32.00
284.0	4949.98	32.00
284.5	4950.04	32.02
285.0	4950.11	32.02
285.5	4950.18	32.02
286.0	4950.25	32.02
286.5	4950.32	32.02
287.0	4950.46	32.02
287.5	4950.39	32.02
288.0	4950.46	32.04
288.5	4950.46	32.04
289.0	4950.53	32.04
289.5	4950.73	32.04
290.0	4878.41	32.04
290.5	5849.46	32.04
291.0	5673.23	32.04
291.5	5613.18	32.04
292.0	5555.05	32.05
292.5	3222.23	32.05
293.0	3167.28	32.05
293.5	3174.11	32.05
294.0	3190.17	32.05
294.5	3217.27	32.05
295.0	3258.15	32.04
295.5	3297.66	32.02
296.0	3333.86	32.00
296.5	3371.99	31.97
297.0	3411.84	31.94
297.5	3451.41	31.91
298.0	3489.54	31.86
298.5	3526.77	31.79
299.0	3562.00	31.74
299.5	3596.48	31.68
300.0	3628.68	31.62
300.5	3660.25	31.55
301.0	3691.76	31.49
301.5	3723.00	31.42
302.0	3752.57	31.36
302.5	3781.05	31.28
303.0	3809.94	31.23
303.5	3838.41	31.17
304.0	3864.13	31.10
304.5	3891.29	31.06
305.0	3915.63	30.99
305.5	3940.73	30.95
306.0	3964.79	30.90
306.5	3987.68	30.85
307.0	4009.61	30.80
307.5	4032.50	30.75
308.0	4053.87	30.72
308.5	4074.83	30.69
309.0	4093.65	30.64
309.5	4113.10	30.61
310.0	4132.68	30.58
310.5	4149.98	30.55
311.0	4168.12	30.53
311.5	4183.84	30.50
312.0	4199.76	30.49
312.5	4217.90	30.45
313.0	4233.89	30.44
313.5	4252.30	30.42
314.0	4264.64	30.39
314.5	4276.57	30.38
315.0	4291.46	30.36
315.5	4303.60	30.34
316.0	4320.01	30.34
316.5	4330.76	30.33
317.0	4345.38	30.31
317.5	4355.93	30.30
318.0	4366.82	30.30
318.5	4377.44	30.28
319.0	4388.20	30.28
319.5	4399.99	30.27
320.0	4409.98	30.27

WELL: SHELL ET AL ARROWHEAD B-41 DST#: ONE INTERVAL: 633 - 641
TEST REFERENCE#: 300277A FILE STARTS: 9:49:30 on February 6, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPan), T=Temperature (Deg. C)

ET	P	T
320.5	4419.77	30.25
321.0	4432.94	30.25
321.5	4441.56	30.25
322.0	4451.42	30.23
322.5	4460.25	30.23
323.0	4469.07	30.23
323.5	4478.52	30.22
324.0	4487.07	30.22
324.5	4495.96	30.22
325.0	4502.72	30.22
325.5	4511.27	30.22
326.0	4519.20	30.22
326.5	4527.19	30.22
327.0	4533.95	30.22
327.5	4541.67	30.20
328.0	4548.64	30.20
328.5	4556.43	30.20
329.0	4563.67	30.20
329.5	4570.84	30.20
330.0	4577.66	30.20
330.5	4583.80	30.20
331.0	4589.59	30.20
331.5	4595.80	30.20
332.0	4601.24	30.22
332.5	4607.31	30.22
333.0	4612.55	30.22
333.5	4618.48	30.22
334.0	4623.72	30.22
334.5	4628.68	30.22
335.0	4633.58	30.22
335.5	4638.06	30.22
336.0	4643.23	30.22
336.5	4647.57	30.22
337.0	4652.61	30.22
337.5	4657.16	30.23
338.0	4662.12	30.23
338.5	4666.19	30.23
339.0	4670.60	30.23
339.5	4675.02	30.23
340.0	4679.08	30.23
340.5	4683.08	30.23
341.0	4687.15	30.25
341.5	4691.22	30.25
342.0	4695.56	30.25
342.5	4699.91	30.25
343.0	4703.90	30.25
343.5	4707.28	30.25
344.0	4710.94	30.27
344.5	4714.52	30.27
345.0	4718.18	30.27
345.5	4721.55	30.27
346.0	4724.66	30.27
346.5	4728.10	30.28
347.0	4731.34	30.28
347.5	4734.31	30.28
348.0	4737.41	30.28
348.5	4740.58	30.28
349.0	4743.13	30.30
349.5	4746.10	30.30
350.0	4749.06	30.30
350.5	4752.03	30.30
351.0	4754.86	30.30
351.5	4757.27	30.31
352.0	4969.76	30.31
352.5	4866.83	30.31
353.0	4865.52	30.31
353.5	4869.17	30.33
354.0	4869.45	30.33
354.5	4872.00	30.33
355.0	4874.41	30.33
355.5	4876.62	30.34
356.0	4878.62	30.34
356.5	4880.75	30.34
357.0	4882.75	30.34
357.5	4884.82	30.36
358.0	4886.75	30.36
358.5	4888.61	30.36
359.0	4890.47	30.38
359.5	4892.47	30.38
360.0	4894.20	30.38
360.5	4896.06	30.39
361.0	4897.78	30.39
361.5	4899.71	30.39
362.0	4901.37	30.39
362.5	4902.95	30.41
363.0	4904.68	30.41
363.5	4906.06	30.41
364.0	4907.50	30.42
364.5	4908.95	30.42
365.0	4910.40	30.42
365.5	4911.50	30.42
366.0	4912.54	30.44
366.5	4913.57	30.44
367.0	4914.61	30.44
367.5	4915.50	30.45
368.0	4916.26	30.45
368.5	4917.43	30.45
369.0	4918.19	30.47
369.5	4918.95	30.47
370.0	4919.78	30.47
370.5	4920.54	30.49
371.0	4921.36	30.49
371.5	4922.05	30.49
372.0	4922.81	30.50
372.5	4923.64	30.50
373.0	4924.26	30.50
373.5	4924.95	30.52
374.0	4925.64	30.52
374.5	4926.26	30.52
375.0	4926.95	30.53
375.5	4927.57	30.53
376.0	4928.19	30.53
376.5	4928.74	30.55
377.0	4929.43	30.55
377.5	4930.05	30.55
378.0	4930.53	30.56
378.5	4931.08	30.56
379.0	4931.64	30.56
379.5	4932.12	30.58
380.0	4932.53	30.58
380.5	4933.08	30.58
381.0	4933.57	30.60
381.5	4934.12	30.60
382.0	4934.60	30.60
382.5	4935.01	30.61
383.0	4935.50	30.61
383.5	4935.77	30.61
384.0	4936.19	30.61
384.5	4936.53	30.63
385.0	4937.01	30.63
385.5	4937.36	30.63
386.0	4937.63	30.64
386.5	4938.05	30.64
387.0	4938.39	30.64
387.5	4938.74	30.66
388.0	4938.94	30.66
388.5	4939.43	30.66
389.0	4939.63	30.68
389.5	4939.84	30.68
390.0	4940.32	30.68
390.5	4940.53	30.69
391.0	4940.74	30.69
391.5	4940.94	30.69
392.0	4941.22	30.69
392.5	4941.63	30.71
393.0	4941.77	30.71
393.5	4942.12	30.71
394.0	4942.25	30.72
394.5	4942.60	30.72
395.0	4942.74	30.72
395.5	4943.01	30.72
396.0	4943.29	30.74
396.5	4943.49	30.74
397.0	4943.70	30.74
397.5	4943.84	30.75
398.0	4944.05	30.75
398.5	4944.18	30.75
399.0	4944.32	30.75
399.5	4944.67	30.77
400.0	4944.80	30.77
400.5	4944.87	30.77
401.0	4945.22	30.77
401.5	4945.29	30.79
402.0	4945.43	30.79
402.5	4945.56	30.79
403.0	4945.77	30.79
403.5	4945.98	30.80
404.0	4946.05	30.80
404.5	4946.25	30.80
405.0	4946.46	30.80
405.5	4946.60	30.82
406.0	4946.67	30.82
406.5	4946.87	30.82
407.0	4946.87	30.82
407.5	4947.01	30.83
408.0	4947.22	30.83
408.5	4947.36	30.83
409.0	4947.42	30.83
409.5	4947.49	30.85
410.0	4947.70	30.85
410.5	4947.84	30.85
411.0	4947.84	30.85
411.5	4948.05	30.85
412.0	4948.18	30.87
412.5	4948.25	30.87
413.0	4948.39	30.87
413.5	4948.60	30.87
414.0	4948.53	30.88
414.5	4948.73	30.88
415.0	4948.87	30.88
415.5	4949.15	30.88
416.0	4949.15	30.88
416.5	4949.08	30.90
417.0	4949.15	30.90
417.5	4949.15	30.90
418.0	4949.22	30.90
418.5	4949.15	30.90
419.0	4949.42	30.91
419.5	4949.42	30.91
420.0	4949.63	30.91
420.5	4949.63	30.91
421.0	4949.77	30.91
421.5	4949.98	30.93
422.0	4949.84	30.93
422.5	4950.04	30.93
423.0	4950.11	30.93
423.5	4950.11	30.93
424.0	4950.25	30.93
424.5	4950.39	30.95
425.0	4950.53	30.95
425.5	4950.53	30.95
426.0	4950.67	30.95
426.5	4950.67	30.95
427.0	4950.80	30.95
427.5	4950.80	30.96
428.0	4950.94	30.96
428.5	4950.94	30.96
429.0	4951.01	30.96
429.5	4950.94	30.96
430.0	4951.15	30.96
430.5	4951.15	30.98
431.0	4951.35	30.98
431.5	4951.35	30.98
432.0	4951.35	30.98
432.5	4951.35	30.98
433.0	4951.42	30.98
433.5	4951.56	30.99
434.0	4951.63	30.99
434.5	4951.63	30.99
435.0	4951.63	30.99
435.5	4951.70	30.99
436.0	4951.84	30.99
436.5	4951.84	30.99
437.0	4951.98	31.01
437.5	4952.04	31.01
438.0	4952.04	31.01
438.5	4951.98	31.01
439.0	4952.04	31.01
439.5	4952.18	31.01
440.0	4952.18	31.01
440.5	4952.18	31.02
441.0	4952.32	31.02
441.5	4952.32	31.02
442.0	4952.39	31.02
442.5	4952.53	31.02
443.0	4952.46	31.02
443.5	4952.60	31.02
444.0	4952.53	31.04
444.5	4952.60	31.04
445.0	4952.66	31.04
445.5	4952.73	31.04
446.0	6319.88	31.04
446.5	6441.78	31.04
447.0	6571.89	31.04
447.5	6414.62	31.06
448.0	5977.70	31.06
448.5	6456.05	31.06
449.0	6904.14	31.06
449.5	6415.31	31.06
450.0	6583.61	31.06
450.5	6576.16	31.06
451.0	6566.85	31.06
451.5	6562.99	31.06
452.0	6560.99	31.07
452.5	6558.99	31.07
453.0	6557.41	31.07
453.5	6556.23	31.07
454.0	6554.92	31.07
454.5	6554.44	31.07
455.0	6554.03	31.07
455.5	6561.68	31.07
456.0	6557.13	31.07
456.5	6554.92	31.09
457.0	6553.96	31.09
457.5	6553.48	31.09
458.0	6553.20	31.09
458.5	6250.45	31.09
459.0	6184.20	31.09
459.5	5679.57	31.09
460.0	5849.73	31.10
460.5	6108.77	31.10
461.0	6229.49	31.10
461.5	6207.50	31.10
462.0	6098.70	31.12
462.5	6276.65	31.12
463.0	6229.15	31.14
463.5	6211.36	31.15
464.0	6186.89	31.15
464.5	6248.25	31.17
465.0	6237.08	31.18
465.5	6232.39	31.20
466.0	6231.22	31.20
466.5	6229.43	31.22
467.0	6224.74	31.23
467.5	6134.14	31.25
468.0	6103.18	31.25
468.5	6066.92	31.26
469.0	6031.48	31.28
469.5	6003.90	31.28
470.0	5984.80	31.30
470.5	5962.26	31.30
471.0	5937.57	31.31
471.5	5912.54	31.31
472.0	5996.87	31.33
472.5	5996.04	31.33
473.0	5991.14	31.33
473.5	5986.87	31.34
474.0	5987.70	31.34
474.5	5984.39	31.34
475.0	5981.35	31.34
475.5	5898.76	31.36
476.0	5896.00	31.36
476.5	5871.25	31.36
477.0	5840.36	31.36
477.5	5800.09	31.36
478.0	5771.27	31.38
478.5	5738.04	31.38
479.0	5702.05	31.38
479.5	5666.40	31.38
480.0	5729.84	31.38

WELL: SHELL ET AL ARROWHEAD B-41 DST#: ONE INTERVAL: 633 - 641
TEST REFERENCE#: 300277A FILE STARTS: 9:49:30 on February 6, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T
480.5	5718.39	31.38
481.0	5706.60	31.38
481.5	5699.57	31.38
482.0	5698.33	31.39
482.5	5692.26	31.39
483.0	5615.73	31.39
483.5	5562.02	31.39
484.0	5507.27	31.39
484.5	5448.53	31.39
485.0	5385.38	31.39
485.5	5426.33	31.39
486.0	5422.12	31.39
486.5	5411.16	31.39
487.0	5404.96	31.39
487.5	5398.89	31.39
488.0	5392.62	31.39
488.5	5387.51	31.39
489.0	5383.93	31.39
489.5	5380.76	31.39
490.0	5377.79	31.39
490.5	5374.97	31.39
491.0	5372.28	31.38
491.5	5370.00	31.38
492.0	5367.79	31.38
492.5	5366.07	31.38
493.0	5364.55	31.38
493.5	5363.18	31.36
494.0	5362.07	31.36
494.5	5360.83	31.36
495.0	5359.93	31.36
495.5	5359.11	31.34
496.0	5358.56	31.34
496.5	5357.87	31.34
497.0	5357.38	31.33
497.5	5357.11	31.33
498.0	5356.76	31.33
498.5	5356.28	31.31
499.0	5356.14	31.31
499.5	5355.66	31.30
500.0	5355.45	31.30
500.5	5355.32	31.30
501.0	5355.04	31.28
501.5	5354.69	31.28
502.0	5354.35	31.26
502.5	5353.52	31.26
503.0	5353.73	31.25
503.5	5353.59	31.25
504.0	5354.07	31.25
504.5	5357.45	31.23
505.0	5358.21	31.23
505.5	5357.94	31.22
506.0	5357.38	31.22
506.5	5356.97	31.20
507.0	5356.56	31.20
507.5	5356.28	31.20
508.0	5355.94	31.18
508.5	5354.01	31.18
509.0	5351.39	31.17
509.5	5349.80	31.17
510.0	5349.39	31.15
510.5	5349.59	31.15
511.0	5349.59	31.15
511.5	5349.59	31.14
512.0	5349.32	31.14
512.5	5349.59	31.12
513.0	5350.35	31.12
513.5	5349.94	31.12
514.0	5348.97	31.10
514.5	5348.42	31.10
515.0	5348.14	31.10
515.5	5348.14	31.09
516.0	5347.87	31.09
516.5	5347.52	31.09
517.0	5372.07	31.07
517.5	5369.45	31.07
518.0	5365.66	31.07
518.5	5362.97	31.06
519.0	5361.11	31.06
519.5	5359.93	31.06
520.0	5358.97	31.04
520.5	5358.14	31.04
521.0	5357.25	31.04
521.5	5356.69	31.02
522.0	5356.00	31.02
522.5	5355.52	31.02
523.0	5355.04	31.02
523.5	5354.49	31.01
524.0	5354.01	31.01
524.5	5353.66	31.01
525.0	5353.32	30.99
525.5	5353.11	30.99
526.0	5352.70	30.99
526.5	5352.42	30.99
527.0	5352.07	30.98
527.5	5351.80	30.98
528.0	5351.59	30.98
528.5	5351.32	30.98
529.0	5350.97	30.96
529.5	5350.76	30.96
530.0	5350.42	30.96
530.5	5350.21	30.96
531.0	5349.94	30.96
531.5	5349.59	30.95
532.0	5188.95	30.95
532.5	5254.86	30.95
533.0	5211.35	30.95
533.5	5151.92	30.93
534.0	5222.87	30.93
534.5	5218.39	30.93
535.0	5215.28	30.93
535.5	5207.36	30.93
536.0	5124.07	30.91
536.5	5092.83	30.91
537.0	5203.49	30.91
537.5	5226.18	30.91
538.0	5109.86	30.91
538.5	5050.29	30.90
539.0	4978.93	30.90
539.5	4922.47	30.90
540.0	4859.59	30.90
540.5	4929.71	30.88
541.0	4927.15	30.88
541.5	4924.33	30.88
542.0	4917.36	30.88
542.5	4843.18	30.87
543.0	4818.84	30.87
543.5	5018.72	30.87
544.0	4918.95	30.85
544.5	4904.33	30.85
545.0	4774.92	30.85
545.5	4676.39	30.83
546.0	4568.15	30.83
546.5	4625.86	30.82
547.0	4619.10	30.82
547.5	4612.27	30.80
548.0	4605.65	30.80
548.5	4601.79	30.79
549.0	4596.69	30.79
549.5	4611.31	30.77
550.0	4604.69	30.75
550.5	4546.29	30.75
551.0	4508.78	30.74
551.5	4411.50	30.72
552.0	4305.53	30.71
552.5	4316.15	30.71
553.0	4310.42	30.69
553.5	4311.66	30.68
554.0	4304.84	30.66
554.5	4297.88	30.64
555.0	4291.39	30.64
555.5	4285.60	30.63
556.0	4280.78	30.61
556.5	4277.67	30.60
557.0	4223.21	30.58
557.5	4124.82	30.56
558.0	4019.95	30.55
558.5	4007.33	30.53
559.0	4001.89	30.52
559.5	4003.33	30.50
560.0	3997.20	30.49
560.5	3990.58	30.47
561.0	3973.13	30.45
561.5	3919.98	30.42
562.0	3848.82	30.41
562.5	3747.54	30.39
563.0	3695.00	30.38
563.5	3695.21	30.36
564.0	3694.45	30.33
564.5	3688.80	30.31
565.0	3682.73	30.30
565.5	3640.81	30.28
566.0	3563.11	30.25
566.5	3459.96	30.23
567.0	3349.65	30.22
567.5	3389.84	30.19
568.0	3387.02	30.17
568.5	3382.19	30.14
569.0	3376.40	30.12
569.5	3371.23	30.09
570.0	3366.75	30.08
570.5	3363.02	30.06
571.0	3360.54	30.03
571.5	3358.68	30.01
572.0	3357.64	29.98
572.5	3356.89	29.95
573.0	3356.06	29.94
573.5	3355.37	29.90
574.0	3354.61	29.89
574.5	3354.13	29.86
575.0	3353.65	29.84
575.5	3353.23	29.81
576.0	3352.75	29.78
576.5	3352.54	29.76
577.0	3356.89	29.73
577.5	3357.92	29.70
578.0	3358.40	29.69
578.5	3356.33	29.65
579.0	3354.20	29.64
579.5	3374.47	29.61
580.0	3372.19	29.58
580.5	3366.26	29.56
581.0	3361.23	29.53
581.5	3355.58	29.51
582.0	3351.09	29.48
582.5	3348.48	29.45
583.0	3347.92	29.44
583.5	3347.72	29.41
584.0	3351.99	29.39
584.5	3350.34	29.36
585.0	3426.94	29.34
585.5	3399.08	29.33
586.0	3400.87	29.30
586.5	3401.98	29.28
587.0	3402.25	29.25
587.5	3396.32	29.24
588.0	3394.32	29.22
588.5	3392.05	29.19
589.0	3391.57	29.17
589.5	3391.57	29.16
590.0	3391.36	29.14
590.5	3390.95	29.11
591.0	3390.19	29.10
591.5	3389.08	29.08
592.0	3387.91	29.07
592.5	3386.74	29.05
593.0	3385.36	29.04
593.5	3384.05	29.00
594.0	3382.53	28.99
594.5	3380.95	28.97
595.0	3379.36	28.96
595.5	3377.64	28.94
596.0	3376.05	28.93
596.5	3374.19	28.91
597.0	3372.47	28.90
597.5	3370.68	28.88
598.0	3369.02	28.87
598.5	3368.06	28.85
599.0	3366.33	28.84
599.5	3364.61	28.82
600.0	3362.95	28.80
600.5	3361.44	28.79
601.0	3359.85	28.77
601.5	3358.27	28.76
602.0	3323.31	28.74
602.5	3356.13	28.74
603.0	3353.71	28.73
603.5	3350.89	28.71
604.0	3348.27	28.70
604.5	3346.82	28.68
605.0	3345.72	28.67
605.5	3345.03	28.65
606.0	3344.34	28.65
606.5	3343.37	28.64
607.0	3342.61	28.62
607.5	3341.79	28.60
608.0	3341.10	28.60
608.5	3340.41	28.59
609.0	3339.99	28.57
609.5	3339.51	28.56
610.0	3339.17	28.56
610.5	3338.55	28.54
611.0	3318.14	28.53
611.5	3333.38	28.51
612.0	3609.65	28.51
612.5	4343.72	28.50
613.0	4427.70	28.48
613.5	4313.80	28.48
614.0	4167.08	28.47
614.5	4164.19	28.45
615.0	4588.62	28.45
615.5	4339.73	28.44
616.0	4465.73	28.42
616.5	4906.13	28.42
617.0	5008.51	28.41
617.5	5130.55	28.39
618.0	5203.29	28.39
618.5	5201.36	28.38
619.0	5219.83	28.38
619.5	5297.68	28.36
620.0	5224.38	28.36
620.5	5228.80	28.35
621.0	5297.81	28.33
621.5	5315.05	28.33
622.0	5270.86	28.31
622.5	5282.65	28.31
623.0	5322.22	28.30
623.5	5330.01	28.30
624.0	5248.59	28.28
624.5	5292.16	28.28
625.0	5498.24	28.27
625.5	4676.19	28.27
626.0	3924.80	28.25
626.5	3403.22	28.24
627.0	3408.87	28.24
627.5	3413.49	28.22
628.0	3414.11	28.22
628.5	3414.80	28.21
629.0	3415.01	28.21
629.5	3415.08	28.19
630.0	3415.22	28.19
630.5	3415.01	28.18
631.0	3415.01	28.18
631.5	3414.73	28.16
632.0	3414.32	28.16
632.5	3414.18	28.15
633.0	3413.77	28.15
633.5	3413.56	28.13
634.0	3413.22	28.13
634.5	3412.87	28.12
635.0	3412.53	28.12
635.5	3412.46	28.10
636.0	3412.04	28.10
636.5	3411.91	28.09
637.0	3411.49	28.09
637.5	3407.29	28.07
638.0	3411.29	28.07
638.5	3412.60	28.07
639.0	3410.73	28.06
639.5	3410.67	28.06
640.0	3409.42	28.04

WELL: SHELL ET AL ARROWHEAD B-41 DST#: ONE INTERVAL: 633 - 641
TEST REFERENCE#: 300277A FILE STARTS: 9:49:30 on February 6, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T
640.5	3409.49	28.04
641.0	3409.49	28.04
641.5	3409.22	28.03
642.0	3408.94	28.03
642.5	3408.53	28.01
643.0	3408.11	28.01
643.5	3407.70	28.01
644.0	3407.22	28.00
644.5	3406.53	28.00
645.0	3308.62	28.00
645.5	3366.06	27.98
646.0	3372.47	27.98
646.5	3293.59	27.98
647.0	3338.62	27.97
647.5	3339.99	27.97
648.0	3340.41	27.97
648.5	3137.91	27.95
649.0	3070.55	27.95
649.5	3074.00	27.95
650.0	3072.00	27.94
650.5	3070.07	27.94
651.0	3072.20	27.94
651.5	3072.62	27.92
652.0	3072.48	27.92
652.5	3072.07	27.92
653.0	3071.93	27.90
653.5	3063.65	27.90
654.0	3065.24	27.90
654.5	3065.03	27.89
655.0	3063.86	27.89
655.5	3061.93	27.89
656.0	3060.00	27.87
656.5	3058.21	27.87
657.0	3056.62	27.87
657.5	3055.11	27.86
658.0	3053.66	27.86
658.5	3052.35	27.84
659.0	3051.31	27.84
659.5	3050.28	27.83
660.0	3049.18	27.83
660.5	3048.00	27.81
661.0	3049.38	27.81
661.5	3052.83	27.80
662.0	3053.52	27.78
662.5	3053.11	27.78
663.0	3001.46	27.77
663.5	2870.40	27.77
664.0	2892.67	27.75
664.5	2882.81	27.74
665.0	2881.57	27.74
665.5	2732.92	27.72
666.0	2531.04	27.71
666.5	2576.27	27.69
667.0	2573.44	27.69
667.5	2573.17	27.68
668.0	2383.01	27.66
668.5	2259.46	27.66
669.0	2269.32	27.65
669.5	2271.18	27.63
670.0	2272.63	27.62
670.5	2272.01	27.62
671.0	2271.73	27.60
671.5	2271.11	27.59
672.0	2271.18	27.57
672.5	2268.70	27.56
673.0	2265.59	27.56
673.5	2191.75	27.54
674.0	2002.01	27.53
674.5	1966.85	27.51
675.0	1971.12	27.50
675.5	1973.53	27.48
676.0	1973.40	27.47
676.5	1971.74	27.45
677.0	1970.29	27.44
677.5	1967.81	27.43
678.0	1965.33	27.42
678.5	1962.92	27.41
679.0	1960.71	27.40
679.5	1937.54	27.31
680.0	1843.91	27.02

ET	P	T
680.5	1652.59	27.30
681.0	1657.62	27.29
681.5	1673.06	27.27
682.0	1675.06	27.24
682.5	1674.86	27.23
683.0	1673.68	27.21
683.5	1672.65	27.18
684.0	1671.96	27.17
684.5	1670.99	27.15
685.0	1670.17	27.12
685.5	1669.41	27.11
686.0	1668.24	27.09
686.5	1640.52	27.06
687.0	1563.23	27.05
687.5	1327.02	27.03
688.0	1341.84	27.00
688.5	1359.22	26.99
689.0	1365.28	26.96
689.5	1365.42	26.94
690.0	1364.73	26.93
690.5	1363.63	26.90
691.0	1305.99	26.88
691.5	1023.24	26.87
692.0	1022.00	26.84
692.5	1039.37	26.82
693.0	1051.23	26.81
693.5	1055.44	26.78
694.0	1047.78	26.77
694.5	1040.13	26.75
695.0	1039.85	26.72
695.5	1039.51	26.71
696.0	1039.10	26.69
696.5	1038.68	26.66
697.0	863.21	26.65
697.5	710.42	26.63
698.0	722.70	26.62
698.5	737.87	26.59
699.0	748.41	26.57
699.5	750.69	26.56
700.0	751.66	26.54
700.5	722.84	26.51
701.0	486.07	26.50
701.5	414.71	26.48
702.0	425.33	26.47
702.5	440.64	26.45
703.0	451.46	26.44
703.5	454.42	26.42
704.0	456.08	26.41
704.5	457.60	26.39
705.0	459.11	26.38
705.5	460.42	26.37
706.0	461.80	26.35
706.5	451.94	26.34
707.0	346.45	26.34
707.5	236.35	26.32
708.0	128.58	26.31
708.5	130.10	26.31
709.0	140.37	26.29
709.5	143.89	26.28
710.0	144.58	26.28
710.5	144.99	26.26
711.0	145.34	26.26
711.5	145.61	26.25
712.0	146.02	26.25
712.5	146.30	26.23
713.0	146.78	26.23
713.5	147.13	26.22
714.0	147.[illegible]	26.22
[illegible]	[illegible]	[illegible]

ET	P	T
720.5	150.71	26.23
721.0	150.99	26.23
721.5	151.13	26.25
722.0	151.40	26.25
722.5	151.54	26.26
723.0	151.89	26.26
723.5	152.16	26.28
724.0	152.30	26.28
724.5	152.57	26.29
725.0	153.68	26.29
725.5	157.47	26.31
726.0	156.16	26.32
726.5	153.54	26.32
727.0	153.68	26.34
727.5	154.23	26.35
728.0	154.57	26.35
728.5	154.51	26.37
729.0	148.92	26.38
729.5	148.71	26.38
730.0	147.61	26.39
730.5	147.06	26.41
731.0	147.20	26.41
731.5	147.54	26.42
732.0	147.82	26.44
732.5	145.27	26.45
733.0	144.51	26.45
733.5	132.99	26.47
734.0	128.31	26.48
734.5	114.72	26.48
735.0	111.21	26.50
735.5	110.03	26.51
736.0	109.69	26.51
736.5	108.45	26.53
737.0	106.52	26.54
737.5	101.35	26.56
738.0	98.45	26.56
738.5	95.62	26.57
739.0	94.59	26.57
739.5	91.49	26.59
740.0	87.21	26.60
740.5	85.56	26.60
741.0	77.56	26.62
741.5	73.15	26.62
742.0	66.39	26.63
742.5	57.22	26.63
743.0	57.36	26.65
743.5	57.22	26.65
744.0	53.08	26.66
744.5	52.60	26.66
745.0	53.84	26.66
745.5	56.39	26.66
746.0	58.26	26.66
746.5	61.08	26.66
747.0	80.11	26.65
747.5	80.53	26.65
748.0	80.25	26.63
748.5	79.84	26.62
749.0	79.35	26.62
749.5	73.29	26.59
750.0	72.87	26.57
750.5	72.11	26.56
751.0	71.49	26.53
751.5	71.15	26.50
752.0	71.49	26.47
752.5	73.08	26.44
753.0	71.49	26.41
753.5	70.25	26.37
754.0	68.32	26.32
754.5	65.63	26.25
755.0	62.53	26.16
755.5	59.36	26.07
756.0	56.26	25.94
756.5	53.15	25.81
757.0	50.46	25.66
757.5	48.05	25.49
758.0	45.84	25.30
758.5	44.19	25.09
759.0	42.74	24.89
759.5	41.50	24.68
760.0	40.60	24.45

ET	P	T
760.5	40.12	24.22
761.0	39.57	23.98
761.5	39.16	23.74
762.0	38.95	23.50
762.5	39.02	23.26
763.0	39.09	23.02
763.5	39.36	22.78
764.0	39.71	22.55
764.5	40.05	22.33
765.0	40.47	22.09
765.5	40.74	21.87
766.0	41.16	21.66
766.5	41.50	21.44
767.0	41.91	21.23
767.5	42.33	21.03
768.0	42.88	20.83
768.5	43.36	20.64
769.0	43.78	20.45
769.5	44.26	20.27
770.0	44.67	20.10
770.5	44.95	19.92
771.0	45.29	19.75
771.5	45.50	19.58
772.0	45.71	19.42
772.5	45.91	19.27
773.0	46.40	19.12
773.5	47.43	18.98
774.0	48.74	18.84
774.5	49.71	18.72
775.0	50.19	18.60
775.5	50.19	18.49
776.0	49.77	18.37
776.5	49.02	18.25
777.0	47.84	18.15
777.5	46.67	18.04
778.0	45.36	17.91
778.5	44.12	17.78
779.0	42.81	17.65
779.5	41.78	17.53
780.0	40.74	17.39
780.5	39.85	17.25
781.0	38.95	17.10
781.5	38.19	16.96
782.0	37.57	16.81
782.5	37.02	16.65
783.0	36.67	16.50
783.5	36.26	16.35
784.0	35.85	16.19
784.5	35.71	16.04
785.0	35.57	15.88
785.5	35.50	15.73
786.0	35.23	15.57
786.5	35.23	15.41
787.0	35.16	15.26
787.5	35.16	15.12
788.0	35.23	14.97
788.5	35.16	14.83
789.0	35.16	14.67
789.5	35.09	14.53
790.0	35.09	14.38
790.5	34.95	14.24
791.0	35.09	14.10
791.5	35.30	13.95
792.0	35.57	13.81
792.5	35.92	13.67
793.0	36.33	13.53
793.5	36.81	13.38
794.0	37.30	13.26
794.5	37.78	13.11
795.0	38.05	12.99
795.5	38.26	12.86
796.0	38.54	12.73
796.5	38.40	12.60
797.0	38.47	12.49
797.5	38.81	12.37
798.0	39.02	12.24
798.5	39.36	12.13
799.0	40.05	12.01
799.5	40.60	11.90
800.0	41.29	11.80

WELL: SHELL ET AL ARROWHEAD B-41 DST#: ONE INTERVAL: 633 - 641
TEST REFERENCE#: 300277A FILE STARTS: 9:49:30 on February 6, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T	ET	P	T	ET	P	T	ET	P	T
800.5	41.78	11.69	840.5	87.08	10.43	880.5	56.95	7.50	920.5	45.57	4.71
801.0	42.40	11.59	841.0	87.70	10.57	881.0	57.29	7.47	921.0	44.33	4.64
801.5	42.95	11.49	841.5	87.21	10.71	881.5	57.57	7.45	921.5	43.85	4.57
802.0	43.57	11.40	842.0	86.11	10.86	882.0	57.77	7.42	922.0	43.57	4.50
802.5	44.19	11.31	842.5	84.59	10.99	882.5	57.98	7.39	922.5	42.88	4.42
803.0	44.88	11.23	843.0	82.73	11.12	883.0	58.12	7.37	923.0	42.19	4.34
803.5	45.36	11.14	843.5	80.73	11.23	883.5	58.39	7.35	923.5	41.36	4.26
804.0	45.84	11.06	844.0	78.46	11.34	884.0	58.53	7.33	924.0	40.74	4.17
804.5	46.19	10.98	844.5	75.97	11.43	884.5	58.60	7.32	924.5	40.19	4.08
805.0	46.53	10.90	845.0	73.42	11.52	885.0	58.81	7.30	925.0	40.05	3.98
805.5	46.81	10.83	845.5	71.08	11.59	885.5	58.81	7.29	925.5	40.33	3.90
806.0	47.15	10.76	846.0	69.01	11.65	886.0	59.01	7.27	926.0	40.54	3.80
806.5	47.57	10.69	846.5	66.94	11.69	886.5	58.94	7.26	926.5	41.02	3.69
807.0	47.91	10.62	847.0	65.08	11.73	887.0	58.94	7.25	927.0	41.29	3.59
807.5	48.33	10.55	847.5	63.15	11.75	887.5	58.88	7.24	927.5	41.29	3.49
808.0	48.67	10.50	848.0	61.36	11.76	888.0	58.88	7.23	928.0	41.36	3.38
808.5	49.09	10.43	848.5	59.50	11.76	888.5	58.67	7.22	928.5	41.43	3.27
809.0	49.57	10.38	849.0	57.91	11.75	889.0	58.32	7.20	929.0	41.29	3.17
809.5	49.98	10.32	849.5	56.26	11.73	889.5	57.98	7.18	929.5	41.23	3.06
810.0	50.40	10.28	850.0	55.08	11.71	890.0	57.57	7.17	930.0	41.09	2.96
810.5	50.81	10.22	850.5	54.12	11.67	890.5	57.08	7.15	930.5	41.09	2.84
811.0	51.08	10.18	851.0	53.50	11.63	891.0	56.67	7.13	931.0	40.95	2.74
811.5	51.43	10.13	851.5	52.95	11.58	891.5	56.19	7.11	931.5	40.95	2.62
812.0	51.57	10.09	852.0	52.74	11.53	892.0	55.77	7.08	932.0	40.81	2.52
812.5	51.71	10.04	852.5	52.39	11.49	892.5	55.57	7.06	932.5	40.81	2.40
813.0	51.71	10.00	853.0	52.19	11.43	893.0	55.15	7.03	933.0	40.81	2.30
813.5	51.77	9.96	853.5	51.71	11.38	893.5	54.88	7.00	933.5	40.88	2.18
814.0	51.64	9.92	854.0	51.08	11.32	894.0	54.67	6.97	934.0	40.88	2.07
814.5	51.50	9.88	854.5	50.33	11.25	894.5	54.46	6.92	934.5	40.95	1.97
815.0	51.43	9.85	855.0	49.57	11.18	895.0	54.26	6.89	935.0	40.95	1.85
815.5	51.43	9.80	855.5	48.74	11.12	895.5	53.98	6.85	935.5	41.09	1.75
816.0	51.36	9.77	856.0	47.98	11.05	896.0	53.77	6.81	936.0	41.09	1.65
816.5	51.36	9.72	856.5	47.22	10.97	896.5	53.43	6.77	936.5	41.29	1.54
817.0	51.29	9.69	857.0	46.67	10.89	897.0	53.08	6.73	937.0	41.36	1.43
817.5	51.22	9.65	857.5	46.67	10.80	897.5	52.81	6.69	937.5	41.43	1.33
818.0	51.22	9.61	858.0	46.95	10.72	898.0	52.53	6.63	938.0	41.57	1.23
818.5	51.43	9.58	858.5	47.57	10.64	898.5	52.33	6.58	938.5	41.64	1.12
819.0	51.43	9.54	859.0	48.46	10.55	899.0	51.98	6.53	939.0	41.71	1.02
819.5	51.50	9.51	859.5	49.09	10.48	899.5	51.71	6.48	939.5	41.85	0.92
820.0	51.50	9.47	860.0	49.64	10.41	900.0	51.43	6.43	940.0	41.91	0.82
820.5	51.57	9.44	860.5	50.05	10.33	900.5	51.22	6.38	940.5	42.05	0.72
821.0	51.64	9.41	861.0	50.46	10.25	901.0	51.08	6.31	941.0	42.12	0.62
821.5	51.36	9.37	861.5	50.74	10.19	901.5	51.08	6.26	941.5	42.19	0.52
822.0	51.02	9.34	862.0	50.88	10.12	902.0	51.36	6.21	942.0	42.33	0.43
822.5	50.40	9.31	862.5	50.95	10.04	902.5	51.71	6.15	942.5	42.47	0.33
823.0	49.91	9.28	863.0	51.02	9.98	903.0	52.19	6.11	943.0	42.54	0.24
823.5	49.09	9.23	863.5	50.88	9.90	903.5	52.74	6.06	943.5	42.81	0.14
824.0	48.33	9.20	864.0	50.74	9.83	904.0	53.43	6.02	944.0	43.02	5.e-
824.5	47.64	9.16	864.5	50.60	9.76	904.5	54.05	5.98	944.5	43.29	-4.e-
825.0	47.29	9.11	865.0	50.19	9.68	905.0	54.81	5.95	945.0	43.57	-0.13
825.5	47.02	9.06	865.5	49.84	9.59	905.5	55.43	5.90	945.5	43.71	-0.22
826.0	46.95	9.02	866.0	49.71	9.52	906.0	56.12	5.88	946.0	43.98	-0.31
826.5	47.29	8.97	866.5	49.50	9.43	906.5	56.74	5.85	946.5	44.19	-0.41
827.0	48.67	8.93	867.0	49.29	9.35	907.0	57.08	5.84	947.0	44.26	-0.49
827.5	51.77	8.90	867.5	49.22	9.27	907.5	57.36	5.82	947.5	44.40	-0.58
828.0	56.19	8.87	868.0	48.95	9.18	908.0	57.36	5.80	948.0	44.53	-0.67
828.5	60.74	8.87	868.5	48.74	9.09	908.5	57.01	5.78	948.5	44.88	-0.76
829.0	64.81	8.90	869.0	48.60	9.00	909.0	56.53	5.77	949.0	45.16	-0.85
829.5	67.91	8.93	869.5	48.46	8.92	909.5	55.98	5.75	949.5	45.43	-0.93
830.0	70.05	8.98	870.0	48.40	8.82	910.0	55.29	5.72	950.0	45.64	-1.02
830.5	71.29	9.04	870.5	48.40	8.73	910.5	54.60	5.70	950.5	46.05	-1.10
831.0	71.77	9.10	871.0	48.53	8.64	911.0	53.91	5.67	951.0	46.47	-1.19
831.5	71.77	9.17	871.5	48.81	8.55	911.5	53.22	5.65	951.5	46.88	-1.28
832.0	71.42	9.23	872.0	49.15	8.47	912.0	52.67	5.61	952.0	47.29	-1.37
832.5	70.80	9.30	872.5	49.64	8.38	912.5	51.91	5.58	952.5	47.57	-1.45
833.0	70.11	9.36	873.0	50.12	8.31	913.0	51.22	5.54	953.0	47.91	-1.53
833.5	69.29	9.42	873.5	50.74	8.23	913.5	50.60	5.50	953.5	48.40	-1.62
834.0	68.39	9.47	874.0	51.36	8.16	914.0	50.05	5.46	954.0	48.95	-1.70
834.5	67.43	9.53	874.5	51.91	8.08	914.5	49.50	5.41	954.5	49.29	-1.79
835.0	66.67	9.57	875.0	52.46	8.02	915.0	49.02	5.36	955.0	49.84	-1.87
835.5	66.18	9.61	875.5	52.88	7.95	915.5	48.53	5.31	955.5	50.26	-1.95
836.0	65.77	9.66	876.0	53.36	7.89	916.0	48.05	5.26	956.0	50.67	-2.04
836.5	66.80	9.70	876.5	53.84	7.84	916.5	47.71	5.20	956.5	51.08	-2.12
837.0	69.15	9.75	877.0	54.39	7.78	917.0	47.15	5.15	957.0	51.64	-2.19
837.5	72.53	9.81	877.5	54.81	7.73	917.5	46.81	5.09	957.5	52.19	-2.28
838.0	75.35	9.89	878.0	55.15	7.69	918.0	46.33	5.03	958.0	52.74	-2.36
838.5	77.35	9.97	878.5	55.64	7.65	918.5	46.05	4.97	958.5	53.15	-2.43
839.0	79.84	10.07	879.0	55.98	7.60	919.0	45.43	4.91	959.0	53.77	-2.51
839.5	82.94	10.18	879.5	56.32	7.56	919.5	45.02	4.84	959.5	54.46	-2.59
840.0	85.56	10.30	880.0	56.74	7.53	920.0	45.43	4.78	960.0	55.08	-2.67

WELL: SHELL ET AL ARROWHEAD B-41 DST#: ONE INTERVAL: 633 - 641
TEST REFERENCE#: 300277A FILE STARTS: 9:49:30 on February 6, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T
960.5	55.77	-2.74
961.0	56.39	-2.82
961.5	57.08	-2.90
962.0	57.84	-2.96
962.5	58.60	-3.04
963.0	59.36	-3.11
963.5	60.19	-3.18
964.0	61.01	-3.25
964.5	61.98	-3.32
965.0	67.36	-3.39
965.5	70.87	-3.46
966.0	72.39	-3.52
966.5	73.42	-3.59
967.0	73.15	-3.65
967.5	72.67	-3.72
968.0	77.97	-3.79
968.5	128.31	-3.84
969.0	155.26	-3.91
969.5	168.50	-3.98
970.0	175.05	-4.04
970.5	179.46	-4.10
971.0	182.64	-4.16
971.5	185.67	-4.23
972.0	188.22	-4.28
972.5	190.15	-4.34
973.0	191.67	-4.40
973.5	192.43	-4.46
974.0	192.77	-4.52
974.5	192.98	-4.58
975.0	192.91	-4.64
975.5	192.77	-4.69
976.0	192.63	-4.75
976.5	192.29	-4.82
977.0	191.87	-4.86
977.5	191.39	-4.92
978.0	190.91	-4.98
978.5	190.43	-5.03
979.0	189.88	-5.09
979.5	189.19	-5.15
980.0	188.43	-5.20
980.5	187.74	-5.26
981.0	186.98	-5.31
981.5	186.01	-5.37
982.0	185.32	-5.42
982.5	184.50	-5.48
983.0	183.81	-5.53
983.5	182.98	-5.58
984.0	182.15	-5.64
984.5	181.19	-5.69
985.0	180.08	-5.74
985.5	179.05	-5.80
986.0	178.22	-5.85
986.5	177.12	-5.90
987.0	176.36	-5.96
987.5	175.40	-6.00
988.0	174.64	-6.06
988.5	173.81	-6.11
989.0	173.05	-6.16
989.5	172.16	-6.22
990.0	171.33	-6.27
990.5	170.64	-6.32
991.0	169.74	-6.37
991.5	168.98	-6.42
992.0	168.02	-6.48
992.5	167.05	-6.52
993.0	166.09	-6.57
993.5	164.92	-6.63
994.0	163.68	-6.67
994.5	162.43	-6.72
995.0	161.06	-6.77
995.5	159.61	-6.81
996.0	158.09	-6.87
996.5	156.64	-6.91
997.0	155.26	-6.96
997.5	153.95	-7.01
998.0	152.57	-7.05
998.5	151.33	-7.11
999.0	149.89	-7.15
999.5	148.37	-7.20
1000.0	146.58	-7.25
1000.5	144.78	-7.29
1001.0	142.99	-7.34
1001.5	141.20	-7.38
1002.0	139.54	-7.43
1002.5	138.10	-7.48
1003.0	136.65	-7.52
1003.5	135.20	-7.57
1004.0	133.82	-7.61
1004.5	132.44	-7.66
1005.0	131.20	-7.70
1005.5	130.10	-7.74
1006.0	128.86	-7.79
1006.5	127.68	-7.84
1007.0	126.44	-7.87
1007.5	126.86	-7.92
1008.0	131.55	-7.96
1008.5	151.26	-8.00
1009.0	166.71	-8.05
1009.5	174.98	-8.09
1010.0	183.53	-8.13
1010.5	189.67	-8.18
1011.0	191.32	-8.21
1011.5	192.98	-8.26
1012.0	196.22	-8.30
1012.5	199.53	-8.34
1013.0	200.08	-8.38
1013.5	201.39	-8.42
1014.0	204.22	-8.46
1014.5	205.73	-8.51
1015.0	207.94	-8.54
1015.5	207.53	-8.58
1016.0	207.18	-8.63
1016.5	208.21	-8.66
1017.0	208.49	-8.70
1017.5	208.08	-8.74
1018.0	214.70	-8.77
1018.5	215.04	-8.82
1019.0	214.14	-8.86
1019.5	213.11	-8.89
1020.0	212.42	-8.93
1020.5	212.90	-8.97
1021.0	212.28	-9.01
1021.5	211.94	-9.05
1022.0	212.14	-9.09
1022.5	211.39	-9.13
1023.0	211.18	-9.17
1023.5	211.52	-9.20
1024.0	210.83	-9.25
1024.5	214.42	-9.29
1025.0	219.52	-9.32
1025.5	223.93	-9.37
1026.0	226.28	-9.40
1026.5	228.00	-9.44
1027.0	229.80	-9.48
1027.5	231.11	-9.51
1028.0	232.69	-9.56
1028.5	234.69	-9.59
1029.0	236.14	-9.63
1029.5	237.24	-9.67
1030.0	238.00	-9.70
1030.5	238.48	-9.74
1031.0	239.03	-9.77
1031.5	239.79	-9.81
1032.0	240.28	-9.85
1032.5	240.90	-9.89
1033.0	241.31	-9.93
1033.5	241.38	-9.96
1034.0	242.00	-10.00
1034.5	243.03	-10.04
1035.0	243.79	-10.07
1035.5	250.69	-10.11
1036.0	278.54	-10.14
1036.5	293.09	-10.18
1037.0	298.60	-10.22
1037.5	301.43	-10.24
1038.0	302.88	-10.28
1038.5	303.57	-10.32
1039.0	303.91	-10.35
1039.5	303.98	-10.39
1040.0	303.78	-10.42
1040.5	303.50	-10.45
1041.0	303.09	-10.49
1041.5	302.74	-10.52
1042.0	302.26	-10.55
1042.5	301.71	-10.59
1043.0	301.16	-10.62
1043.5	300.67	-10.65
1044.0	300.05	-10.69
1044.5	299.50	-10.72
1045.0	298.67	-10.75
1045.5	297.98	-10.78
1046.0	297.23	-10.81
1046.5	296.54	-10.84
1047.0	296.26	-10.88
1047.5	295.50	-10.91
1048.0	295.09	-10.94
1048.5	294.47	-10.97
1049.0	294.05	-11.00
1049.5	293.57	-11.03
1050.0	292.95	-11.06
1050.5	292.40	-11.09
1051.0	291.92	-11.13
1051.5	291.37	-11.15
1052.0	290.88	-11.18
1052.5	290.40	-11.21
1053.0	289.99	-11.25
1053.5	289.37	-11.27
1054.0	288.88	-11.30
1054.5	288.26	-11.33
1055.0	287.85	-11.36
1055.5	287.44	-11.39
1056.0	287.02	-11.42
1056.5	286.61	-11.45
1057.0	286.26	-11.48
1057.5	285.85	-11.50
1058.0	285.44	-11.53
1058.5	284.95	-11.56
1059.0	284.40	-11.59
1059.5	284.06	-11.62
1060.0	283.51	-11.65
1060.5	283.16	-11.68
1061.0	282.75	-11.71
1061.5	282.33	-11.73
1062.0	282.06	-11.76
1062.5	281.85	-11.79
1063.0	281.51	-11.82
1063.5	281.37	-11.84
1064.0	281.09	-11.87
1064.5	280.82	-11.90
1065.0	280.68	-11.93
1065.5	280.54	-11.95
1066.0	280.54	-11.98
1066.5	280.40	-12.00
1067.0	280.33	-12.03
1067.5	280.26	-12.06
1068.0	280.06	-12.08
1068.5	279.92	-12.11
1069.0	279.78	-12.13
1069.5	279.64	-12.15
1070.0	279.37	-12.18
1070.5	279.09	-12.21
1071.0	279.02	-12.23
1071.5	279.30	-12.26
1072.0	279.85	-12.28
1072.5	280.33	-12.30
1073.0	280.82	-12.33
1073.5	281.16	-12.35
1074.0	281.57	-12.37
1074.5	282.40	-12.40
1075.0	282.75	-12.42
1075.5	282.95	-12.45
1076.0	283.30	-12.47
1076.5	283.51	-12.50
1077.0	283.78	-12.52
1077.5	283.99	-12.54
1078.0	284.13	-12.56
1078.5	284.33	-12.58
1079.0	284.47	-12.61
1079.5	284.47	-12.63
1080.0	284.61	-12.65
1080.5	284.68	-12.68
1081.0	284.68	-12.70
1081.5	284.82	-12.72
1082.0	284.68	-12.74
1082.5	284.68	-12.77
1083.0	284.68	-12.79
1083.5	284.68	-12.81
1084.0	284.61	-12.83
1084.5	284.54	-12.85
1085.0	284.47	-12.87
1085.5	284.33	-12.90
1086.0	284.19	-12.92
1086.5	284.06	-12.94
1087.0	283.99	-12.96
1087.5	283.85	-12.98
1088.0	283.64	-13.00
1088.5	283.44	-13.02
1089.0	283.23	-13.04
1089.5	283.02	-13.06
1090.0	283.09	-13.08
1090.5	283.99	-13.10
1091.0	284.95	-13.12
1091.5	285.99	-13.13
1092.0	286.95	-13.14
1092.5	288.12	-13.15
1093.0	289.16	-13.16

CANADA OIL AND GAS LANDS
ADMINISTRATION
FEB 16 1989
CONTROL

DST #2

9211-56-2-J

Schlumberger | Schlumberger of Canada Testing Services

OTTAWA COPY

Test Date : 2/7/89
Location : 60-30 N 122-53 W
DST # : TWO

LEVEL I FLOPETROL JOHNSTON ™ DST REPORT

for

SHELL CANADA LTD.

Well: SHELL ET AL ARROWHEAD B-41

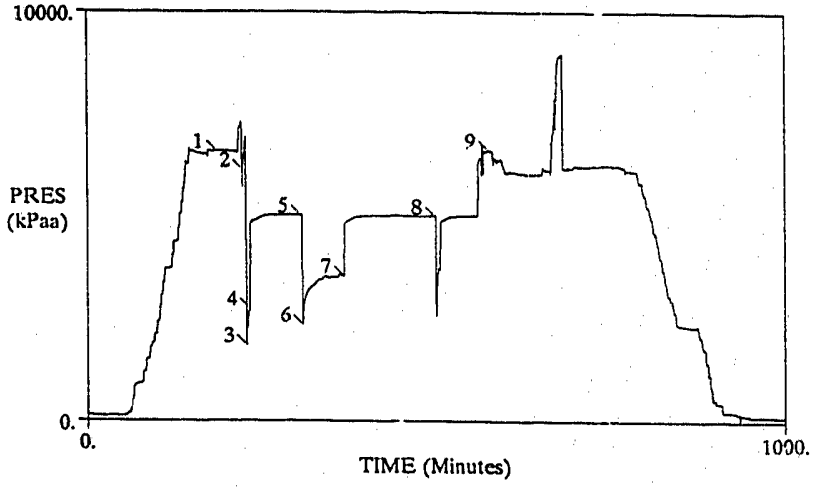
DST #TWO: BASAL QUARTZ FORMATION - (621 - 632M)

••••••••••••••••••Test Reference Number: 300277B••••••••••••••••••

Test Data

#	Explanation	P(kPa)	T(min)
1	HYDROSTATIC	6597.0	185.5
2	REFERENCE TIME	6133.9	224.0
3	START FLOW	1847.5	229.0
4	START SHUT-IN	2745.9	234.0
5	END SHUT-IN	5029.2	306.5
6	START FLOW	233(	310.0
7	START SHUT-IN	3536.5	368.5
8	END SHUT-IN	5018.5	497.5
9	HYDROSTATIC	6624.9	576.0

BOTTOMHOLE PRESSURE LOG



Test Results [INFLATE STRADDLE]

F'NAL SHUTIN PRESSURE	5018 kPa
kESERVOIR TEMPERATURE	27 C
PRODUCTION RATE	113,269 m3/day
NET PIPE RECOVERY	TEST WAS REVERSE CIRCULATED PRIOR TO PULLING TO FLUID. RECOVERY APPEARED TO BE BRACKISH FRESH WATER. 2 GAS BOMBS, 3 FLUID SAMPLES AND 2 BOTTOMHOLE SAMPLERS WERE SENT TO CHEMEX LABS IN GRANDE PRAIRIE

Blow Description

PREFLOW	STRONG AIR FLOW, GAS TO SUR' ACE IN 1 MINUTE.
MAINFLOW	STRONG GAS BLOW THROUGHOUT. MAXIMUM FLOWRATE OF 113,269 m3/day

Comments

THIS WAS A SUCCESSFUL TEST OF THE BASAL QUARTZ FORMATION FROM 621 TO 632 m. DURING THE TEST GAS DID FLOW TO SURFACE AT STABILIZED RATES OF 113,296 m3/DAY.

THE BOTTOMHOLE PRESSURE RESPONSE INDICATES A ZONE OF EXCELLENT PERMEABILITY WITH LITTLE TO NO WELLBORE DAMAGE AT THE TIME OF TESTING.

SHOULD YOU HAVE ANY QUESTIONS, PLEASE CONTACT MARCUS GREEN AT 231-9707.

Schlumberger

Schlumberger of Canada
Testing Services

Test Date : 2/7/89
Location : 60-30 N 122-53 W
DST # : TWO

Flowrate Summary and Sequence of Events

LABEL POINT #	TIME of DAY (HH:MM:SS)	EXPLANATION	DURATION (min)	BHP kPaa	BHT C	SURF PRESS kPaa	FLOW RATE (M cube/Day)
1	6:05:30	HYDROSTATIC		6597.0	28.4		
2	6:44:00	REFERENCE TIME	38.5	6133.9	30.1		
3	6:49:00	START FLOW	5.0	1847.5	30.2		
4	6:54:00	START SHUT-IN	5.0	2745.9	30.0		
5	8:06:30	END SHUT-IN	72.5	5029.2	29.5		
6	8:10:00	START FLOW 19.05 mm ORIFICE [5 MINS] 19.05 mm ORIFICE [15 MINS] 19.05 mm ORIFICE [5 MINS] 19.05 mm ORIFICE [30 MINS]	3.5	2336.6	29.6	 1600.0 1800.0 1900.0 2000.0	 96279. 107606. 110437. 113269.
7	9:08:30	START SHUT-IN	58.5	3536.5	25.6		
8	11:17:30	END SHUT-IN	129.0	5018.5	28.5		
9	12:36:00	HYDROSTATIC	78.5	6624.9	28.3		

Sample Data

Sample #/Source	Description	RESISTIVITY ohm @ C	Salinity PPM(NaCl)
1-			
2-			
3-SURFACE	2 GAS BOMBS		
4-SURFACE	3 FLUID SAMPLES		
5-BOTTOMHOLE SAMPLER	2 SAMPLES		

Samples Sent To: CHEMEX LABS

Schlumberger

Schlumberger of Canada
Testing Services

Test Date : 2/7/89
Location : 60-30 N 122-53 W
DST # : TWO

Hole Conditions

Total Depth(MD/TVD)	667 m
Hole Size	216 mm
Mud Weight	1090 kg/m3
Mud Type	GEL CHEMICAL

Test String Configuration

Pipe Length/I.D.	437.93 m / 108 mm
Collar Length/I.D.	171.54 m / 73 mm
Packer Depths	621 - 632 m
Bottomhole Choke Size	19.05 mm
Gauge Depth/Type	610.23 m / J300

Tool Sequence:

#	DESCRIPTION	LENGTH(m)	DEPTH(m)
0	DRILL PIPE TOP	0.00	-8.94
1	Drill Pipe	9.70	0.76
2	OTHER STABBING VALVE	0.45	1.21
3	Drill Pipe	427.78	428.99
4	Drill Collars	141.63	573.62
5	Pumpout Sub PIN TYPE	0.32	573.94
6	Drill Collars	8.97	582.91
7	Pumpout Sub PRESSURE TYPE	0.76	583.67
8	Drill Collars	17.94	601.61
9	OTHER BIT SUB	0.85	602.46
10	Crossover	0.22	602.68
11	Recorder AK1 2087	1.34	604.02
12	MFE [Test Valve]	3.84	607.86
13	Crossover	0.31	608.17
14	Recorder AK1 2062	1.34	609.51
15	Elec.Recorder J300 2058	2.36	611.87
16	Jars	2.34	614.21
17	Rotary Pump	2.45	616.66
18	MSRV [Deflate]	2.46	619.12
19	REFERENCE PACKER	1.88	621.00
20	Packer Stub	0.67	621.67
21	Recorder K3 17729/17730	1.84	623.51
22	Blank Anchor	7.60	631.11
23	Crossover	0.24	631.35
24	Packer Stub	0.67	632.02
25	Packer	1.88	633.90
26	DDST [Drag Spring]	2.62	636.52
27	Recorder AK1 2088	1.34	637.86
28	Blank Off Sub	0.26	638.12
29	Bullnose	0.63	638.75

Flopetrol Representative : B. HOLLINGSHEAD

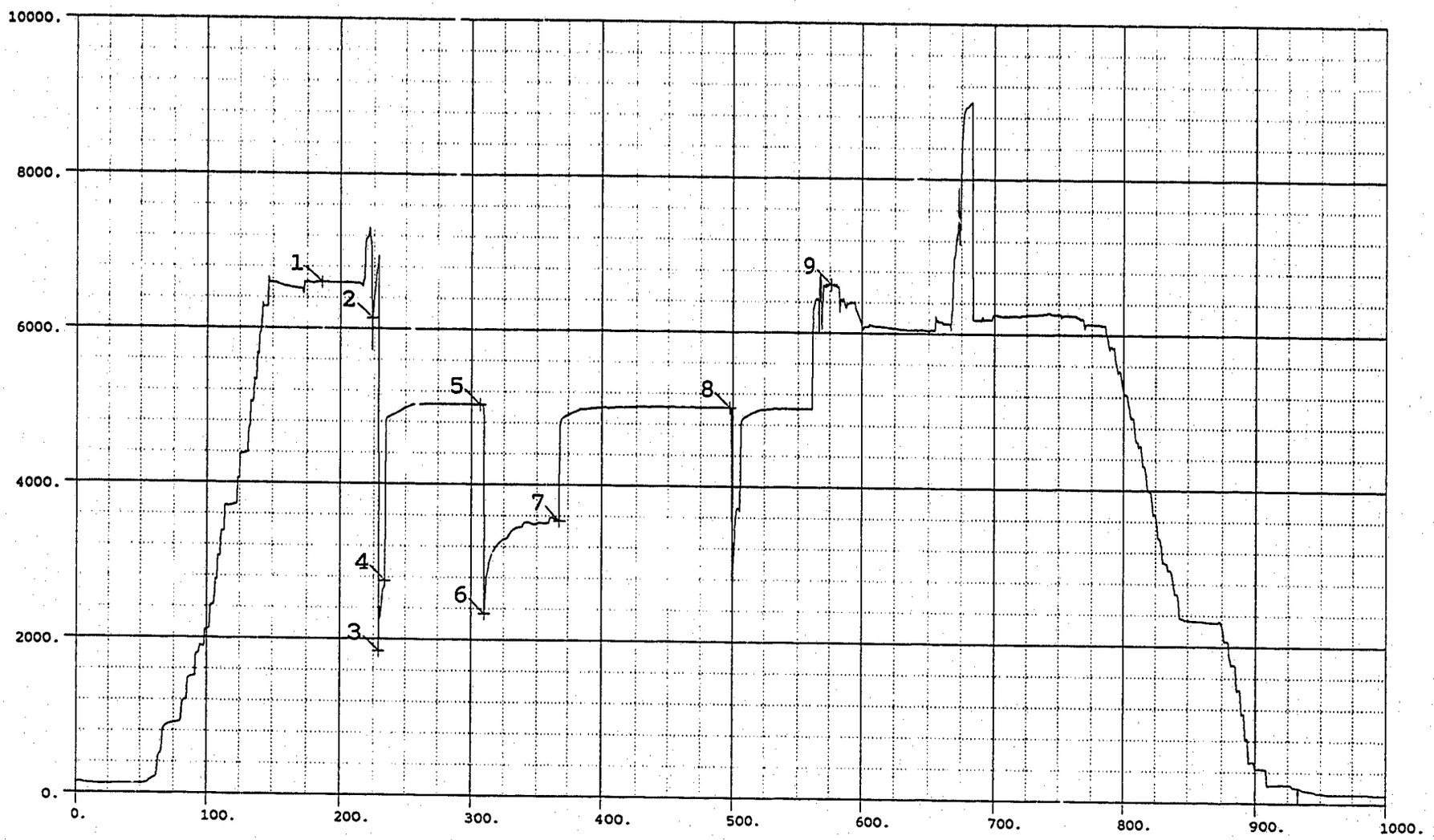
District : GRANDE PRAIRIE

Schlumberger of Canada
Schlumberger Testing Services

BOTTOMHOLE PRESSURE PLOT

FIELD REPORT NO. : 300277B
INSTRUMENT NO. : J300-2058
DEPTH : 610.23 m
CAPACITY : 68950 kPa / 150 C
PORT OPENING : INSIDE

COMPANY : SHELL CANADA LTD.
WELL : SHELL ET AL ARROWHEAD B-41
DST# : TWO



X-AXIS = ELAPSED TIME [MIN]
Y-AXIS = BOTTOMHOLE PRESSURE [KPA (ABS)]

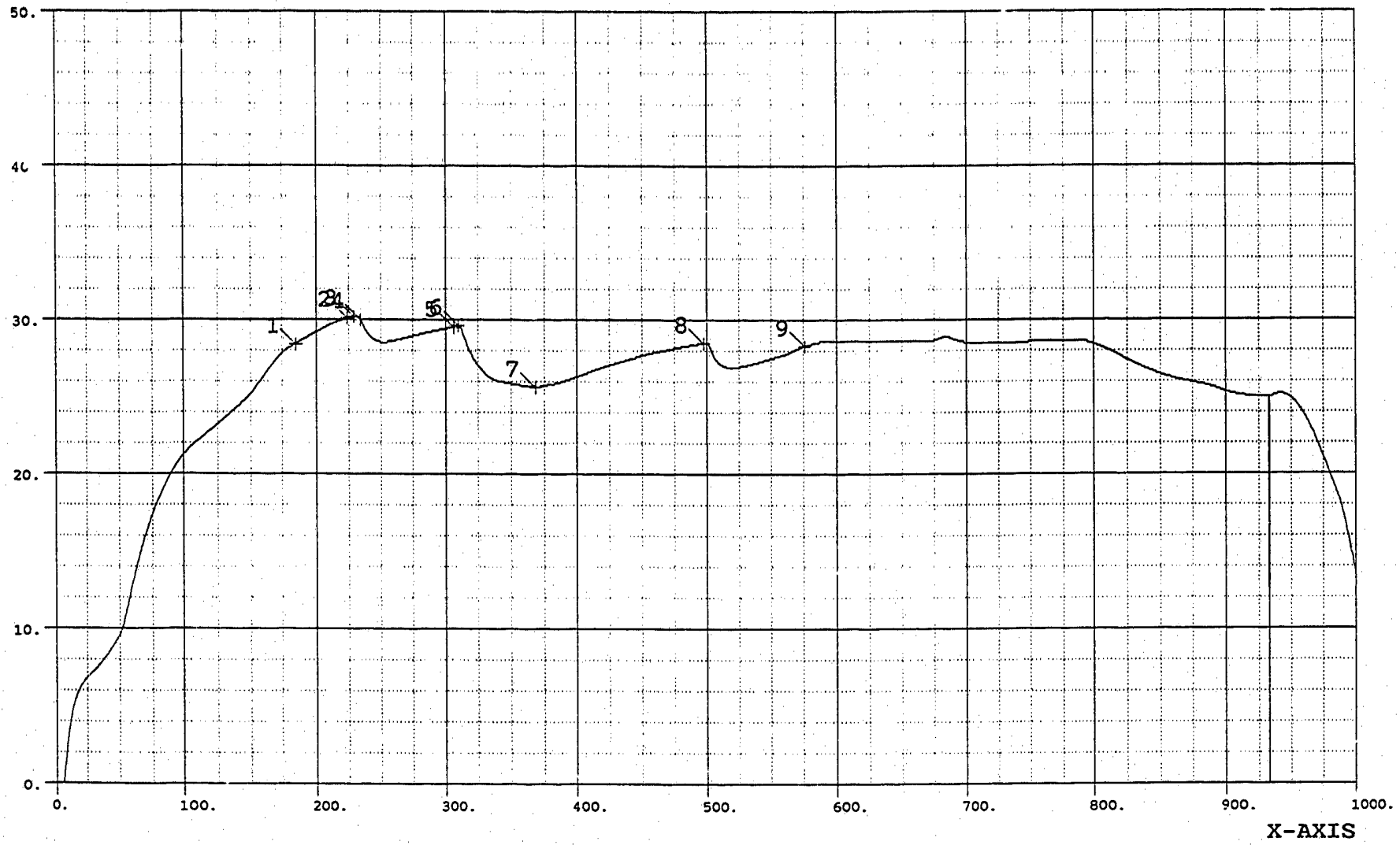
Schlumberger of Canada
Schlumberger Testing Services

BOTTOMHOLE TEMPERATURE PLOT

FIELD REPORT NO. : 300277B
INSTRUMENT NO. : J300-2058
DEPTH : 610.23 m
CAPACITY : 68950 kPa / 150 C
PORT OPENING : INSIDE

COMPANY : SHELL CANADA LTD.
WELL : SHELL ET AL ARROWHEAD B-41
DST# : TWO

Y-AXIS



X-AXIS

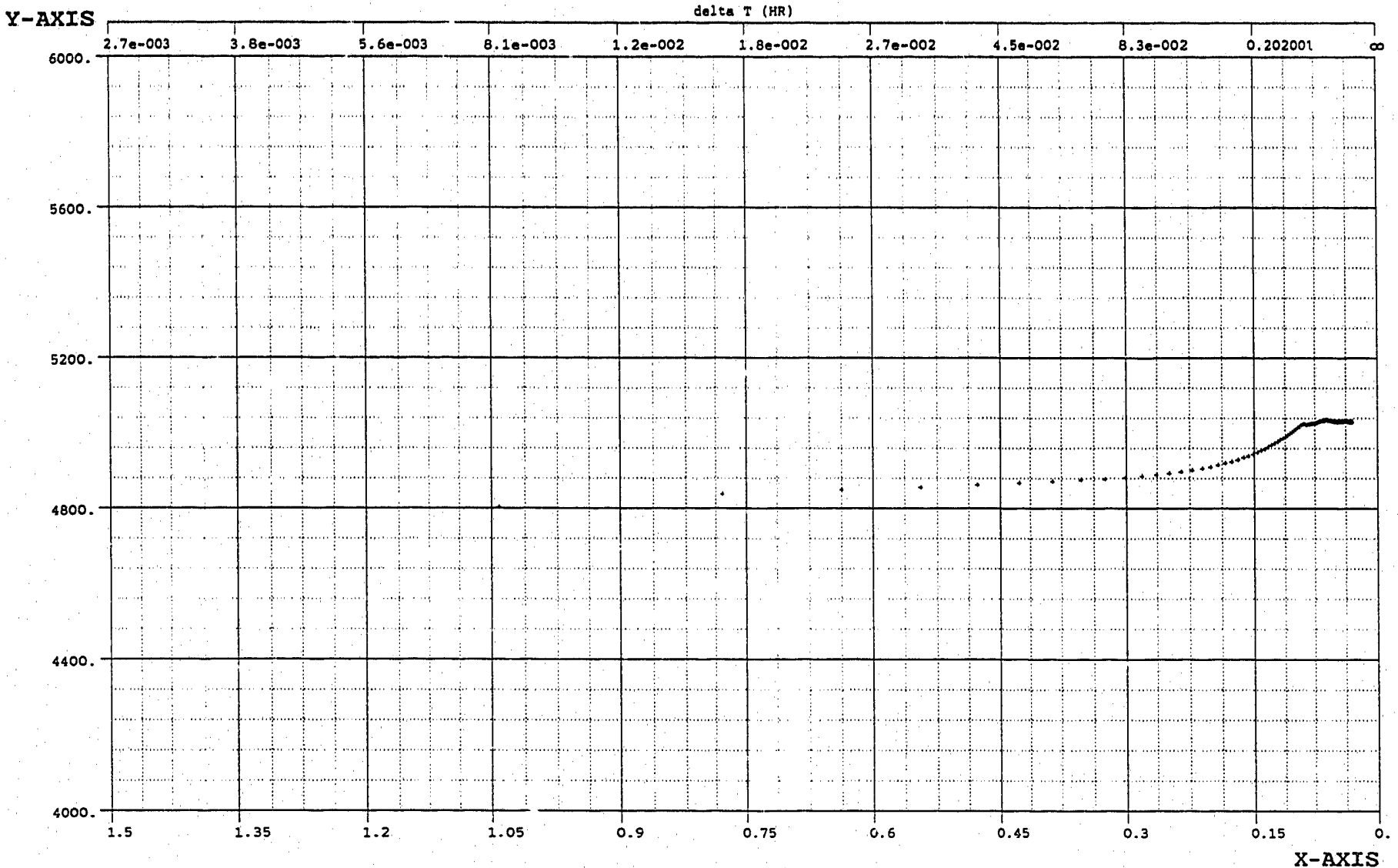
X-AXIS = ELAPSED TIME [MIN]
Y-AXIS = BOTTOMHOLE TEMPERATURE [CEL]

Schlumberger of Canada
Schlumberger Testing Services

H O R N E R P L O T

FIELD REPORT#: 300277B
INSTRUMENT#: J300-2058
ELAPSED TIME RANGE: 234. - 306.5 MIN.
Delta_T TIME RANGE: 8.3e-003 - 1.208333 HR.
PRODUCING TIME [Tp]: 8.3e-002 HR.

COMPANY: SHELL CANADA LTD.
WELL: SHELL ET AL ARROWHEAD B-41
SHUTIN#: ONE
DST#: TWO



X-AXIS = LOG [(Tp + delta T) / delta T]
Y-AXIS = SHUTIN PRESSURE [KPA (ABS)]

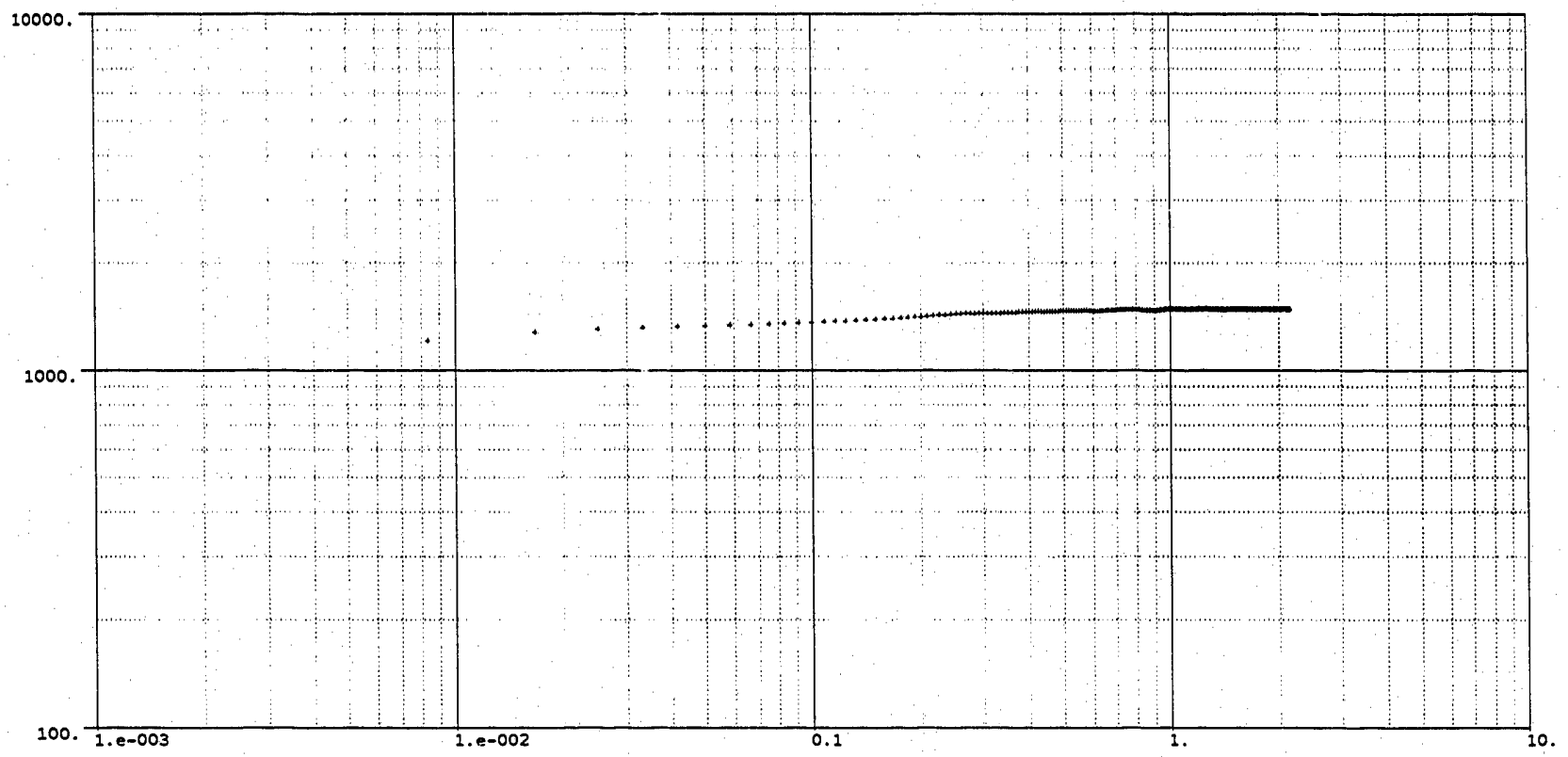
Schlumberger of Canada
Schlumberger Testing Services

L O G - L O G P L O T

FIELD REPORT#: 300277B
INSTRUMENT#: J300-2058
ELAPSED TIME RANGE: 368.5 - 497.5 MIN.
Delta_T TIME RANGE: 8.3e-003 - 2.15 HR.

COMPANY: SHELL CANADA LTD.
WELL: SHELL ET AL ARROWHEAD B-41
SHUTIN#: TWO
DST#: TWO

Y-AXIS



X-AXIS

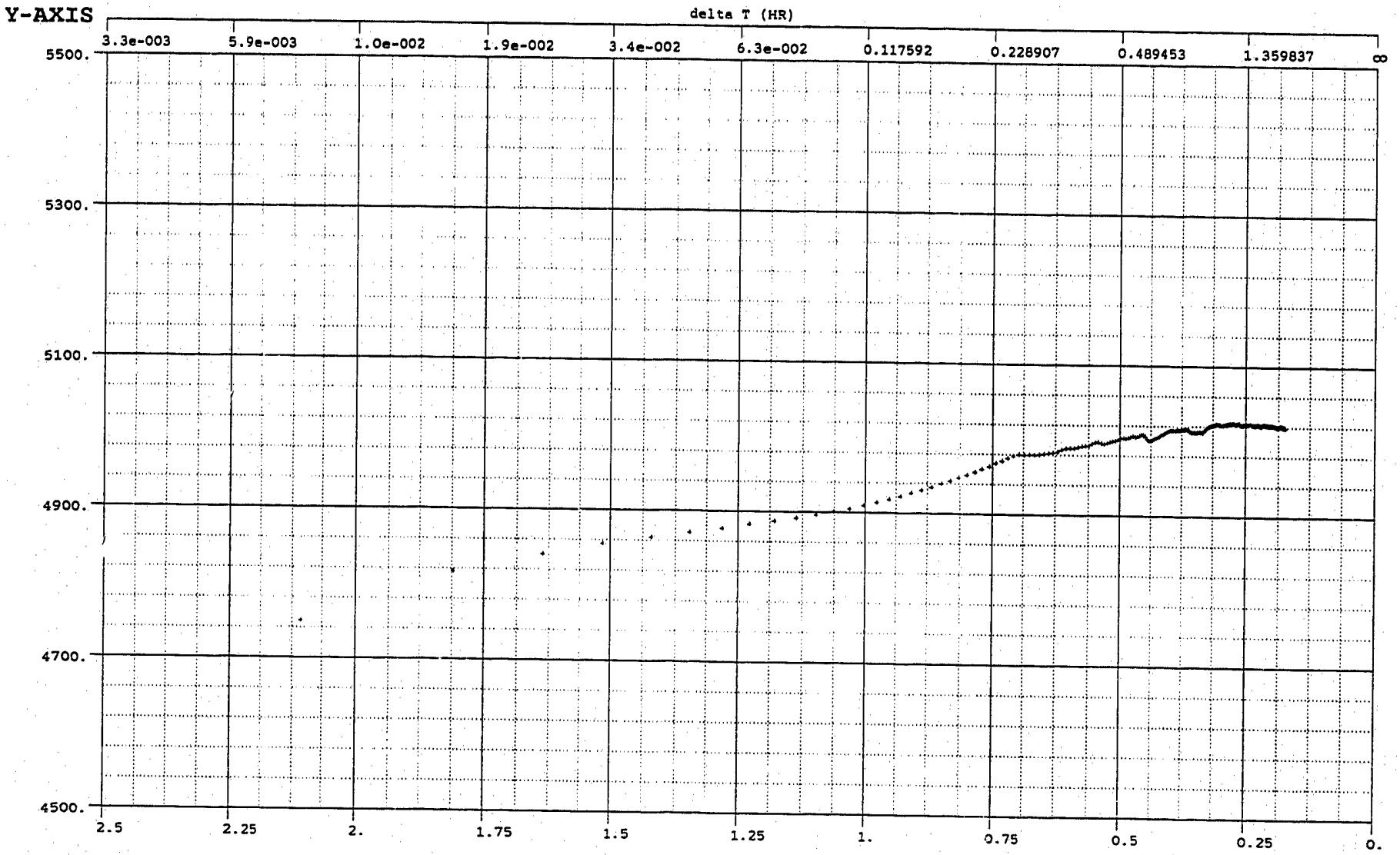
X-AXIS = delta T (HR)
Y-AXIS = delta P (KPA)

Schlumberger of Canada
Schlumberger Testing Services

HORNER PLOT

FIELD REPORT#: 300277B
INSTRUMENT#: J300-2058
ELAPSED TIME RANGE: 368.5 - 497.5 MIN.
Delta_T TIME RANGE: 8.3e-003 - 2.15 HR.
PRODUCING TIME [Tp]: 1.058333333 HR.

COMPANY: SHELL CANADA LTD.
WELL: SHELL ET AL ARROWHEAD B-41
SHUTIN#: TWO
DST#: TWO



X-AXIS = LOG [(Tp + delta T) / delta T]
Y-AXIS = SHUTIN PRESSURE [KPA (ABS)]

WELL: SHELL ET AL ARROWHEAD B-41 DST#: TWO INTERVAL: 621 - 632
TEST REFERENCE#: 300277B FILE STARTS: 3:00:00 on February 7, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T
0.0	128.79	-3.10
0.5	134.65	-3.10
1.0	139.06	-3.00
1.5	143.06	-3.00
2.0	145.54	-2.90
2.5	146.09	-2.70
3.0	145.13	-2.40
3.5	143.40	-2.00
4.0	142.03	-1.60
4.5	140.51	-1.10
5.0	138.23	-0.70
5.5	136.03	-0.20
6.0	134.23	0.16
6.5	132.99	0.57
7.0	131.68	0.99
7.5	130.30	1.40
8.0	128.93	1.78
8.5	127.55	2.14
9.0	126.31	2.48
9.5	125.06	2.81
10.0	124.17	3.13
10.5	123.41	3.40
11.0	122.79	3.66
11.5	122.10	3.91
12.0	121.41	4.14
12.5	121.00	4.35
13.0	120.51	4.55
13.5	120.03	4.73
14.0	119.69	4.90
14.5	119.34	5.06
15.0	119.07	5.20
15.5	118.79	5.34
16.0	118.51	5.47
16.5	118.31	5.58
17.0	118.17	5.70
17.5	117.96	5.80
18.0	117.76	5.90
18.5	117.69	5.98
19.0	117.55	6.07
19.5	117.48	6.15
20.0	117.48	6.23
20.5	117.96	6.30
21.0	118.10	6.37
21.5	118.24	6.43
22.0	118.24	6.50
22.5	118.17	6.55
23.0	118.10	6.61
23.5	117.96	6.66
24.0	118.24	6.71
24.5	118.51	6.76
25.0	118.72	6.81
25.5	118.93	6.86
26.0	119.00	6.90
26.5	119.20	6.94
27.0	119.27	6.98
27.5	119.55	7.03
28.0	119.62	7.06
28.5	119.76	7.11
29.0	119.89	7.15
29.5	120.03	7.19
30.0	120.17	7.23
30.5	120.17	7.28
31.0	120.38	7.32
31.5	120.38	7.36
32.0	120.51	7.41
32.5	120.58	7.45
33.0	120.58	7.50
33.5	120.65	7.55
34.0	120.58	7.60
34.5	120.72	7.65
35.0	120.72	7.70
35.5	120.86	7.75
36.0	121.00	7.80
36.5	120.93	7.85
37.0	121.00	7.91
37.5	121.07	7.96
38.0	121.13	8.02
38.5	121.20	8.07
39.0	121.34	8.13
39.5	121.34	8.18
40.0	121.41	8.25
40.5	121.41	8.30
41.0	121.48	8.36
41.5	121.48	8.43
42.0	121.48	8.48
42.5	121.48	8.55
43.0	121.41	8.61
43.5	121.48	8.68
44.0	121.48	8.74
44.5	121.48	8.81
45.0	121.48	8.87
45.5	121.48	8.94
46.0	121.48	9.01
46.5	121.48	9.07
47.0	121.41	9.15
47.5	121.48	9.21
48.0	121.55	9.28
48.5	121.41	9.35
49.0	121.48	9.42
49.5	122.17	9.49
50.0	123.20	9.57
50.5	123.75	9.66
51.0	124.24	9.77
51.5	124.51	9.90
52.0	125.48	10.00
52.5	126.72	10.20
53.0	128.86	10.30
53.5	130.37	10.50
54.0	131.48	10.70
54.5	133.06	10.90
55.0	134.44	11.10
55.5	136.37	11.30
56.0	146.99	11.40
56.5	156.78	11.60
57.0	164.85	11.80
57.5	172.50	12.00
58.0	179.12	12.20
58.5	185.19	12.40
59.0	190.98	12.60
59.5	196.43	12.80
60.0	201.66	13.00
60.5	205.80	13.10
61.0	209.39	13.30
61.5	213.32	13.50
62.0	228.28	13.70
62.5	369.07	13.80
63.0	443.39	14.00
63.5	476.42	14.20
64.0	495.45	14.30
64.5	508.48	14.50
65.0	518.96	14.60
65.5	527.92	14.80
66.0	641.89	15.00
66.5	793.09	15.10
67.0	825.70	15.30
67.5	842.25	15.40
68.0	853.77	15.60
68.5	862.87	15.70
69.0	869.62	15.90
69.5	874.86	16.00
70.0	880.10	16.10
70.5	884.59	16.30
71.0	888.31	16.40
71.5	891.41	16.50
72.0	894.03	16.70
72.5	896.17	16.80
73.0	897.89	16.90
73.5	899.55	17.10
74.0	900.72	17.20
74.5	901.68	17.30
75.0	902.65	17.40
75.5	903.61	17.50
76.0	904.65	17.60
76.5	905.68	17.80
77.0	906.79	17.90
77.5	907.96	18.00
78.0	909.20	18.10
78.5	910.92	18.20
79.0	913.61	18.30
79.5	915.61	18.40
80.0	917.68	18.50
80.5	955.81	18.50
81.0	1135.76	18.60
81.5	1167.27	18.70
82.0	1182.92	18.80
82.5	1190.85	18.90
83.0	1194.57	19.00
83.5	1197.47	19.10
84.0	1200.09	19.10
84.5	1202.98	19.20
85.0	1338.05	19.30
85.5	1471.88	19.40
86.0	1486.84	19.50
86.5	1492.84	19.50
87.0	1497.04	19.60
87.5	1500.42	19.70
88.0	1502.97	19.80
88.5	1504.69	19.80
89.0	1506.07	19.90
89.5	1507.25	20.00
90.0	1508.35	20.00
90.5	1509.38	20.10
91.0	1512.76	20.20
91.5	1758.14	20.20
92.0	1792.00	20.30
92.5	1798.27	20.40
93.0	1801.72	20.40
93.5	1803.37	20.50
94.0	1805.51	20.50
95.0	1906.52	20.70
95.5	1900.24	20.70
96.0	1896.31	20.80
96.5	1894.24	20.80
97.0	1892.80	20.90
97.5	1891.90	21.00
98.0	1923.41	21.00
98.5	2097.91	21.10
99.0	2103.36	21.10
99.5	2107.36	21.20
100.0	2110.88	21.20
100.5	2113.43	21.30
101.0	2115.84	21.30
101.5	2117.98	21.40
102.0	2122.53	21.40
102.5	2362.05	21.50
103.0	2419.35	21.50
103.5	2421.00	21.60
104.0	2423.00	21.60
104.5	2425.48	21.70
105.0	2427.27	21.70
105.5	2429.14	21.80
106.0	2578.20	21.80
106.5	2753.12	21.80
107.0	2750.98	21.90
107.5	2750.02	21.90
108.0	2936.72	22.00
108.5	3063.86	22.00
109.0	3060.07	22.10
109.5	3058.35	22.10
110.0	3057.66	22.10
110.5	3276.91	22.20
111.0	3383.84	22.20
111.5	3379.91	22.20
112.0	3377.78	22.30
112.5	3376.54	22.30
113.0	3396.05	22.40
113.5	3686.52	22.40
114.0	3712.79	22.40
114.5	3708.10	22.50
115.0	3705.55	22.50
115.5	3704.24	22.50
116.0	3703.83	22.60
116.5	3704.24	22.60
117.0	3705.14	22.70
117.5	3706.31	22.70
118.0	3707.83	22.70
118.5	3709.55	22.80
119.0	3711.48	22.80
119.5	3713.48	22.80
120.0	3715.62	22.90
120.5	3717.76	22.90
121.0	3719.89	22.90
121.5	3722.10	23.00
122.0	3724.31	23.00
122.5	3726.58	23.00
123.0	3768.02	23.10
123.5	4060.28	23.10
124.0	4055.53	23.20
124.5	4053.66	23.20
125.0	4051.94	23.20
125.5	4348.14	23.30
126.0	4379.99	23.30
126.5	4376.75	23.30
127.0	4375.58	23.40
127.5	4375.65	23.40
128.0	4376.68	23.40
128.5	4378.54	23.50
129.0	4380.89	23.50
129.5	4383.65	23.50
130.0	4386.75	23.60
130.5	4390.20	23.60
131.0	4393.85	23.60
131.5	4394.95	23.70
132.0	4632.89	23.70
132.5	4727.42	23.70
133.0	4727.35	23.80
133.5	4760.44	23.80
134.0	5058.43	23.80
134.5	5040.16	23.90
135.0	5040.23	23.90
135.5	5041.47	24.00
136.0	5113.93	24.00
136.5	5348.90	24.00
137.0	5341.53	24.10
137.5	5320.70	24.10
138.0	5332.01	24.10
138.5	5506.52	24.20
139.0	5682.40	24.20
139.5	5652.89	24.30
140.0	5655.10	24.30
140.5	5919.23	24.30
141.0	5950.40	24.40
141.5	5956.33	24.40
142.0	6042.37	24.40
142.5	6331.67	24.50
143.0	6270.79	24.50
143.5	6273.90	24.60
144.0	6274.93	24.60
144.5	6277.14	24.70
145.0	6279.41	24.70
145.5	6277.76	24.70
146.0	6276.31	24.80
146.5	6280.65	24.80
147.0	6663.24	24.90
147.5	6587.26	24.90
148.0	6590.78	25.00
148.5	6594.84	25.00
149.0	6596.50	25.10
149.5	6598.91	25.10
150.0	6599.88	25.20
150.5	6590.64	25.20
151.0	6588.78	25.30
151.5	6589.81	25.30
152.0	6590.29	25.40
152.5	6594.22	25.50
153.0	6583.05	25.50
153.5	6582.23	25.60
154.0	6577.95	25.60
154.5	6573.40	25.70
155.0	6568.99	25.80
155.5	6569.33	25.80
156.0	6564.51	25.90
156.5	6563.82	25.90
157.0	6560.16	26.00
157.5	6553.34	26.00
158.0	6549.55	26.10
158.5	6551.06	26.20
159.0	6549.89	26.20
159.5	6545.82	26.30
160.0	6543.34	26.30

WELL: SHELL ET AL ARROWHEAD B-41 DST#: TWO INTERVAL: 621 - 632
TEST REFERENCE#: 300277B FILE STARTS: 3:00:00 on February 7, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T
160.5	6542.65	26.40
161.0	6540.72	26.50
161.5	6539.69	26.50
162.0	6539.48	26.60
162.5	6538.51	26.60
163.0	6536.93	26.70
163.5	6526.66	26.70
164.0	6530.10	26.80
164.5	6526.31	26.80
165.0	6528.10	26.90
165.5	6527.14	26.90
166.0	6524.79	27.00
166.5	6523.55	27.00
167.0	6522.45	27.10
167.5	6519.62	27.10
168.0	6518.38	27.20
168.5	6517.35	27.20
169.0	6517.14	27.30
169.5	6518.31	27.30
170.0	6517.49	27.40
170.5	6516.59	27.40
171.0	6515.62	27.50
171.5	6514.80	27.50
172.0	6516.11	27.50
172.5	6445.23	27.60
173.0	6603.39	27.60
173.5	6596.64	27.70
174.0	6594.78	27.70
174.5	6586.36	27.70
175.0	6620.35	27.80
175.5	6605.39	27.80
176.0	6600.91	27.90
176.5	6596.09	27.90
177.0	6593.47	27.90
177.5	6593.47	28.00
178.0	6590.57	28.00
178.5	6586.16	28.00
179.0	6582.16	28.10
179.5	6585.12	28.10
180.0	6590.23	28.10
180.5	6592.29	28.20
181.0	6592.43	28.20
181.5	6592.91	28.20
182.0	6596.57	28.20
182.5	6598.29	28.30
183.0	6598.98	28.30
183.5	6597.74	28.30
184.0	6597.46	28.40
184.5	6593.53	28.40
185.0	6595.95	28.40
185.5	6597.05	28.40
186.0	6597.19	28.50
186.5	6597.81	28.50
187.0	6598.15	28.50
187.5	6596.50	28.60
188.0	6597.19	28.60
188.5	6597.40	28.60
189.0	6597.81	28.60
189.5	6598.15	28.70
190.0	6595.67	28.70
190.5	6595.88	28.70
191.0	6595.74	28.70
191.5	6593.95	28.80
192.0	6596.29	28.80
192.5	6593.47	28.80
193.0	6593.19	28.80
193.5	6593.81	28.90
194.0	6594.29	28.90
194.5	6594.36	28.90
195.0	6594.84	29.00
195.5	6594.91	29.00
196.0	6594.91	29.00
196.5	6595.12	29.00
197.0	6595.19	29.10
197.5	6595.12	29.10
198.0	6595.40	29.10
198.5	6594.50	29.10
199.0	6594.29	29.20
199.5	6593.95	29.20
200.0	6594.02	29.20

ET	P	T
200.5	6593.88	29.20
201.0	6594.36	29.20
201.5	6594.71	29.30
202.0	6593.88	29.30
202.5	6593.74	29.30
203.0	6593.12	29.30
203.5	6592.43	29.40
204.0	6592.02	29.40
204.5	6592.02	29.40
205.0	6592.02	29.40
205.5	6591.60	29.50
206.0	6591.26	29.50
206.5	6591.26	29.50
207.0	6591.74	29.50
207.5	6591.67	29.50
208.0	6591.54	29.60
208.5	6591.26	29.60
209.0	6590.98	29.60
209.5	6591.05	29.60
210.0	6590.64	29.60
210.5	6590.09	29.70
211.0	6590.16	29.70
211.5	6589.95	29.70
212.0	6589.88	29.70
212.5	6589.95	29.70
213.0	6589.74	29.70
213.5	6589.33	29.80
214.0	6588.98	29.80
214.5	6585.54	29.80
215.0	6579.26	29.80
215.5	6572.71	29.80
216.0	6565.61	29.80
216.5	6532.45	29.90
217.0	6616.63	29.90
217.5	6640.28	29.90
218.0	6995.77	29.90
218.5	7086.09	29.90
219.0	7162.55	29.90
219.5	7167.73	29.90
220.0	7180.96	30.00
220.5	7183.58	30.00
221.0	7251.98	30.00
221.5	7311.13	30.00
222.0	7198.75	30.00
222.5	7102.29	30.00
223.0	7013.56	30.00
223.5	5713.08	30.10
224.0	6133.93	30.10
224.5	6326.43	30.10
225.0	6403.31	30.10
225.5	6449.23	30.10
226.0	6570.85	30.10
226.5	6670.34	30.10
227.0	6732.74	30.10
227.5	6794.31	30.10
228.0	6845.81	30.20
228.5	6945.37	30.20
229.0	1847.57	30.20
229.5	2418.59	30.20
230.0	2250.29	30.20
230.5	2309.37	30.20
231.0	2428.72	30.20
231.5	2522.70	30.20
232.0	2614.19	30.20
232.5	2653.14	30.20
233.0	2653.49	30.10
233.5	2696.44	30.10
234.0	2745.95	30.00
234.5	4802.08	29.90
235.0	4837.73	29.80
235.5	4848.69	29.70
236.0	4855.31	29.60
236.5	4861.59	29.50
237.0	4867.10	29.40
237.5	4871.10	29.30
238.0	4874.89	29.30
238.5	4878.06	29.20
239.0	4881.58	29.10
239.5	4885.10	29.10
240.0	4889.03	29.00

ET	P	T
240.5	4893.03	29.00
241.0	4896.82	28.90
241.5	4900.82	28.90
242.0	4905.37	28.80
242.5	4909.99	28.80
243.0	4914.61	28.80
243.5	4919.36	28.70
244.0	4924.05	28.70
244.5	4928.88	28.70
245.0	4933.64	28.70
245.5	4938.46	28.60
246.0	4943.29	28.60
246.5	4948.18	28.60
247.0	4952.94	28.60
247.5	4957.84	28.60
248.0	4962.66	28.60
248.5	4967.49	28.60
249.0	4972.18	28.60
249.5	4976.93	28.50
250.0	4981.48	28.50
250.5	4985.90	28.50
251.0	4990.31	28.50
251.5	4994.52	28.50
252.0	4998.65	28.50
252.5	5002.65	28.50
253.0	5006.51	28.50
253.5	5010.30	28.50
254.0	5013.89	28.50
254.5	5017.41	28.50
255.0	5020.72	28.50
255.5	5023.82	28.60
256.0	5025.40	28.60
256.5	5023.61	28.60
257.0	5022.58	28.60
257.5	5022.85	28.60
258.0	5023.40	28.60
258.5	5024.09	28.60
259.0	5024.78	28.60
259.5	5025.33	28.60
260.0	5025.47	28.60
260.5	5025.54	28.60
261.0	5026.09	28.60
261.5	5027.06	28.60
262.0	5028.09	28.70
262.5	5029.75	28.70
263.0	5030.99	28.70
263.5	5031.26	28.70
264.0	5031.68	28.70
264.5	5031.75	28.70
265.0	5031.68	28.70
265.5	5032.23	28.70
266.0	5033.19	28.70
266.5	5033.95	28.70
267.0	5034.78	28.80
267.5	5035.13	28.80
268.0	5033.88	28.80
268.5	5033.95	28.80
269.0	5034.09	28.80
269.5	5034.09	28.80
270.0	5033.88	28.80
270.5	5032.57	28.80
271.0	5032.57	28.80
271.5	5033.06	28.90
272.0	5032.09	28.90
272.5	5031.13	28.90
273.0	5031.13	28.90
273.5	5031.47	28.90
274.0	5031.61	28.90
274.5	5031.40	28.90
275.0	5030.71	28.90
275.5	5030.57	29.00
276.0	5030.71	29.00
276.5	5030.30	29.00
277.0	5030.16	29.00
277.5	5030.02	29.00
278.0	5030.16	29.00
278.5	5030.99	29.00
279.0	5031.82	29.00
279.5	5032.09	29.00
280.0	5032.16	29.00

ET	P	T
280.5	5032.02	29.10
281.0	5030.99	29.10
281.5	5030.57	29.10
282.0	5030.71	29.10
282.5	5030.57	29.10
283.0	5030.78	29.10
283.5	5031.13	29.10
284.0	5031.06	29.10
284.5	5031.13	29.10
285.0	5031.33	29.20
285.5	5031.40	29.20
286.0	5031.61	29.20
286.5	5031.68	29.20
287.0	5031.82	29.20
287.5	5031.75	29.20
288.0	5031.75	29.20
288.5	5031.82	29.20
289.0	5031.95	29.20
289.5	5032.02	29.20
290.0	5032.16	29.30
290.5	5032.57	29.30
291.0	5032.37	29.30
291.5	5031.75	29.30
292.0	5031.13	29.30
292.5	5030.99	29.30
293.0	5030.85	29.30
293.5	5030.99	29.30
294.0	5030.85	29.30
294.5	5030.57	29.30
295.0	5029.82	29.30
295.5	5029.47	29.40
296.0	5029.20	29.40
296.5	5029.06	29.40
297.0	5028.99	29.40
297.5	5029.06	29.40
298.0	5029.13	29.40
298.5	5029.54	29.40
299.0	5029.89	29.40
299.5	5030.16	29.40
300.0	5030.23	29.40
300.5	5030.16	29.40
301.0	5030.30	29.40
301.5	5030.44	29.50
302.0	5030.23	29.50
302.5	5030.02	29.50
303.0	5029.82	29.50
303.5	5029.82	29.50
304.0	5028.85	29.50
304.5	5029.40	29.50
305.0	5029.75	29.50
305.5	5029.82	29.50
306.0	5029.68	29.50
306.5	5029.20	29.50
307.0	5028.92	29.60
307.5	5028.99	29.60
308.0	5028.99	29.60
308.5	5029.26	29.60
309.0	5029.06	29.60
309.5	4863.31	29.60
310.0	2336.61	29.60
310.5	2465.33	29.60
311.0	2635.49	29.60
311.5	2758.56	29.50
312.0	2828.27	29.50
312.5	2880.32	29.40
313.0	2908.59	29.30
313.5	2966.65	29.10
314.0	3004.71	29.00
314.5	3039.80	28.90
315.0	3057.93	28.80
315.5	3081.86	28.70
316.0	3099.58	28.60
316.5	3123.78	28.40
317.0	3137.57	28.30
317.5	3153.91	28.20
318.0	3167.70	28.10
318.5	3181.97	28.00
319.0	3192.17	27.90
319.5	3203.48	27.90
320.0	3214.37	27.80

WELL: SHELL ET AL ARROWHEAD B-41 DST#: TWO INTERVAL: 621 - 632
TEST REFERENCE#: 300277B FILE STARTS: 3:00:00 on February 7, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T
320.5	3228.09	27.70
321.0	3237.19	27.60
321.5	3246.99	27.50
322.0	3256.91	27.40
322.5	3265.53	27.40
323.0	3272.29	27.30
323.5	3278.22	27.20
324.0	3283.87	27.20
324.5	3289.18	27.10
325.0	3293.59	27.00
325.5	3296.56	27.00
326.0	3301.73	26.90
326.5	3304.14	26.90
327.0	3305.73	26.80
327.5	3312.14	26.80
328.0	3322.83	26.70
328.5	3338.06	26.70
329.0	3355.78	26.60
329.5	3368.68	26.60
330.0	3381.29	26.50
330.5	3394.60	26.50
331.0	3406.67	26.40
331.5	3413.91	26.40
332.0	3421.56	26.40
332.5	3426.45	26.30
333.0	3431.07	26.30
333.5	3434.93	26.30
334.0	3438.66	26.30
334.5	3441.42	26.20
335.0	3443.76	26.20
335.5	3445.83	26.20
336.0	3447.35	26.20
336.5	3449.00	26.10
337.0	3449.21	26.10
337.5	3450.59	26.10
338.0	3452.24	26.10
338.5	3453.83	26.10
339.0	3474.10	26.10
339.5	3497.06	26.00
340.0	3505.61	26.00
340.5	3510.91	26.00
341.0	3514.22	26.00
341.5	3516.29	26.00
342.0	3516.57	26.00
342.5	3516.02	26.00
343.0	3514.64	26.00
343.5	3512.29	26.00
344.0	3509.54	26.00
344.5	3506.57	25.90
345.0	3503.05	25.90
345.5	3499.61	25.90
346.0	3496.44	25.90
346.5	3493.13	25.90
347.0	3492.64	25.90
347.5	3491.95	25.90
348.0	3490.99	25.90
348.5	3490.02	25.90
349.0	3489.61	25.90
349.5	3494.02	25.90
350.0	3500.50	25.80
350.5	3503.33	25.80
351.0	3506.92	25.80
351.5	3509.12	25.80
352.0	3510.02	25.80
352.5	3510.36	25.80
353.0	3509.60	25.80
353.5	3508.43	25.80
354.0	3506.98	25.80
354.5	3506.09	25.80
355.0	3505.05	25.80
355.5	3504.23	25.80
356.0	3503.40	25.80
356.5	3502.92	25.80
357.0	3502.50	25.70
357.5	3502.50	25.70
358.0	3504.50	25.70
358.5	3507.60	25.70
359.0	3509.54	25.70
359.5	3510.78	25.70
360.0	3512.02	25.70
360.5	3555.94	25.70
361.0	3571.93	25.70
361.5	3578.00	25.70
362.0	3580.76	25.70
362.5	3581.24	25.70
363.0	3578.48	25.70
363.5	3574.76	25.70
364.0	3570.62	25.70
364.5	3565.86	25.70
365.0	3560.76	25.70
365.5	3555.52	25.70
366.0	3550.63	25.70
366.5	3545.87	25.70
367.0	3542.01	25.70
367.5	3540.35	25.70
368.0	3537.87	25.70
368.5	3536.56	25.60
369.0	4748.93	25.60
369.5	4815.87	25.60
370.0	4840.28	25.60
370.5	4854.62	25.60
371.0	4864.00	25.60
371.5	4870.96	25.60
372.0	4876.96	25.70
372.5	4882.27	25.70
373.0	4887.10	25.70
373.5	4891.65	25.70
374.0	4896.06	25.70
374.5	4900.40	25.70
375.0	4904.75	25.70
375.5	4909.09	25.70
376.0	4913.37	25.70
376.5	4917.71	25.70
377.0	4921.98	25.70
377.5	4926.33	25.80
378.0	4930.60	25.80
378.5	4934.95	25.80
379.0	4939.08	25.80
379.5	4943.29	25.80
380.0	4947.42	25.80
380.5	4951.42	25.80
381.0	4955.49	25.80
381.5	4959.49	25.80
382.0	4963.49	25.80
382.5	4967.42	25.80
383.0	4971.28	25.90
383.5	4975.00	25.90
384.0	4978.04	25.90
384.5	4980.04	25.90
385.0	4979.35	25.90
385.5	4979.07	25.90
386.0	4979.42	25.90
386.5	4980.24	25.90
387.0	4981.07	25.90
387.5	4981.76	26.00
388.0	4982.79	26.00
388.5	4983.90	26.00
389.0	4986.66	26.00
389.5	4988.38	26.00
390.0	4989.14	26.00
390.5	4989.21	26.00
391.0	4990.45	26.10
391.5	4991.55	26.10
392.0	4992.38	26.10
392.5	4992.38	26.10
393.0	4994.65	26.10
393.5	4996.86	26.10
394.0	4997.96	26.10
394.5	4995.96	26.10
395.0	4995.00	26.20
395.5	4996.03	26.20
396.0	4997.48	26.20
396.5	4998.45	26.20
397.0	4999.41	26.20
397.5	5000.86	26.20
398.0	5002.72	26.20
398.5	5003.48	26.30
399.0	5002.79	26.30
399.5	5003.48	26.30
400.0	5004.79	26.30
400.5	5005.55	26.30
401.0	5004.51	26.30
401.5	5004.51	26.30
402.0	5006.51	26.40
402.5	5007.55	26.40
403.0	5008.03	26.40
403.5	5005.75	26.40
404.0	5002.79	26.40
404.5	5000.24	26.40
405.0	4999.82	26.50
405.5	5001.07	26.50
406.0	5002.31	26.50
406.5	5004.10	26.50
407.0	5004.44	26.50
407.5	5006.10	26.50
408.0	5007.89	26.50
408.5	5008.58	26.60
409.0	5009.48	26.60
409.5	5011.13	26.60
410.0	5012.17	26.60
410.5	5013.34	26.60
411.0	5014.44	26.60
411.5	5014.37	26.70
412.0	5014.03	26.70
412.5	5014.03	26.70
413.0	5014.72	26.70
413.5	5014.92	26.70
414.0	5014.99	26.70
414.5	5014.86	26.80
415.0	5014.92	26.80
415.5	5015.20	26.80
416.0	5015.54	26.80
416.5	5015.82	26.80
417.0	5015.68	26.80
417.5	5014.65	26.80
418.0	5012.65	26.80
418.5	5011.68	26.90
419.0	5011.48	26.90
419.5	5011.48	26.90
420.0	5011.34	26.90
420.5	5011.27	26.90
421.0	5011.55	26.90
421.5	5012.10	27.00
422.0	5012.24	27.00
422.5	5011.96	27.00
423.0	5011.75	27.00
423.5	5011.61	27.00
424.0	5011.68	27.00
424.5	5013.75	27.00
425.0	5015.75	27.10
425.5	5017.20	27.10
426.0	5018.44	27.10
426.5	5019.41	27.10
427.0	5020.16	27.10
427.5	5020.78	27.10
428.0	5021.20	27.10
428.5	5021.61	27.10
429.0	5021.96	27.20
429.5	5022.03	27.20
430.0	5022.44	27.20
430.5	5023.20	27.20
431.0	5022.99	27.20
431.5	5023.06	27.20
432.0	5022.72	27.20
432.5	5022.58	27.30
433.0	5022.23	27.30
433.5	5021.27	27.30
434.0	5021.41	27.30
434.5	5021.96	27.30
435.0	5022.23	27.30
435.5	5022.37	27.30
436.0	5022.51	27.30
436.5	5022.78	27.40
437.0	5022.99	27.40
437.5	5023.20	27.40
438.0	5023.54	27.40
438.5	5023.75	27.40
439.0	5023.89	27.40
439.5	5023.96	27.40
440.0	5023.75	27.40
440.5	5023.96	27.50
441.0	5024.51	27.50
441.5	5024.65	27.50
442.0	5023.82	27.50
442.5	5023.20	27.50
443.0	5023.47	27.50
443.5	5023.68	27.50
444.0	5024.23	27.50
444.5	5024.30	27.50
445.0	5024.44	27.60
445.5	5023.75	27.60
446.0	5022.85	27.60
446.5	5022.09	27.60
447.0	5022.03	27.60
447.5	5022.30	27.60
448.0	5022.16	27.60
448.5	5022.30	27.60
449.0	5022.37	27.70
449.5	5022.44	27.70
450.0	5022.58	27.70
450.5	5022.65	27.70
451.0	5022.58	27.70
451.5	5022.58	27.70
452.0	5022.65	27.70
452.5	5022.58	27.70
453.0	5022.65	27.70
453.5	5023.06	27.80
454.0	5022.99	27.80
454.5	5023.06	27.80
455.0	5022.51	27.80
455.5	5021.96	27.80
456.0	5021.68	27.80
456.5	5021.68	27.80
457.0	5021.75	27.80
457.5	5021.68	27.80
458.0	5021.47	27.80
458.5	5021.54	27.90
459.0	5021.47	27.90
459.5	5021.89	27.90
460.0	5022.44	27.90
460.5	5022.65	27.90
461.0	5022.92	27.90
461.5	5022.16	27.90
462.0	5022.03	27.90
462.5	5021.68	27.90
463.0	5021.41	27.90
463.5	5021.34	27.90
464.0	5020.65	28.00
464.5	5021.47	28.00
465.0	5022.03	28.00
465.5	5022.16	28.00
466.0	5022.37	28.00
466.5	5022.51	28.00
467.0	5022.72	28.00
467.5	5022.65	28.00
468.0	5023.13	28.00
468.5	5022.51	28.00
469.0	5022.23	28.10
469.5	5022.78	28.10
470.0	5022.30	28.10
470.5	5022.23	28.10
471.0	5022.37	28.10
471.5	5022.09	28.10
472.0	5021.89	28.10
472.5	5021.54	28.10
473.0	5021.89	28.10
473.5	5021.41	28.10
474.0	5021.68	28.10
474.5	5021.54	28.20
475.0	5022.09	28.20
475.5	5022.09	28.20
476.0	5022.03	28.20
476.5	5021.96	28.20
477.0	5021.89	28.20
477.5	5021.75	28.20
478.0	5021.61	28.20
478.5	5021.06	28.20
479.0	5021.13	28.20
479.5	5021.06	28.20
480.0	5021.34	28.20

WELL: SHELL ET AL ARROWHEAD B-41 DST#: TWO INTERVAL: 621 - 632
TEST REFERENCE#: 300277B FILE STARTS: 3:00:00 on February 7, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T
480.5	5020.99	28.30
481.0	5020.51	28.30
481.5	5020.51	28.30
482.0	5020.23	28.30
482.5	5019.96	28.30
483.0	5020.30	28.30
483.5	5019.96	28.30
484.0	5019.27	28.30
484.5	5019.75	28.30
485.0	5019.41	28.30
485.5	5018.85	28.30
486.0	5019.34	28.30
486.5	5019.75	28.30
487.0	5020.03	28.40
487.5	5020.30	28.40
488.0	5020.51	28.40
488.5	5020.72	28.40
489.0	5020.85	28.40
489.5	5020.99	28.40
490.0	5020.92	28.40
490.5	5020.72	28.40
491.0	5020.58	28.40
491.5	5020.92	28.40
492.0	5020.44	28.40
492.5	5019.47	28.40
493.0	5019.06	28.40
493.5	5018.79	28.50
494.0	5019.61	28.50
494.5	5020.10	28.50
495.0	5019.89	28.50
495.5	5019.20	28.50
496.0	5018.99	28.50
496.5	5018.51	28.50
497.0	5018.16	28.50
497.5	5018.58	28.50
498.0	5018.44	28.50
498.5	5018.03	28.50
499.0	5018.58	28.50
499.5	3062.97	28.50
500.0	2559.86	28.50
500.5	2973.47	28.50
501.0	3150.18	28.50
501.5	3438.80	28.40
502.0	3568.42	28.30
502.5	3663.01	28.20
503.0	3716.17	28.10
503.5	3725.75	28.00
504.0	3725.48	27.90
504.5	3716.45	27.80
505.0	3700.52	27.70
505.5	3679.77	27.60
506.0	4774.85	27.50
506.5	4837.94	27.50
507.0	4860.62	27.40
507.5	4873.86	27.40
508.0	4882.61	27.30
508.5	4889.16	27.30
509.0	4894.82	27.20
509.5	4899.64	27.20
510.0	4904.13	27.20
510.5	4908.40	27.10
511.0	4912.54	27.10
511.5	4916.88	27.10
512.0	4921.29	27.10
512.5	4925.84	27.00
513.0	4930.26	27.00
513.5	4934.81	27.00
514.0	4939.22	27.00
514.5	4943.56	27.00
515.0	4947.91	27.00
515.5	4952.11	26.90
516.0	4956.25	26.90
516.5	4960.32	26.90
517.0	4964.25	26.90
517.5	4968.11	26.90
518.0	4971.90	26.90
518.5	4975.69	26.90
519.0	4979.28	26.90
519.5	4982.79	26.90
520.0	4986.38	26.90
520.5	4989.97	26.90
521.0	4993.21	26.90
521.5	4996.24	26.90
522.0	4998.58	26.90
522.5	4999.20	26.90
523.0	4999.55	26.90
523.5	4999.34	26.90
524.0	4999.20	26.90
524.5	4999.82	26.90
525.0	5001.76	26.90
525.5	5001.55	26.90
526.0	5001.13	27.00
526.5	5003.07	27.00
527.0	5004.58	27.00
527.5	5004.58	27.00
528.0	5004.93	27.00
528.5	5004.79	27.00
529.0	5004.93	27.00
529.5	5006.37	27.00
530.0	5006.93	27.00
530.5	5007.75	27.00
531.0	5008.51	27.00
531.5	5009.96	27.10
532.0	5010.65	27.10
532.5	5011.61	27.10
533.0	5011.13	27.10
533.5	5010.30	27.10
534.0	5009.75	27.10
534.5	5009.75	27.10
535.0	5009.34	27.10
535.5	5009.27	27.10
536.0	5008.72	27.20
536.5	5009.13	27.20
537.0	5009.48	27.20
537.5	5010.37	27.20
538.0	5011.68	27.20
538.5	5012.24	27.20
539.0	5012.58	27.20
539.5	5011.75	27.20
540.0	5013.20	27.20
540.5	5013.13	27.30
541.0	5012.30	27.30
541.5	5013.48	27.30
542.0	5013.75	27.30
542.5	5013.89	27.30
543.0	5013.20	27.30
543.5	5013.89	27.30
544.0	5014.72	27.30
544.5	5015.27	27.40
545.0	5014.30	27.40
545.5	5013.68	27.40
546.0	5012.30	27.40
546.5	5011.41	27.40
547.0	5010.99	27.40
547.5	5010.86	27.40
548.0	5010.65	27.40
548.5	5010.58	27.40
549.0	5010.65	27.50
549.5	5010.72	27.50
550.0	5010.72	27.50
550.5	5010.65	27.50
551.0	5010.65	27.50
551.5	5010.51	27.50
552.0	5010.65	27.50
552.5	5010.93	27.50
553.0	5011.27	27.60
553.5	5011.55	27.60
554.0	5011.82	27.60
554.5	5011.96	27.60
555.0	5012.10	27.60
555.5	5011.34	27.60
556.0	5010.17	27.60
556.5	5009.96	27.60
557.0	5009.89	27.60
557.5	5009.68	27.70
558.0	5009.89	27.70
558.5	5009.82	27.70
559.0	5010.30	27.70
559.5	5010.17	27.70
560.0	5009.75	27.70
560.5	5009.48	27.70
561.0	5009.75	27.70
561.5	5823.19	27.80
562.0	6299.89	27.80
562.5	6344.29	27.80
563.0	6374.28	27.80
563.5	6405.24	27.80
564.0	6427.10	27.80
564.5	6443.99	27.90
565.0	6427.44	27.90
565.5	6419.93	27.90
566.0	6460.47	27.90
566.5	6000.52	28.00
567.0	6636.49	28.00
567.5	6764.18	28.00
568.0	6631.39	28.00
568.5	6153.86	28.00
569.0	6052.30	28.10
569.5	6430.47	28.10
570.0	6617.05	28.10
570.5	6607.05	28.10
571.0	6601.26	28.10
571.5	6598.36	28.20
572.0	6595.19	28.20
572.5	6598.84	28.20
573.0	6604.01	28.20
573.5	6609.12	28.20
574.0	6614.63	28.20
574.5	6620.77	28.30
575.0	6626.42	28.30
575.5	6628.63	28.30
576.0	6624.97	28.30
576.5	6621.46	28.30
577.0	6618.36	28.30
577.5	6615.74	28.40
578.0	6613.12	28.40
578.5	6610.56	28.40
579.0	6607.88	28.40
579.5	6604.43	28.40
580.0	6601.53	28.40
580.5	6598.50	28.40
581.0	6595.47	28.40
581.5	6592.29	28.50
582.0	6578.57	28.50
582.5	6272.86	28.50
583.0	6399.31	28.50
583.5	6445.44	28.50
584.0	6432.68	28.50
584.5	6399.38	28.50
585.0	6442.68	28.50
585.5	6450.54	28.50
586.0	6394.69	28.50
586.5	6381.18	28.50
587.0	6345.88	28.50
587.5	6322.71	28.60
588.0	6365.25	28.60
588.5	6380.83	28.60
589.0	6382.97	28.60
589.5	6383.87	28.60
590.0	6386.35	28.60
590.5	6388.07	28.60
591.0	6390.14	28.60
591.5	6392.00	28.60
592.0	6393.59	28.60
592.5	6394.76	28.60
593.0	6395.11	28.60
593.5	6395.17	28.60
594.0	6394.90	28.60
594.5	6394.35	28.60
595.0	6313.54	28.60
595.5	6300.79	28.60
596.0	6279.96	28.60
596.5	6265.90	28.60
597.0	6240.32	28.60
597.5	6215.77	28.60
598.0	6190.61	28.60
598.5	6173.16	28.60
599.0	6152.14	28.60
599.5	6123.87	28.60
600.0	6091.81	28.60
600.5	6072.02	28.60
601.0	6039.96	28.60
601.5	6083.33	28.60
602.0	6083.53	28.60
602.5	6085.19	28.60
603.0	6086.15	28.60
603.5	6085.12	28.60
604.0	6084.15	28.60
604.5	6083.26	28.60
605.0	6082.98	28.60
605.5	6086.50	28.60
606.0	6117.46	28.60
606.5	6109.32	28.60
607.0	6103.60	28.60
607.5	6100.01	28.60
608.0	6097.39	28.60
608.5	6095.39	28.60
609.0	6093.81	28.60
609.5	6093.12	28.60
610.0	6093.46	28.60
610.5	6093.32	28.60
611.0	6092.98	28.60
611.5	6092.57	28.60
612.0	6091.74	28.60
612.5	6091.19	28.60
613.0	6090.43	28.60
613.5	6089.67	28.60
614.0	6088.77	28.60
614.5	6087.88	28.60
615.0	6086.98	28.60
615.5	6085.81	28.60
616.0	6084.22	28.60
616.5	6082.64	28.60
617.0	6081.19	28.60
617.5	6079.60	28.60
618.0	6077.74	28.60
618.5	6076.36	28.60
619.0	6075.05	28.60
619.5	6073.67	28.60
620.0	6072.64	28.60
620.5	6071.67	28.60
621.0	6070.71	28.60
621.5	6069.81	28.60
622.0	6068.78	28.60
622.5	6067.88	28.60
623.0	6066.85	28.60
623.5	6065.95	28.60
624.0	6064.99	28.60
624.5	6064.09	28.60
625.0	6063.13	28.60
625.5	6062.09	28.60
626.0	6061.06	28.60
626.5	6059.20	28.60
627.0	6057.54	28.60
627.5	6056.30	28.60
628.0	6055.20	28.60
628.5	6054.37	28.60
629.0	6053.96	28.60
629.5	6053.68	28.60
630.0	6052.99	28.60
630.5	6051.89	28.60
631.0	6050.78	28.60
631.5	6050.03	28.60
632.0	6049.34	28.60
632.5	6048.85	28.60
633.0	6048.44	28.60
633.5	6048.23	28.60
634.0	6048.03	28.60
634.5	6047.89	28.60
635.0	6048.03	28.60
635.5	6048.09	28.60
636.0	6048.03	28.60
636.5	6047.89	28.60
637.0	6047.82	28.60
637.5	6047.75	28.60
638.0	6047.75	28.60
638.5	6047.61	28.60
639.0	6047.41	28.60
639.5	6047.13	28.60
640.0	6046.78	28.60

WELL: SHELL ET AL ARROWHEAD B-41 DST#: TWO INTERVAL: 621 - 632
TEST REFERENCE#: 300277B FILE STARTS: 3:00:00 on February 7, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T	ET	P	T	ET	P	T	ET	P	T
640.5	6046.10	28.60	680.5	8949.59	28.80	720.5	6235.08	28.50	760.5	6245.28	28.60
641.0	6045.20	28.60	681.0	8959.18	28.80	721.0	6244.46	28.50	761.0	6245.83	28.60
641.5	6029.82	28.60	681.5	8968.55	28.90	721.5	6244.04	28.50	761.5	6245.90	28.60
642.0	6041.68	28.60	682.0	8980.13	28.90	722.0	6243.97	28.50	762.0	6245.83	28.60
642.5	6042.58	28.60	682.5	8985.86	28.90	722.5	6243.90	28.50	762.5	6245.77	28.60
643.0	6042.65	28.60	683.0	8993.92	28.90	723.0	6243.90	28.50	763.0	6245.77	28.60
643.5	6042.65	28.60	683.5	7292.52	28.90	723.5	6243.84	28.50	763.5	6235.98	28.60
644.0	6042.72	28.60	684.0	6189.51	28.90	724.0	6243.90	28.50	764.0	6222.88	28.60
644.5	6042.65	28.60	684.5	6181.23	28.90	724.5	6243.90	28.50	764.5	6222.88	28.60
645.0	6042.65	28.60	685.0	6178.13	28.90	725.0	6243.84	28.50	765.0	6223.29	28.60
645.5	6042.58	28.60	685.5	6180.61	28.90	725.5	6243.84	28.50	765.5	6223.36	28.60
646.0	6042.51	28.60	686.0	6183.16	28.90	726.0	6251.01	28.50	766.0	6202.88	28.60
646.5	6042.44	28.60	686.5	6177.65	28.90	726.5	6249.83	28.50	766.5	6206.53	28.60
647.0	6041.48	28.60	687.0	6178.75	28.80	727.0	6249.97	28.50	767.0	6208.60	28.60
647.5	6040.51	28.60	687.5	6179.23	28.80	727.5	6249.97	28.50	767.5	6209.02	28.60
648.0	6040.03	28.60	688.0	6179.71	28.80	728.0	6249.97	28.50	768.0	6208.81	28.60
648.5	6039.82	28.60	688.5	6179.65	28.80	728.5	6250.04	28.50	768.5	6208.67	28.60
649.0	6038.99	28.60	689.0	6178.40	28.80	729.0	6250.04	28.50	769.0	6158.62	28.60
649.5	6038.17	28.60	689.5	6165.17	28.70	729.5	6250.04	28.50	769.5	6075.40	28.60
650.0	6037.89	28.60	690.0	6174.61	28.70	730.0	6250.11	28.50	770.0	6135.86	28.60
650.5	6037.75	28.60	690.5	6177.09	28.70	730.5	6252.94	28.50	770.5	6136.35	28.60
651.0	6041.48	28.60	691.0	6223.84	28.70	731.0	6252.59	28.50	771.0	6136.14	28.60
651.5	6048.99	28.60	691.5	6179.30	28.70	731.5	6252.66	28.50	771.5	6137.04	28.60
652.0	6047.89	28.60	692.0	6181.23	28.70	732.0	6252.73	28.50	772.0	6137.59	28.60
652.5	6047.27	28.60	692.5	6183.58	28.70	732.5	6252.73	28.50	772.5	6137.52	28.60
653.0	6047.13	28.60	693.0	6185.16	28.60	733.0	6252.80	28.50	773.0	6134.69	28.60
653.5	6046.99	28.60	693.5	6186.61	28.60	733.5	6252.80	28.50	773.5	6134.21	28.60
654.0	6046.92	28.60	694.0	6187.37	28.60	734.0	6254.87	28.50	774.0	6134.00	28.60
654.5	6046.78	28.60	694.5	6188.06	28.60	734.5	6255.14	28.50	774.5	6133.80	28.60
655.0	6229.36	28.60	695.0	6188.61	28.60	735.0	6255.28	28.50	775.0	6133.52	28.60
655.5	6212.88	28.60	695.5	6188.82	28.60	735.5	6255.42	28.50	775.5	6133.11	28.60
656.0	6166.13	28.60	696.0	6189.44	28.60	736.0	6255.42	28.50	776.0	6132.55	28.60
656.5	6155.45	28.60	696.5	6189.57	28.60	736.5	6255.49	28.50	776.5	6132.00	28.60
657.0	6176.06	28.60	697.0	6189.57	28.60	737.0	6255.56	28.50	777.0	6131.45	28.60
657.5	6151.45	28.60	697.5	6189.51	28.60	737.5	6255.69	28.50	777.5	6130.83	28.60
658.0	6154.76	28.60	698.0	6189.51	28.50	738.0	6265.62	28.50	778.0	6130.14	28.60
658.5	6155.58	28.60	698.5	6191.85	28.50	738.5	6265.90	28.50	778.5	6129.45	28.60
659.0	6155.86	28.60	699.0	6243.08	28.50	739.0	6266.04	28.50	779.0	6128.83	28.60
659.5	6155.79	28.60	699.5	6249.63	28.50	739.5	6266.11	28.50	779.5	6128.14	28.60
660.0	6155.79	28.60	700.0	6249.21	28.50	740.0	6266.17	28.50	780.0	6127.45	28.60
660.5	6128.83	28.60	700.5	6248.80	28.50	740.5	6266.24	28.50	780.5	6126.69	28.60
661.0	6130.35	28.60	701.0	6248.45	28.50	741.0	6278.45	28.50	781.0	6125.94	28.60
661.5	6130.90	28.60	701.5	6248.25	28.50	741.5	6278.52	28.50	781.5	6125.18	28.60
662.0	6131.04	28.60	702.0	6246.18	28.50	742.0	6278.52	28.50	782.0	6124.49	28.60
662.5	6131.04	28.60	702.5	6242.46	28.50	742.5	6278.72	28.50	782.5	6123.87	28.60
663.0	6131.11	28.60	703.0	6240.73	28.50	743.0	6278.86	28.50	783.0	6123.25	28.60
663.5	6131.11	28.60	703.5	6239.22	28.50	743.5	6279.00	28.50	783.5	6122.63	28.60
664.0	6131.04	28.60	704.0	6237.42	28.50	744.0	6263.62	28.50	784.0	6121.94	28.60
664.5	6131.04	28.60	704.5	6235.35	28.50	744.5	6257.00	28.50	784.5	6121.32	28.60
665.0	6130.97	28.60	705.0	6234.46	28.50	745.0	6255.69	28.50	785.0	6120.76	28.60
665.5	6130.90	28.60	705.5	6232.87	28.50	745.5	6255.49	28.50	785.5	6120.14	28.60
666.0	6130.83	28.60	706.0	6231.22	28.50	746.0	6255.42	28.50	786.0	6009.35	28.60
666.5	6042.30	28.60	706.5	6229.36	28.50	746.5	6255.42	28.50	786.5	5996.94	28.60
667.0	6218.81	28.60	707.0	6227.84	28.50	747.0	6255.49	28.50	787.0	5977.77	28.60
667.5	6317.54	28.60	707.5	6226.18	28.50	747.5	6255.49	28.50	787.5	5926.27	28.60
668.0	6601.95	28.60	708.0	6240.59	28.50	748.0	6255.56	28.50	788.0	5856.77	28.60
668.5	6739.43	28.60	708.5	6233.77	28.50	748.5	6255.56	28.50	788.5	5857.25	28.60
669.0	6956.13	28.60	709.0	6234.18	28.50	749.0	6255.63	28.60	789.0	5806.57	28.60
669.5	7013.63	28.60	709.5	6234.04	28.50	749.5	6255.63	28.60	789.5	5849.39	28.60
670.0	7034.04	28.60	710.0	6233.98	28.50	750.0	6255.69	28.60	790.0	5850.22	28.60
670.5	7109.53	28.60	710.5	6233.91	28.50	750.5	6255.69	28.60	790.5	5848.77	28.60
671.0	7296.93	28.60	711.0	6233.91	28.50	751.0	6255.76	28.60	791.0	5830.22	28.60
671.5	7207.09	28.60	711.5	6233.84	28.50	751.5	6255.76	28.60	791.5	5827.19	28.60
672.0	7238.81	28.60	712.0	6233.77	28.50	752.0	6214.81	28.60	792.0	5824.22	28.60
672.5	7895.87	28.60	712.5	6230.74	28.50	752.5	6241.42	28.60	792.5	5841.60	28.60
673.0	7270.39	28.60	713.0	6229.49	28.50	753.0	6241.97	28.60	793.0	5718.18	28.60
673.5	7160.97	28.60	713.5	6228.53	28.50	753.5	6241.63	28.60	793.5	5687.23	28.60
674.0	7159.11	28.60	714.0	6236.39	28.50	754.0	6241.97	28.60	794.0	5641.38	28.60
674.5	7947.72	28.60	714.5	6236.18	28.50	754.5	6242.59	28.60	794.5	5602.56	28.60
675.0	8235.37	28.70	715.0	6236.11	28.50	755.0	6242.94	28.60	795.0	5558.85	28.60
675.5	8482.68	28.70	715.5	6236.18	28.50	755.5	6243.42	28.60	795.5	5503.55	28.50
676.0	8674.84	28.70	716.0	6236.11	28.50	756.0	6243.84	28.60	796.0	5536.78	28.50
676.5	8781.91	28.70	716.5	6236.11	28.50	756.5	6244.18	28.60	796.5	5540.02	28.50
677.0	8858.10	28.70	717.0	6236.18	28.50	757.0	6244.11	28.60	797.0	5520.93	28.50
677.5	8884.09	28.70	717.5	6236.11	28.50	757.5	6244.11	28.60	797.5	5517.34	28.50
678.0	8919.05	28.70	718.0	6236.18	28.50	758.0	6244.04	28.60	798.0	5454.32	28.50
678.5	8922.70	28.80	718.5	6236.11	28.50	758.5	6244.11	28.60	798.5	5416.47	28.50
679.0	8927.18	28.80	719.0	6235.01	28.50	759.0	6244.04	28.60	799.0	5374.14	28.50
679.5	8933.87	28.80	719.5	6232.39	28.50	759.5	6244.04	28.60	799.5	5319.46	28.40
680.0	8941.18	28.80	720.0	6231.63	28.50	760.0	6244.11	28.60	800.0	5269.20	28.40

WELL: SHELL ET AL ARROWHEAD B-41 DST#: TV/O INTERVAL: 621 - 632
TEST REFERENCE#: 300277B FILE STARTS: 3:00:00 on February 7, 1989

LEGEND: ET=Elaped time in (min.), P=Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T	ET	P	T	ET	P	T	ET	P	T
800.5	5226.87	28.40	840.5	2673.21	26.80	880.5	1845.78	25.80	920.5	235.72	25.00
801.0	5230.52	28.40	841.0	2673.35	26.80	881.0	1841.50	25.80	921.0	235.52	25.00
801.5	5239.76	28.40	841.5	2667.00	26.70	881.5	1762.49	25.80	921.5	235.45	25.00
802.0	5233.49	28.40	842.0	2666.45	26.70	882.0	1767.18	25.80	922.0	235.17	25.00
802.5	5220.94	28.30	842.5	2576.96	26.70	882.5	1767.18	25.80	922.5	234.90	25.00
803.0	5218.94	28.30	843.0	2456.23	26.70	883.0	1766.83	25.80	923.0	234.62	25.00
803.5	5147.37	28.30	843.5	2374.12	26.70	883.5	1766.56	25.80	923.5	234.41	25.00
804.0	5109.24	28.30	844.0	2363.71	26.70	884.0	1764.97	25.80	924.0	234.14	25.00
804.5	5063.32	28.30	844.5	2361.71	26.60	884.5	1763.25	25.70	924.5	233.93	25.00
805.0	5017.48	28.30	845.0	2359.84	26.60	885.0	1744.84	25.70	925.0	233.73	25.00
805.5	4969.63	28.20	845.5	2355.91	26.60	885.5	1565.57	25.70	925.5	233.45	25.00
806.0	4920.12	28.20	846.0	2355.98	26.60	886.0	1428.65	25.70	926.0	233.10	25.00
806.5	4938.74	28.20	846.5	2353.09	26.60	886.5	1438.30	25.70	926.5	232.76	25.00
807.0	4937.63	28.20	847.0	2339.57	26.50	887.0	1446.37	25.70	927.0	229.66	25.00
807.5	4922.81	28.20	847.5	2337.23	26.50	887.5	1451.61	25.70	927.5	225.04	25.00
808.0	4920.95	28.10	848.0	2336.06	26.50	888.0	1453.60	25.70	928.0	215.87	25.00
808.5	4838.35	28.10	848.5	2334.75	26.50	888.5	1434.71	25.60	928.5	208.01	25.00
809.0	4765.96	28.10	849.0	2333.92	26.50	889.0	1337.98	25.60	929.0	201.18	25.00
809.5	4659.43	28.10	849.5	2333.30	26.50	889.5	1133.07	25.60	929.5	199.80	25.00
810.0	4627.58	28.10	850.0	2332.75	26.50	890.0	1131.76	25.60	930.0	199.94	25.00
810.5	4629.30	28.00	850.5	2332.27	26.40	890.5	1140.17	25.60	930.5	199.80	25.00
811.0	4614.14	28.00	851.0	2331.58	26.40	891.0	1143.62	25.60	931.0	199.25	25.00
811.5	4611.93	28.00	851.5	2330.96	26.40	891.5	1141.83	25.60	931.5	198.63	25.00
812.0	4548.50	28.00	852.0	2330.33	26.40	892.0	997.04	25.60	932.0	198.01	25.00
812.5	4575.59	28.00	852.5	2329.71	26.40	892.5	811.64	25.50	932.5	197.39	25.00
813.0	4574.90	27.90	853.0	2329.09	26.40	893.0	819.15	25.50	933.0	-6201.43	-573.00
813.5	4574.01	27.90	853.5	2328.54	26.30	893.5	827.57	25.50	933.5	192.36	25.00
814.0	4513.06	27.90	854.0	2328.06	26.30	894.0	830.81	25.50	934.0	190.84	25.00
814.5	4420.81	27.90	854.5	2327.65	26.30	894.5	696.91	25.50	934.5	188.91	25.00
815.0	4312.08	27.90	855.0	2327.23	26.30	895.0	514.82	25.50	935.0	186.57	25.00
815.5	4318.42	27.80	855.5	2326.75	26.30	895.5	513.58	25.50	935.5	183.81	25.00
816.0	4311.94	27.80	856.0	2326.20	26.30	896.0	520.27	25.40	936.0	173.47	25.00
816.5	4303.80	27.80	856.5	2325.72	26.30	896.5	524.75	25.40	936.5	172.02	25.10
817.0	4268.99	27.80	857.0	2325.23	26.30	897.0	526.82	25.40	937.0	170.23	25.10
817.5	4196.32	27.70	857.5	2324.75	26.30	897.5	526.89	25.40	937.5	168.50	25.10
818.0	4093.65	27.70	858.0	2324.20	26.20	898.0	526.54	25.40	938.0	166.57	25.10
818.5	4058.63	27.70	858.5	2323.85	26.20	898.5	526.61	25.40	938.5	164.99	25.10
819.0	4003.06	27.70	859.0	2323.37	26.20	899.0	522.27	25.30	939.0	163.40	25.10
819.5	3994.16	27.70	859.5	2322.96	26.20	899.5	445.74	25.30	939.5	161.74	25.10
820.0	3992.03	27.60	860.0	2322.47	26.20	900.0	441.53	25.30	940.0	160.09	25.20
820.5	3983.41	27.60	860.5	2322.06	26.20	900.5	440.43	25.30	940.5	158.57	25.20
821.0	3983.20	27.60	861.0	2321.44	26.20	901.0	439.88	25.30	941.0	156.99	25.20
821.5	3948.59	27.60	861.5	2311.93	26.20	901.5	439.60	25.30	941.5	155.47	25.20
822.0	3887.16	27.50	862.0	2314.75	26.10	902.0	439.05	25.30	942.0	154.09	25.20
822.5	3786.56	27.50	862.5	2314.27	26.10	902.5	438.84	25.30	942.5	152.71	25.20
823.0	3675.77	27.50	863.0	2313.24	26.10	903.0	438.77	25.30	943.0	151.40	25.20
823.5	3698.73	27.50	863.5	2312.82	26.10	903.5	438.43	25.20	943.5	150.09	25.20
824.0	3694.93	27.40	864.0	2312.55	26.10	904.0	436.50	25.20	944.0	148.71	25.20
824.5	3687.83	27.40	864.5	2313.58	26.10	904.5	435.33	25.20	944.5	147.47	25.10
825.0	3664.18	27.40	865.0	2314.48	26.10	905.0	438.29	25.20	945.0	146.16	25.10
825.5	3625.50	27.40	865.5	2312.27	26.10	905.5	438.08	25.20	945.5	142.37	25.10
826.0	3535.87	27.40	866.0	2311.79	26.10	906.0	436.29	25.20	946.0	133.41	25.10
826.5	3427.28	27.30	866.5	2311.72	26.10	906.5	435.40	25.20	946.5	130.51	25.10
827.0	3384.67	27.30	867.0	2311.79	26.10	907.0	434.57	25.20	947.0	130.37	25.10
827.5	3384.53	27.30	867.5	2311.79	26.00	907.5	434.91	25.20	947.5	130.17	25.00
828.0	3376.12	27.30	868.0	2311.86	26.00	908.0	435.19	25.10	948.0	130.03	25.00
828.5	3375.23	27.30	868.5	2311.72	26.00	908.5	304.19	25.10	948.5	129.96	25.00
829.0	3324.96	27.20	869.0	2311.65	26.00	909.0	227.24	25.10	949.0	129.75	25.00
829.5	3267.19	27.20	869.5	2311.65	26.00	909.5	225.73	25.10	949.5	129.68	24.90
830.0	3167.01	27.20	870.0	2311.51	26.00	910.0	228.90	25.10	950.0	125.48	24.90
830.5	3071.03	27.20	870.5	2311.31	26.00	910.5	230.69	25.10	950.5	125.34	24.90
831.0	3082.20	27.10	871.0	2311.17	26.00	911.0	231.79	25.10	951.0	125.13	24.80
831.5	3074.13	27.10	871.5	2311.24	26.00	911.5	232.42	25.10	951.5	123.69	24.80
832.0	3072.69	27.10	872.0	2310.48	26.00	912.0	232.90	25.10	952.0	122.58	24.70
832.5	3058.62	27.10	872.5	2332.06	26.00	912.5	233.17	25.10	952.5	121.34	24.70
833.0	3055.73	27.10	873.0	2330.82	25.90	913.0	233.59	25.10	953.0	120.10	24.70
833.5	3055.17	27.00	873.5	2331.23	25.90	913.5	233.73	25.10	953.5	119.00	24.60
834.0	3051.59	27.00	874.0	2302.00	25.90	914.0	233.93	25.10	954.0	117.89	24.60
834.5	2964.72	27.00	874.5	2269.59	25.90	914.5	234.21	25.10	954.5	116.86	24.50
835.0	2975.75	27.00	875.0	2242.15	25.90	915.0	234.41	25.00	955.0	116.17	24.50
835.5	2976.64	27.00	875.5	2198.03	25.90	915.5	234.48	25.00	955.5	116.10	24.40
836.0	2976.23	26.90	876.0	2101.57	25.90	916.0	234.69	25.00	956.0	116.10	24.30
836.5	2971.75	26.90	876.5	2065.79	25.90	916.5	235.10	25.00	956.5	116.17	24.30
837.0	2956.24	26.90	877.0	2068.20	25.90	917.0	235.45	25.00	957.0	116.17	24.20
837.5	2910.73	26.90	877.5	2067.65	25.90	917.5	235.66	25.00	957.5	116.24	24.20
838.0	2868.53	26.90	878.0	2067.99	25.90	918.0	236.00	25.00	958.0	116.31	24.10
838.5	2823.86	26.80	878.5	2068.13	25.90	918.5	235.93	25.00	958.5	116.24	24.00
839.0	2777.04	26.80	879.0	2067.85	25.80	919.0	235.93	25.00	959.0	116.31	24.00
839.5	2720.92	26.80	879.5	2060.41	25.80	919.5	235.93	25.00	959.5	116.31	23.90
840.0	2657.90	26.80	880.0	1928.30	25.80	920.0	235.86	25.00	960.0	116.38	23.80

WELL: SHELL ET AL ARROWHEAD B-41 DST#: TWO INTERVAL: 621 - 632
TEST REFERENCE#: 300277B FILE STARTS: 3:00:00 on February 7, 1989

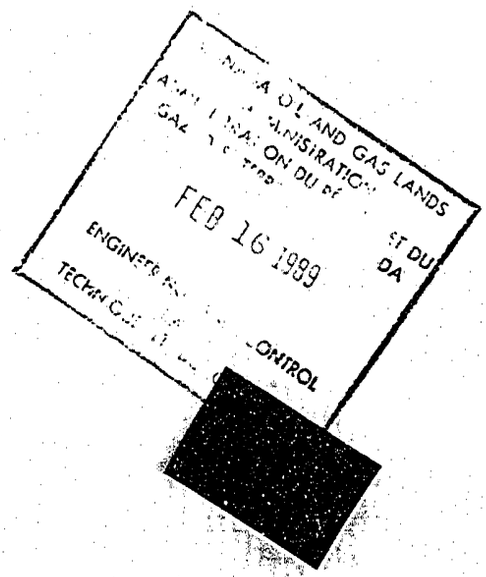
LEGEND: ET=Elaped time in (min.), P= Bottom hole pressure (kPaa), T=Temperature (Deg. C)

ET	P	T
960.5	116.38	23.70
961.0	116.38	23.70
961.5	116.38	23.60
962.0	116.38	23.50
962.5	116.38	23.40
963.0	116.38	23.40
963.5	116.31	23.30
964.0	116.38	23.20
964.5	116.38	23.10
965.0	116.45	23.00
965.5	116.45	22.90
966.0	116.38	22.80
966.5	116.52	22.80
967.0	116.45	22.70
967.5	116.52	22.60
968.0	116.52	22.50
968.5	116.52	22.40
969.0	116.45	22.30
969.5	116.52	22.20
970.0	116.58	22.10
970.5	116.58	22.00
971.0	116.65	21.90
971.5	116.65	21.80
972.0	116.65	21.70
972.5	116.58	21.60
973.0	116.65	21.50
973.5	116.72	21.40
974.0	116.65	21.30
974.5	116.72	21.20
975.0	116.79	21.10
975.5	116.79	21.00
976.0	116.79	20.90
976.5	116.79	20.80
977.0	116.79	20.70
977.5	116.79	20.60
978.0	116.79	20.50
978.5	116.86	20.40
979.0	116.93	20.30
979.5	116.93	20.10
980.0	116.93	20.00
980.5	117.20	19.90
981.0	117.07	19.80
981.5	117.07	19.70
982.0	117.07	19.60
982.5	117.14	19.50
983.0	117.20	19.40
983.5	117.20	19.30
984.0	117.27	19.20
984.5	117.27	19.10
985.0	117.34	19.00
985.5	117.41	18.80
986.0	117.41	18.70
986.5	111.07	18.60
987.0	111.00	18.50
987.5	110.65	18.40
988.0	107.41	18.30
988.5	107.35	18.20
989.0	107.28	18.00
989.5	107.28	17.90
990.0	105.69	17.70
990.5	105.76	17.50
991.0	106.04	17.40
991.5	106.10	17.20
992.0	106.31	17.00
992.5	106.52	16.80
993.0	106.72	16.60
993.5	107.07	16.40
994.0	107.28	16.20
994.5	107.35	16.00
995.0	107.41	15.80
995.5	107.69	15.60
996.0	107.76	15.30
996.5	108.03	15.10
997.0	108.17	14.90
997.5	108.38	14.70
998.0	108.52	14.50
998.5	108.72	14.20
999.0	108.93	14.00
999.5	109.14	13.80
1000.0	109.34	13.60

ET	P	T
1000.0	109.62	13.40
1001.0	110.03	13.10
1001.0	110.52	12.90
1002.0	110.79	12.70
1002.0	111.00	12.50
1003.0	111.14	12.30
1003.0	111.62	12.10
1004.0	111.83	11.90
1004.0	112.03	11.70
1005.0	112.24	11.50
1005.0	112.45	11.30
1006.0	112.65	11.10
1006.0	112.86	10.90
1007.0	113.07	10.70
1007.0	113.27	10.50
1008.0	113.55	10.30
1008.0	113.76	10.10
1009.0	114.03	9.93
1009.0	114.24	9.73
1010.0	114.52	9.52
1010.0	114.72	9.31
1011.0	115.07	9.11
1011.0	115.27	8.90
1012.0	115.48	8.70
1012.0	115.76	8.50
1013.0	116.03	8.29
1013.0	116.31	8.08
1014.0	116.52	7.88
1014.0	116.79	7.68
1015.0	117.14	7.48
1015.0	117.41	7.28
1016.0	117.76	7.09
1016.0	118.03	6.90
1017.0	118.38	6.71
1017.0	118.65	6.52
1018.0	118.93	6.33
1018.0	119.20	6.15
1019.0	119.48	5.97
1019.0	119.82	5.79
1020.0	120.10	5.61
1020.0	120.45	5.44
1021.0	120.79	5.27
1021.0	121.13	5.10
1022.0	121.41	4.94
1022.0	121.69	4.78
1023.0	122.17	4.61
1023.0	122.51	4.46
1024.0	122.79	4.31
1024.0	123.13	4.16
1025.0	123.55	4.01
1025.0	124.10	3.87
1026.0	126.65	3.74
1026.0	128.17	3.70
1027.0	129.06	3.73
1027.0	129.13	3.86
1028.0	128.79	4.05
1028.0	128.44	4.26
1029.0	127.96	4.48
1029.0	127.48	4.71
1030.0	126.93	4.91
1030.0	126.65	5.10
1031.0	126.17	5.26
1031.0	125.89	5.41
1032.0	125.55	5.54
1032.0	125.13	5.63
1033.0	124.86	5.72
1033.0	124.58	5.79
1034.0	124.44	5.83
1034.0	124.17	5.86
1035.0	123.96	5.87
1035.0	123.89	5.87
1036.0	123.75	5.86
1036.0	123.69	5.83
1037.0	123.62	5.80
1037.0	123.55	5.75
1038.0	123.55	5.70
1038.0	123.55	5.64
1039.0	123.62	5.57
1039.0	123.62	5.50
1040.0	123.75	5.42

ET	P	T
1040.0	123.82	5.33
1041.0	123.96	5.24
1041.0	124.10	5.15
1042.0	124.10	5.05
1042.0	122.31	4.94
1043.0	119.96	4.83
1043.0	120.24	4.72
1044.0	120.38	4.61
1044.0	120.58	4.50
1045.0	120.86	4.39
1045.0	121.00	4.27
1046.0	121.20	4.15
1046.0	121.48	4.03
1047.0	121.69	3.91
1047.0	121.96	3.79
1048.0	122.10	3.67
1048.0	122.31	3.55
1049.0	122.51	3.43
1049.0	122.79	3.31
1050.0	123.00	3.19
1050.0	123.20	3.08
1051.0	123.34	2.96
1051.0	123.55	2.85
1052.0	123.82	2.73
1052.0	124.03	2.62
1053.0	124.24	2.52
1053.0	124.38	2.41
1054.0	124.65	2.30
1054.0	124.93	2.20
1055.0	125.13	2.10
1055.0	125.34	2.00
1056.0	125.62	1.90
1056.0	125.82	1.81
1057.0	126.10	1.72
1057.0	126.31	1.63
1058.0	126.37	1.55
1058.0	126.65	1.47
1059.0	126.86	1.40
1059.0	126.93	1.33
1060.0	127.41	1.28
1060.0	127.89	1.26
1061.0	128.10	1.25
1061.0	127.89	1.27
1062.0	127.75	1.30
1062.0	127.68	1.33
1063.0	127.48	1.37
1063.0	127.34	1.41
1064.0	127.27	1.44
1064.0	127.06	1.47
1065.0	127.06	1.49
1065.0	126.93	1.51
1066.0	126.86	1.52
1066.0	126.65	1.52
1067.0	126.65	1.52
1067.0	126.58	1.51
1068.0	126.51	1.50
1068.0	126.44	1.47
1069.0	126.44	1.45
1069.0	126.37	1.42
1070.0	126.31	1.38
1070.0	126.31	1.34
1071.0	126.37	1.30
1071.0	126.37	1.25
1072.0	126.51	1.20
1072.0	126.58	1.15
1073.0	126.72	1.09
1073.0	126.79	1.03
1074.0	126.79	0.97
1074.0	126.79	0.91
1075.0	127.00	0.85
1075.0	127.13	0.78
1076.0	127.27	0.72
1076.0	127.41	0.66
1077.0	127.62	0.59
1077.0	127.75	0.52
1078.0	127.96	0.46
1078.0	128.24	0.38
1079.0	128.44	0.32
1079.0	128.65	0.25
1080.0	128.99	0.18

ET	P	T
1080.0	129.20	0.10
1081.0	129.48	3.e-
1081.0	129.82	0.00
1082.0	130.17	-0.10
1082.0	130.44	-0.10
1083.0	130.79	-0.20
1083.0	130.99	-0.30
1084.0	131.55	-0.40
1084.0	131.82	-0.40
1085.0	132.24	-0.50
1085.0	132.30	-0.60
1086.0	132.58	-0.60
1086.0	132.86	-0.70
1087.0	133.06	-0.70
1087.0	133.27	-0.80
1088.0	133.27	-0.80
1088.0	133.55	-0.80
1089.0	133.75	-0.90
1089.0	133.96	-0.90
1090.0	138.85	-1.00
1090.0	134.51	-1.00
1091.0	134.79	-1.10
1091.0	134.99	-1.10
1092.0	135.20	-1.20
1092.0	135.41	-1.20
1093.0	135.48	-1.30
1093.0	135.61	-1.30
1094.0	135.75	-1.40
1094.0	136.03	-1.40
1095.0	136.23	-1.40
1095.0	136.37	-1.50
1096.0	136.72	-1.50
1096.0	136.92	-1.60
1097.0	137.06	-1.60
1097.0	137.13	-1.70
1098.0	137.48	-1.70
1098.0	137.68	-1.80
1099.0	137.82	-1.80
1099.0	138.16	-1.90
1100.0	138.10	-1.90
1100.0	138.44	-1.90
1101.0	138.51	-2.00
1101.0	138.92	-2.00
1102.0	138.99	-2.10
1102.0	139.27	-2.10
1103.0	139.47	-2.10
1103.0	139.82	-2.20
1104.0	139.96	-2.20
1104.0	140.30	-2.30
1105.0	140.72	-2.30
1105.0	140.58	-2.30
1106.0	140.85	-2.40
1106.0	141.34	-2.40
1107.0	141.54	-2.40
1107.0	142.37	-2.50
1108.0	142.16	-2.50
1108.0	142.51	-2.50
1109.0	142.92	-2.60
1109.0	142.99	-2.60
1110.0	143.34	-2.60
1110.0	143.82	-2.70
1111.0	143.89	-2.70
1111.0	144.23	-2.70
1112.0	144.03	-2.70
1112.0	144.85	-2.80
1113.0	144.85	-2.80
1113.0	144.85	-2.80
1114.0	145.20	-2.90
1114.0	145.40	-2.90
1115.0	145.54	-2.90
1115.0	145.89	-3.00
1116.0	146.02	-3.00
1116.0	146.65	-3.00
1117.0	146.99	-3.10
1117.0	147.13	-3.10
1118.0	147.27	-3.10
1118.0	147.54	-3.10
1119.0	147.54	-3.20
1119.0	147.75	-3.20
1120.0	148.02	-3.20


AND GAS LANDS
FEB 16 1989
ENGINEER
CONTROL

OTTAWA COPY

9211-S6-2-1

CL 3A 10/84 SI

Co. SHELL CANADA LIMITED

CONTINENTAL LABS LTD. SHELL ET AL ARROWHEAD.

Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

FEB 06-09
BIT 2(RR) HP5A
DC
311mm

FOS 12/14
RPM 60
SPM 110x2
PP 15000

DEN 1090
VIS 66
PH 10.0
WL 7.4

670

POWER OUT TO ALL TRAILERS.

680

690

SHAKER PLUGGED

700

710

FOS 15/16
RPM 70
SPM 110x2
PP 15000

DEN 1090
VIS 61
PH 10.5
WL 8.6

720

POWER OUT ON MUD TANKS.

730

NOTE:
Ream 215.9mm hole, to 311m/m. (550-667m)

LAG 21 MINS.

3/4° N49E

LS: M BY BRN- LT BRN, MIS-CRPXL, HD, ARG, SLTY I/P, DNS.

LS: CRM-LT BRN-BY BRN, FRED M CXL-VF-FXL I/P, SL HD-HD, ARG-V ARG I/P, FOS, N V Ø.

LS: GY-DK GY, MICXL, FRM-V ARG-SHLY I/P, FOS, DNS.

SH: M GY, SFT-FRM, FISS-PLTY, V CALC FOS.

LS: M GY, FRM-SL HD, MICXL, VARG-SHLY, DNS, ABNDT FOS.

LS: MGY-BL GY, CRP-PRED MICXL, FRM-BL HD, ARG-SHLY, V FOS.

SH: MGY, SFT-FRM, PLTY FISS, I/P, CALC.

LS: SFT-LT BRN, MGY, CRP-MICXL, SFT-BL HD, SL TEX I/P, SL ARG-VARG I/P, TR FOS, TR PYR, DNS.

SH: M-DKGY, PLTY, FRM, V CALC, TR DISSEM PYR, PYR.

CANADA
ADMINISTRATIVE
CASE REC
CONTROL
FEB 16 1999

CL 3A 10/64 SI

Co. SHELL CANADA LIMITED

CONTINENTAL LABS LTD. SHELL ET AL ARROWHEAD.

Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

FEB 08-09 DC
BIT 7(RR) HP51A TFA 311mm

FOB 12/14
RPM 80
SPM 110x2
PP 15000

DEN 1090
VIS 66
PH 10.0
WL 7.4

670

680

690

700

710

720

730

POWER OUT TO ALL TRAILERS.

SHAKER PLUGGED

POWER OUT ON MUD TANKS.

NOTE:
Ream 215.9mm hole, to 311mm. (550-667m)

LAG 21 MINS.

3/4° N49E

LS: M BY BRN- LT BRN, MIC-CRYPTXL, HD, ARG, SLTY I/P, BNS.

LS: CRM-LT BRN-BY BRN, PRED M GXL-VF-FXL, I/P, ∑C, HD-MD, ARG-V ARG I/P, FOS, N V P.

LS: GY-BK, GY, MICOSC, FRM, V ARG-SHLY I/P, FOS, BNS.

SH: M GY, SFT-FRM, FISS-PLTY, V CALC FOS.

LS: M GY, FRM-SC RO, MICXL, VARG-SHLY, BNS, ABNDT FOS.

LS: MGY-BK, ST, FRM, PRED MICXL, FRM-SC RO HD, ARG-SHLY, V FOS.

SH: M GY, SFT-FRM, PLTY FISS, I/P, CALC.

LS: GRY-LT BRN, PRY, ARG-FISSILE, SFT-SL HD, SL TR I/P, ∑C ARG-VARG I/P, TR FOS, TR PYR, SHELL FRAG.

SH: [illegible], PLTY, FRM, V CALCITIC DIESEL FLV [illegible]

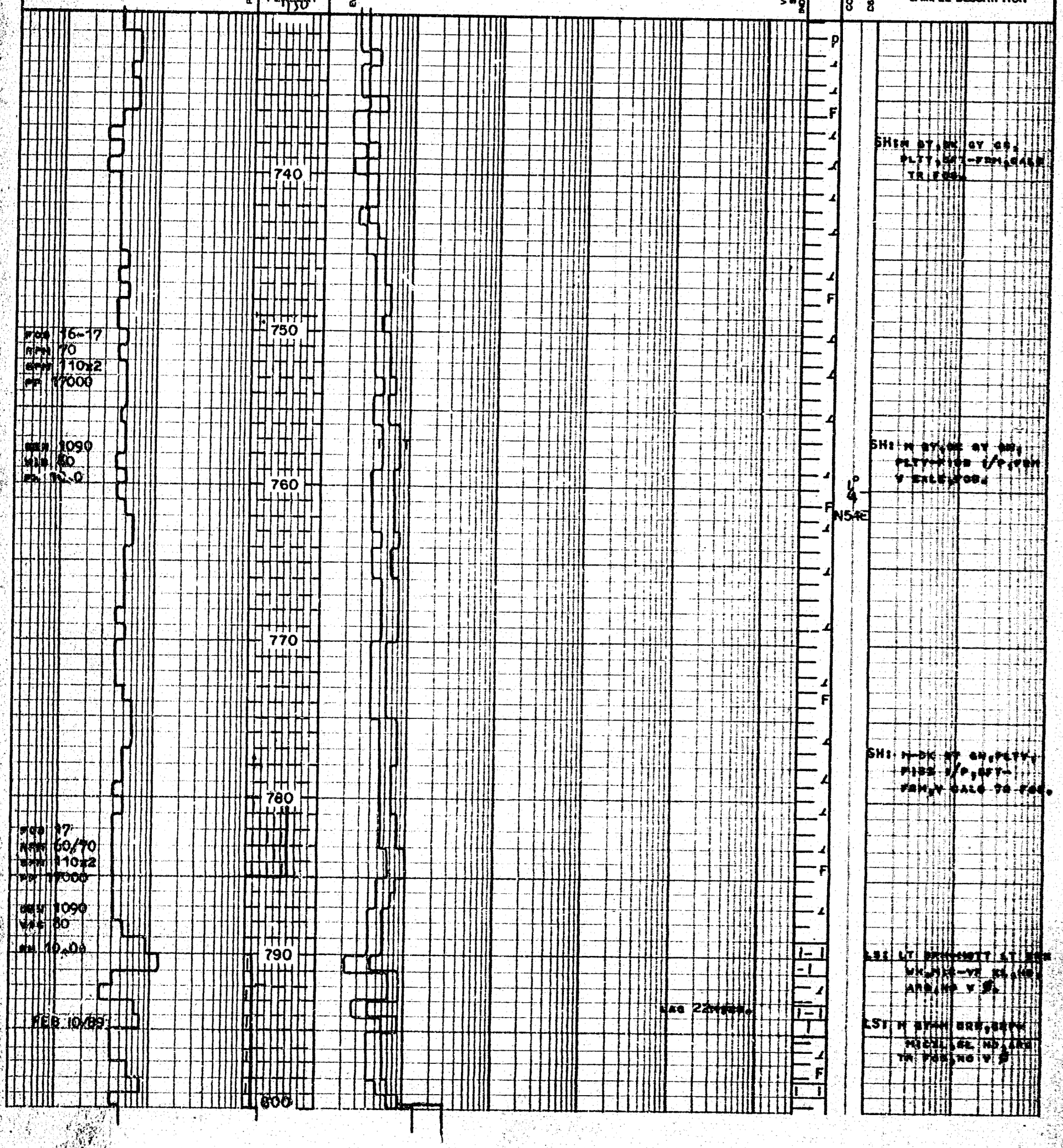
Cl. 3A 10/84 SI

Co. SHELL CANADA LIMITED — CONTINENTAL LABS LTD. — SHELL ET AL ARROWHEAD — Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS / SAMPLE DESCRIPTION

750
740
760
770
780
790
800

FEB 10/89



CL 3A 10/84 SI

Co. SHELL CANADA LIMITED — CONTINENTAL LABS LTD. — SHELL ET AL ARROWHEAD — Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS / SAMPLE DESCRIPTION

750
760
770
780
790
800

WOB 16-17
RPM 70
SPM 110x2
PP 17000

MW 1090
VIS 50
PH 10.0

WOB 17
RPM 60/70
SPM 110x2
PP 17000

MW 1090
VIS 50
PH 10.0

FEB 10/89

LAG 22

P
F
F
F
F
F
F
F

N5AE

SH: M-DK GY-BN SLTY
FISS-SL CALC TR FOS

SH: M-DK GY-BN SLTY
FISS-SL CALC TR FOS

LST: LT BRN-MOTT LT BRN
MHXLN-VF XLN
ARR(NO V

LST: M GY-BN ARR
PSC-SL SL HD
TR FOS,NO V

CL 3A 10/34 SI

Co. SHELL CANADA LIMITED — CONTINENTAL LABS LTD. — SHELL ET AL ARROWHEAD — Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS / SAMPLE DESCRIPTION

880

890

900

910

920

930

940

T

T

T

B2

90-90.5

ROP 17
WOB 55/60
RPM 110x2
PP 17000

GEN 1110
WTR 55
PD 10.0
VL 8.0

P

F

NIGW

LST: WHI-CRM F-MX
MICAN PYR, SH IP-
SL NOSTR PYR-
DISSEM PYR, R V

SH: M-DK GY, FRM, PLTY
FISS, V/P

LST: TAN-LT GY BRN,
MTCR-F XLN, SL HD,
SL ARG, P/P, TR PYR,
NO

SH: M-DK GY-DK GY GN,
PLTY, SFT-FRM,
SL SOL, I/P

SH: M-DK GY-GY GN,
PLTY-FISS I/P,
FRM, TR FOS,

SH: MAY-GY GN, PLTY-
FISS I/P, FRM,
TR PYR, TR CALC,

CL 3A 10/84 SI

Co. SHELL CANADA LIMITED

CONTINENTAL LABS LTD. SHELL ET AL ARROWHEAD

Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

880

890

900

910

920

930

940

90-90.5

P

F

N16W

LS: VH-CRM,F-MXL,
MICXL,FOS,BRT,
SL HOR TR PYR,
DISRCH PYR,N V

SH: M-DK GY,FRM,PLTY,
FISS,1/P,

LS: TAN-LT GY BRN,
MICXL,FOS,SL HOR,
SL ARG,1/P,TR PYR,
NO

SH: M-DK GY-DK GY GN,
PLTY,SFT-FRM,
SL CALC 1/P,

SH: M-DK GY-GY GN,
PLTY-FISS 1/P,
FRM,TR FOS,

SH: MGY-GY GN,PLTY,
FISS 1/P,FRM,
TR PYR,TR FOS,

POR 17
PERM 55/60
SHK 110x2
PR 17000

OCH 1110
VIS 56
PH 10.0
WL 8.0

CL 3A 10/84 SI

Co. **CONTINENTAL LABS LTD.** Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

800-802 DT. 10std.

03-04

05-08

809

815

LAG 25 METRES

WOB 17
RPM 60
SPM 110x2
PP 17000

DEN 2095
VIS 61
PH 10.5
WL 9.6%

RPM 50/60
WOB 17
SPM 110x2
PP 17000

DEN 2095
VIS 64
PH 10.0
WL 9.8

810 820 830 840 850 860 870

LS: M GY-LT GY ENH.CRY-
MICRXLN, MD,ARG,
FOS, NO V PO.

LS: TRNSPR-WT GRN,GYSH
XL,VFX, SANDY, CLY
XL,VFX PYR,PYTIC INCL
ARGIN, WXS,BRCH,
TRL FLOR,SLOW CRUSHY
DULL WHT WH SHADE,
DRY CUTS,
NO V PO.

SH: MARLY, SLTY,SFT-
FRM,BLKY, CALC,TR
FOSS.

LS: CRM-BFF GY,MIC-VF
XL,SL MR, LTY
TRX, VFP,SL ARG,
NO V PO.

LS: VR-CRM-TAN,TR
ROSE, COL XL,
VF-CRS,SL MD,SL-
SL HVY TRX,TR
FOS, NO V PO.

SH: M-DK GY,SOL ST SL
FRED, SLTY-SDY,
SL MIC-MICA,TRACE

SLTSTN: MOD-ST SL MR,
MD,SL-VX SL PO,
CALC,NO TR SL SH.

TR LS: TAN-BUFF,VFX-
FXL,SL MR, TR CLAY
NO V PO.

CL 3A 10/84 SI

Co. **CONTINENTAL LABS LTD.** Well **SI**

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

800-802 DT. 10 std.

03-04

05-06

802

815

LAG 25 metres

FOR 17
WOB 60
RPM 110x2
PP 19000

DRM 1095
VIS 61
PH 10.5
WL 2.6F

RPM 50/60
TOB 17
RPM 110x2
PP 17000

DRM 1095
VIS 64
PH 10.0
WL 7.8

810 820 830 840 850 860 870

0°

SS: M-CRSE, SBRD, SBSPH, CLN, FRM, NOD, ARG, TR PYR, NFOS, NO VFOS

SS: TRANSL-LT GRY, VFGR, SBANG-SBRD, SLTY IP, ARG MTX, FRM-FRI, SLTY IN PART, TR PYR, OIL STN, ABDNT FOS, CHERT, TR CHLC, FLOR, SLOW STRMY CUT, BULL WHT RESID, DRY SMPLS, NO VFOS

SHS: M-DKGY, BLTY, SFT-FRM, SBBLKY, TR CALC, NFOS, TR PYR

LSS: CRM-LT GY, MIC-VF XLN, ARG, NOD, SLTY TR PYR, SL ARG, NO VFOS

LSS: LT-MED GY, MIC-VF XLN, SOL XL, VF-MOD, SL ARG, SL CHTY TR, TR FOS, NO VFOS

SHS: M-DK GY, SFT-FRM, BT, NON FISS-MOD FISS, SL MICA, TR PYR

SLTSTS: GRY-BT, SBBLKY, MOD-VF SND, SLTY, CALC, TR CHLC

TR LSS: TAN-BFF, VFXLN, SOL, NOD, TR FOS, NO VFOS

CL 3A 10/84 SI

Co. **CONTINENTAL LABS LTD.** Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

950

960

970

980

990

1000

1010

FEB 11/89

FOR 17
RPM 35/60
SPM 110x2
PP 17000

DEN 1110
VIS 70
PH 10.0
WL 8.4

DEN 1110
VIS 85
PH 10.5
WL 8.0

LAG 28 MINS

1 1/4

N64E

SH: [illegible] PREV FLTY-F195 1/P, FRM, TR FOS,

SH: M-DK GY-DK GY GR, PREV FLTY-F195 1/P, FRM, TR PYR, TR FOS, SL CALC 1/P,

LS: M-DK SL GY, CRPLN MICXL, NOD, SL ARG, ONS,

SH: DKGY, FRM, PREV FLTY-F195 1/P, TR PYR, TR FOS,

CL 3A 10/84 SI

Co. CONTINENTAL LABS LTD. Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS / SAMPLE DESCRIPTION

950

960

970

980

990

1000

1010

BEG W/#9

FOR 17
PPF 55/60
SPM 110x2
PP 17000

DEN 1110
VIS 70
PH 10.0
WL 8.4

DEN 1110
VIS 85
PH 10.5
WL 8.0

LAG 28 MINS

1 1/4

N64E

SH: [illegible] PRED PLTY-F ISS [illegible], FRM, TR POS,

SH: M-DK GY-DK GY GN, PRED PLTY-F ISS I/P, FRM, TR PYR, TR FOS, SL CALC I/P,

LS: M-DK SL GY, CRYP-MICXL, MD, SL ARG, OWS,

SH: DKGY, FRM, PRED PLTY-F ISS I/P, TR PYR, TR FOS,

CL 3A 10/84 SI

SHELL CANADA LIMITED

CONTINENTAL LABS LTD. SHELL ETAL ARROWHEAD

Well SI

PENETRATION RATE MIN/M

POROSITY

LITHOLOGY IN PERCENT

TOTAL SHOW EVALUATOR

HYDROCARBON DETECTION AND ANALYSIS

VISUAL SHOW INDICATOR

CORE

DST

CUTTINGS SAMPLE DESCRIPTION

1020

1030

1040

1050

FEB 12

TRIP
D.C.

DC

DTG 4200/600/3hrs 50 mins

F

P

F

F

F

SH: DK GY, MGY, FRM, PLTY-FISS I/P, TR PYR, POS.

SH: M-DK GY, FRK, PLTY-FISS I/P, TR PYR DISSEM PYR, POS.

CL 3A 10/84 SI

SHELL CANADA LIMITED

CONTINENTAL LABS LTD. SHELL ETAL ARROWHEAD

Well SI

PENETRATION RATE MIN/M

POROSITY

LITHOLOGY IN PERCENT

TOTAL SHOW EVALUATOR

HYDROCARBON DETECTION AND ANALYSIS

VISUAL SHOW INDICATOR

CORE

DST

CUTTINGS SAMPLE DESCRIPTION

1020

1030

1040

1050

WOB 1110
RPM 16/17
Y/P 71
PP 10.0
W/ 8.0

RPM 16/17
WOB 65
PP 7500
SPM 110x2

FEB 12

C/G
D.C.

D.C.

DTG 1200/600/3hrs 50mins

F

F

F

F

SH: BK GY, GRY, FRM,
SLTY-FISS I/P,
TR PYR, FOS.

SH: (+BK GY, FRM, PCTY-
FISS I/P, TR PYR
DISSEM PYR, FOS.

CANADA OIL AND GAS LANDS
ADMINISTRATION
ADMINISTRATION DU PÉTROLE ET DU
GAZ DU CANADA
FEB 16 1989
ENGINEERING AND CONTINENTAL
BRANCH
TECHNIQUE ET DU CONTINENTAL

Gravity logs

OTTAWA COPY

9211-S6-X-1
2.

CL 3A 10/84 SI

SHELL CANADA LIMITED — CONTINENTAL LABS LTD. SHELL ET AL. ARROWHEAD — Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS / SAMPLE DESCRIPTION

1020

1030

1040

1050

1060

1070

WOB 11/13
RPM 71
PP 13.0
MW 9.0

WOB 16/17
RPM 65
PP 17500
SPM 110x2

FEB 16

DTG 4200/600/3hrs 50 mins

DC

FEB 16-17

NB 9 V2HJ (219mm)

RUN INT CSG

AIR DRILL from 1056m

NB 10 MDCH (273mm)
(AIR HAMMER)

SCALE CHANGE: 1:240
1:600

F

P

F

F

F

SH: DK GY, GRY, FRM, FLTY-FIBS W/P, TR PYR, POS.

SH: M-DK GY, FRM, FLTY F-MED W/P, TR PYR DISSEM PYR, POS.

SH: DK BRN-GY, FRM, P-FRM, FRM-CL BIC-MICA, CALC.

SH: DK GY-GY BLK, FRM, FISS, CALC.

CL 3A 10/84 SI

Co. SHELL CANADA LIMITED. CONTINENTAL LABS LTD. SHELL ET AL ARROWHEB B-41 Well SI

PENETRATION RATE MIN/M	POROSITY	LITHOLOGY IN PERCENT	TOTAL SHOW EVALUATOR	HYDROCARBON DETECTION AND ANALYSIS	VISUAL SHOW INDICATOR	CORE	DST	CUTTINGS SAMPLE DESCRIPTION

FOR 1-1
RPM 15
AIR PRESS 1800KPA
AIR VOL 45M³/MIN

1100

1123

1150

1175

1200

FOR 2-1
RPM 15
AIR PRESS 2100KPA
AIR VOL 55M³/MIN

1225

1250

CORE
DST

3/4° S5E

SHS V DK GY-BLK, [illegible] HD, CALC

SHS BKGY-BLK, FISS- [illegible] BLKY 1/2, SL HD, CALC.

0° S75E

SHS BKGY-BLK, FISS- [illegible] SL HD, SL CALC.

1/2° S46E

CL 3A 10/84 SI

Co. SHELL CANADA LIMITED — CONTINENTAL LABS LTD. SHELL ET AL ARROWHEAD 8-41 — Well SI

PENETRATION RATE MIN/M	POROSITY	LITHOLOGY IN PERCENT	TOTAL SHOW EVALUATOR	HYDROCARBON DETECTION AND ANALYSIS	VISUAL SHOW INDICATOR	CORE	DST	CUTTINGS SAMPLE DESCRIPTION
		1250						

CL 3A 10/68 C!

CO. SHELL CANADA LIMITED — CONTINENTAL LABS LTD. SHELL ET AL ARROWHEAD B-41 — Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATION | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

D/C

FOR 0-1
RPM 15
AIR PRESS 2400KPa
AIR VOL 850M³/MIN.

1450

1475

1500

FOR 0-1
RPM 15
AIR PRESS 2800KPa
AIR VOL 850M³/MIN.

1525

1550

1575

1600

66-67

gg 275000/15000/5MIN

gg 240000/20000/5MIN.

gg 240000/20000/5MIN

gg 480,000/20000/10MIN

gg 150,000/15000/5MIN

gg 130000/20000/8MIN

gg 140000/15000/8MIN

gg 150000/15000/6MIN

gg 120000/10000/4MIN

gg 350,000/10000/30MIN

gg 160,000/20000/5MIN

gg 200,000/10000/5MIN

gg 150,000/15000/5MIN

1/2° S9W

1/2° S7W

1/2° S4W

CL 3A 10/84 S:

Co SHELL CANADA LIMITED — CONTINENTAL LABS LTD. SHELL ET AL ARROWHEAD B -41 — Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

1650
1675
1700
1725
1750
1775

FEB 5/69
KOB 0-1
RPM 15
AIR PRESS 2800KPa
AIR VOL 53m³/min

TRAP PLUGGED.

ss 430,000/10000/30MIN

ss 180,000/10000/5MIN

ss 180,000/15000/5MIN

ss 170,000/15000/5MIN

ss 410,000/10000/4MIN

ss 120,000/10000/4MIN

ss 90,000/10000/4MIN

ss 75000/7000/4MIN

ss 75,000/1000/4MIN

ss 60,000/1000/-

ss 55,000/1000/-

ss 150,000/5000/45MIN

ss 53,000/1000/4MIN

ss 75,000/1000/-

1/2° N24E

3/4° S89W

CL 3A 10/84 SI

Co. SHELL CANADA LIMITED — CONTINENTAL LABS LTD. SHELL ET AL ARROWHEAD — Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

1800

MIN MDCH

FEB 8-9
RPM 20
AIR PRESS 375KPA
AIR VOL 33m³/min

1825

T1 (6-17)

T2

T3

1850

FEB 20/89

1875

1900

Increase air flow to stop

1925

1950

ss 50,000/1000/5 MIN

ss 80,000/5000/5MIN

ss 300,000/5000/15 MIN

T3 500,000/5000/10.5MIN

ss 160,000/20000/5MIN

ss 68,000/3000/45MIN

ss 90,000/8000/45MIN

ss 130,000/16000/5MIN

ss 125,000/20000/5MIN

NI4W

NI4E

98W

CL 3A 10/84 SI

Co. SHELL CANADA LIMITED

CONTINENTAL LABS LTD. SHELL ETAL ARROWHEAD -8

Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

1975

2000

2025

2050

2075

2100

2125

RIG DEPTH COUNTER DOWN

INTEGRATOR DOWN

RPM 20

A/A

cg 90,000/2000/5 min

cg 80,000/2000/6min

cg 600,000/10000/5min

cg 100,000/30,000/6min

cg 80,000/5,000/5min

cg 90,000/10,000/6min

cg 60,000/10000/4min

cg 450,000,15,000/5min

cg 80,000/15,000/5min

cg 75,000/15,000/5min

cg 65,000/20,000/6min

65,000/20,000/6min

cg 80,000/20,000/6min

cg 330,000/10,000/5min

cg 120,000/10,000/6min

cg 120,000,10,000/6min

cg 280,000/5,000/7 mins.

1 1/8° N86W

1 1/4° N2W

1 1/4° S69W

CL 3A 10/84 SI

Co. SHELL CANADA LIMITED — CONTINENTAL LABS LTD. SHELL ET AL ARROWHEAD A-B 41. — Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

2150

2175

2200

2225

2250

2275

2300

INTEGRATOR DOWN

FEB 21/68

1¼° S79W

1⅜° N04W

1⅜° N15W

CL 3A 10/64 SI

Co. SHELL CANADA LIMITED

CONTINENTAL LABS LTD. SHELL ET AL ARROWHEAD

Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

RIG UP

2325

2350

2375

GAS TRAP DOWN

2400

2425

2450

2475

ea 70,000/10,000/6min

ea 50,000/10000/6min

ea 40,000/10,000/5min

ea 470,000/5000/42 min

ea 50,000/5000/7min

ea 60,000/10,000/6min

ea 60,000/10,000/5min

ea 50,000/5000/5min

ea 16,000/4,000/5min

ea 82,000/2000/6min

CL 3A 10/84 SI

Co. SHELL CANADA RESOURCES — CONTINENTAL LABS LTD. — SHELL ET AL ARROWHEAD B-41 — Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

SCALE CHANGE: 1:600 / 1:240

2475

2480

WOB 0-2
RPM 20
MUD PRESS 2650KPA
MUD VOL 73 M³/MIN

2490

gg 52,000/6000/7MIN

gg 52000/6000/7MIN

2500

FEB 22,23/69
MW12 FP50A

FEB 16
RPM 60
SPM 120
PRESS 1080
VIS 62
WT 10.5
WL 7.8

Frac

2510

AIR DRLG COMPLETED (2504m)

RESUME DRLG with GEL/CHEM MUD

gg 37,000/18,000/-

PRODUCED GAS ORIGINATES FROM FRAC AT 1467-68m

2520

gg 114,000/30,000/7MIN

2530

gg 132,000/15000/2?MIN

gg 260,000/30,000/8MIN
GAS 82,000/14,000/8MIN

2540

SH: GY-DY GN, PLTY, SFT-FRM, SL MIC-MICA.

SH: DK GY, GY GRN, PLTY, FRM-SL HD, MIC-MICA.

SH: DKGY-GY BLK, FISS, FRM, SL MIC-MIC MICA.

SH: DK GY-GY GN, PLTY-BLKY, FRM, SL MIC-MICA I/P ABNT? SYD.

SH: M GY-GY GN, DKGY, PLTY-BLKY, FRM, SL MIC-MICA I/P ABNT SYD.

CL 3A 10/84 SI

Co SHELL CANADA LIMITED

CONTINENTAL LABS LTD. SHELL ET AL ARROWHEAD B-41

Well SI

PENETRATION RATE MIN/M	POROSITY	LITHOLOGY IN PERCENT	TOTAL SHOW EVALUATOR	HYDROCARBON DETECTION AND ANALYSIS	VISUAL SHOW INDICATOR	CORE	DST	CUTTINGS SAMPLE DESCRIPTION

2550

2560

2570

2580

2590

2600

2610

DEN 1080
VIS 64
PH 9.5
WL 7.2
FEB 24/89

FOR 16/17
RPM 60
SPM 60/2
PP 1400/100

DEN 1070
VIS 50
PH 10.0
WL 7.5

98.8
99.2

04

06.2

2

3

T

F

cg 134,000/20,000/6 MIN

cg 116,000/20,000/6MIN

LAB 49 MINS.
cg 176,000/16,000/9MIN

cg 140,000/20,000/9MIN

cg 235,000/20,000/38 MIN

cg 230,000/32,000/6 MIN

sos 160,000/32,000/2MIN
cg 240,000/24,000/6 MIN

2 1/4° N89W

SHS FRGR M-DK GY, SOFT-FRM, SL MIC-MICA, ss

LS: V. DK. GRN, BRN, BLK ARGXL, NO, VXY, SLMS, CHC.

LS: PRED/A ALGD GRN-LT-M BRN, SL NO, MEGXL, SL GLTY TEX, GLN, NO V Ø. FAIR SPL /ABNDT M OVG.

LS: PRED V DK BRN-BRN BLK, M BRN I/P, NO, ORPXL, GLN, ONS, TR LSE CALC, TR CALC FILLED FRAC. P SPL /ABNDT SH OVG.

LS: V DK BRN-BRN BLK, LT BRN, ORPXL, NO, GLN, ONS, TR LS: V LT GY, MICXL YRN, SLTY TEX, NVP.

LS: DK BRN-BRN BLK, ORPXL-MICXL I/P, NO, GLN, ONS, TR CALC FILLED FRAC, TR FOS.

LS: DK BRN-BRN BLK, ORPXL, NO, ONS, ABNDT LSE CALC AND CALC FILLED FRAC.

CANADA OIL AND GAS LANDS
ADMINISTRATION
ADMINISTRATION DU PÉTROLE ET DU
GAZ DU CANADA
MAR 2 1989
ENGINEERING AND CONTROL
TECHNIQUE ET DU CONTRÔLE

OTTAWA COPY

9011-S621

CL 3A 10/84 SI

Co. SHELL CANADA LIMITED — CONTINENTAL LABS LTD. SHELL ET AL ARROWHEAD 6-41 — Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

ROP 17-19
WOB 35-60
RPM 130
PP 13000

2830

GS 3400/1400/6 MIN

BRN 1120
VIS 62
PH 10.0

2840

GS 5600/2600/5 MIN

FEB 28/89

2850

GS 5600/2000/4 MIN

DC

(Unable to run 5600/2000/15 min.
to 6600/2000/15 min.

CORE no 3 2855.0-2869.8m

GS 2000/1200/6 CUT 14.8m REC 4.47m
(Jammed off)

BIT 14 CB SCP778
WOB 2-5
RPM 70-80
PP
MARCH/89

BRN 1120
VIS 73
PH 10.0

2860

LAG 71 MIN

DID NOT CIRC OUT

BIT 15 RR SCP778

TD 2868m.

CORE no 4 2869.8-2887.8m

CUT 18.0m REC 18.0m

GS 3000/1600/5 MIN

WOB 2-5
RPM 95
SPM 95
PP 7000

BRN 1115
VIS 68
PH 10.0

2880

GS 6600/4000/30 min.
TO 4400/3000/15.5 min.

MARCH 02/89
MD 16 M84E
RIG D/C

RIG D/C.

2890

CORE 3

CORE 4

CANADA OIL AND GAS LANDS
ADMINISTRATION
GAZ
MAR 13 1989
ENGINEERING
TECHNIQUE

CL 3A 10/84 SI

Co. SHELL CANADA LIMITED

CONTINENTAL LABS LTD. SHELL ETAL ARROWHEAD - B -41

Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

FOR 16-18
RPM 60
SPM 60x2
PP 3000

GOOD INDICATION OF PERMEABLE POROSITY

2903 M

DEN 1120
VIS 58
PH 10.0
WL 7.6

MAR 03/89

2900

Gin plugged shaker tank

TGR 2400/2000/-

LAG 58 MINS

2910

ca 2600/1200/4MIN

FOR 16-18
RPM 60
SPM 60x2
PP 3000

2920

ca 4200/2000/3MIN

2930

ca 4400/2000/4MIN

DEN 1115
VIS 58
PH 10.0
WL 7.6

2940

ca 4400/2100/3MIN

DEN 1105

2950

3 2 1

DST #1 2934-2959

DEN 1110
VIS 75

2960

CL 3A 10/84 SI

Co. SHELL CANADA LIMITED. | CONTINENTAL LABS LTD. | SHELL ET AL ARROWHEAD B-41 | Well | Si

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

FOB 17-18
RPM 60
GPM 60x2
PP 3500

DEN 1115
VIS 75
PH 10.0
WL 8.5

2970
2980
2990
3000
3010
3020
3030

NO Power on mud tanks

T

Did not CO.

5½° N5W

DOL: LT-MDK BRN, N GY, PRED GRNXL MICXL S/P, HD, CLN, DNS, TR FRAC FILLED / MLKY WH CRYXL DOL, TR PYR.

SG 25,000/2000/7½ MIN

CG 20,000/1200/6 MIN

DOL: LT-MN BRN, GY-BUFF, GRN-MICXL, WXY-F SLTY TEX, DNS, TR FRAC/ CALC, TR PYR BIT, TR DISSEM PYR.

CG 8000/600/5 MINS.

DOL: TR VF XL, BUFF-LT BRN, BRIT-FRM, TR DISSEM PYR, NO V Ø.

SH: BRN SN, SFT, FISS.

MAR 04/89
BIT 17 HR61A

FOB 16-18
RPM 50
GPM 60x2
PP 11000

DEN 1120
VIS 63
PH 9.5
WL 9.5

TG 152,000/2,000/12 HRS.
CG 4400/1200/5 MIN
TGR 7200/2200/-

CG 2200/1400/4 MIN

DOL: LT BRN-DK BRN-GY-BL GY, CRPXL-1/P MICXL, HD, PRED WXY TEX, TR PYR, DNS.

SH: TR BL GY, HD, BLKY, SIL, CLR QTZ GR-F-M GR, BRANG.

CG 6800/1000/5 MIN

DOL: GY-BL GY, LT GY WH, CRP-MICXL, HD, DNS, TR DISSEM PYR.

MAR 05/89

CL 3A 10/84 SI

Co. SHELL CANADA LIMITED — CONTINENTAL LABS LTD. SHELL ET AL ARROWHEAD B-41 — Well SI

PENETRATION RATE MIN/M | POROSITY | LITHOLOGY IN PERCENT | TOTAL SHOW EVALUATOR | HYDROCARBON DETECTION AND ANALYSIS | VISUAL SHOW INDICATOR | CORE | DST | CUTTINGS SAMPLE DESCRIPTION

FOB 16-18
RPM 50
SPM 60x2
PP 10000

DEN 1130
VIS 60
PH 10.5
WL 6.6

3040

CG 5600/600/4 MIN

SH: M-DK GY, FRM, BLKY.

DOL: LTGY-M GY, LT GY BRN, CRPXL, HD, OLN, ONS, TR PYR, DISSEM PYR.

TR LT GY-WH DOL F XL, BRIT, TR DISSEM PYR, NO V P.

3050

CG 3000/600/4 MIN

LAG 60 MIN

3060

FOB 16-18
RPM 60
PP 11000
SPM 60x2

DEN 1130
VIS 63
PH 10.0
WL 7.0
DEN 1115

CG 2800/600/4MIN

DOL: A/A / TR RD BRN DOL, CRPXL, HD, ONS.

SH: RD BRN-DK RD BRN TR PURPLE, SFT, FISS, SL DOL.

3070

2

T

SG 46,000/2000/53 MIN

73-75.4

SLTST: LT-M RD BRN, HD, SL.

SS: RD BRN, QTZ, SL HD, SBRND-SBANG, SIL NO V P.

CHT FRAG/SS MATRIX, CLR QTZ, V F GR, HD, SIL, SBANG-SBRND.

CHT: PRED LT BL GN, TR PINK, WH, BUFF, FRAG.

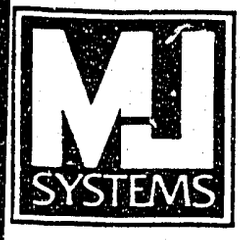
DEN 1130

77.4-80

3080

FTD (DRILLERS DEPTH) 3080 M.
1830 HRS. MARCH 05/89.

SURVEY PLAN



OVERSIZED DOCUMENT FILMED ON 35mm

VERICAL SEISMIC PROFILE REPORT

OTTAWA COPY

Vertical Seismic Profile Report

Shell et al Arrowhead B-41

9211-56-2-1

OTTAWA COPY

GAS LANDS
FEB 7 000

VERTICAL SEISMIC PROFILE REPORT

FOR

SHELL CANADA LTD.

WELL: SHELL ET AL ARROWHEAD B-41
AREA: ARROWHEAD, NORTHWEST TERRITORIES, CANADA
300B416040122450

APRIL, 1989

Data Acquisition

by

DOWNHOLE SEISMIC SERVICES,
A DIVISION OF WESTERN ATLAS CANADA LTD.

Data Processing

by

WESTERN GEOPHYSICAL, A DIVISION
OF WESTERN ATLAS CANADA LTD.

Prepared by: Adam Chow

In the processing and interpretation of the data, Western Atlas Canada employees have relied on experience and have exercised their best judgement. However, since all interpretations are opinions based on inferences from acoustical or other measurements, we cannot, and we do not, guarantee the accuracy or the correctness of any interpretations. As such, we shall not be liable for any loss, cost, damages or expenses resulting from reliance on such interpretation.

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Field Procedure 2

SECTION 2

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SECTION 3

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Time/Depth and Velocity Calculations 6

SECTION 5: FIGURES AND TABLES

Figure 1: Survey Configuration
Figure 2: Nomenclature Chart
Figure 3: Time/Depth Curve
Figure 4: Average/Interval Velocity Curves

SECTION 6: ENCLOSURES

1. Field Observers' Log
2. VSP Intermediate Processing, corridor and full-length stacks (Displays 1-19)

INTRODUCTION

Downhole Seismic Services (DSS) conducted a vertical seismic profile survey for Shell Canada Ltd., in the Shell et al Arrowhead B-41 well located in Northwest Territories, Canada. The wireline service for this survey was provided by Downhole Seismic Serivces. The survey was conducted on March 8, 1989. Field Observers' Logs for this survey are included as Enclosure 1 of this report.

All measured depths are referenced to the Kelly Bushing (K.B.) elevation of 520 meters above sea level. The ground elevation at the wellhead was 512.48 meters. The data consisted of 958 files (14 tapes) and was gathered at 112 depth levels between the depths of 3075 meters and 300 meters (K.B.). At the time of the survey, the well had been drilled to a measured depth of 3075 meters (K.B.).

FIELD PROCEDURE

Downhole Seismic Services (DSS) crew and equipment arrived at the well on March 8, 1989. All equipment was tested on site prior to the survey. DSS employed standard techniques for the VSP survey.

The energy source used was one vibrator. The sweep length was 16 seconds, with a 3 seconds listening period. The phase relationship between the baseplate motion and the generated sweep was 90 degrees. The source was offset at an azimuth of N21.6E at a distance of 48.5 meters. The source elevation was 510.8 meters above sea level. The survey configuration and nomenclature chart are shown in Figures 1 and 2 (Section 5.)

With the start of the survey, the wireline depth sensor was zeroed-in at the Kelly Bushing (K.B.) elevation. The geophone tool was stopped three times going into the borehole to check all equipment performance and was eventually lowered to a depth of 3075 meters below K.B.. Recording of the data commenced at that depth and proceeded as the geophone was raised to shallower depths. The shallowest depth level occupied was 300 meters (K.B.).

At each downhole station, the wireline cable was stopped and the surface controlled, motor driven arm was activated to lock the geophone tool to the borehole wall. An average of 9 sweeps were taken at each depth level, and data were recorded at a 1 msec. sampling rate. The data were correlated in the field yielding a 3 seconds record for each sweep. On completion of recording for a depth level, the wireline cable slack was removed, the locking arm retracted and the tool moved to the next depth level.

During the survey, the downhole geophone tool was firmly clamped to the borehole wall for most levels occupied.

DATA PROCESSING

The digital data was demultiplexed and displayed. All shots per level were edited and summed to produce a stacked digital record arranged according to decreasing depth. First arrival times were then picked.

The summed data was corrected to compensate for amplitude decay due to spherical divergence using an exponential gain function of T**2.00 (where T is the recorded time). A display of the summed and gained data has been included on Enclosure 2. The downgoing waves were then flattened using the first arrival times.

Each trace was cross-correlated with the first trace (selected as the reference trace) using a time window around the first arrival, and the first arrival times were subsequently shifted to ensure maximum coherency of the downgoing waves. A fifteen-point median filter was applied to the total wavefield to pass the flattened downgoing waves. A display of the flattened downgoing waves is included in the back of this report on Enclosure 2. The downgoing waves were subtracted from the total wavefield to provide the upcoming waves.

Individual deconvolution operators were designed using 1000 msec. of the downgoing waveform for each depth level to shape the wavetrain to a spike. These operators were then applied to the corresponding upcoming waves. The deconvolution results were filtered with a 12 - 78 Hz zero phase bandpass filter. A five point median filter was applied to the upwaves. A display of the upwaves after deconvolution is included in the back of this report on Enclosure 2.

A final narrow corridor mute was defined and stacked into one trace. This trace was repeated eight times (Enclosure 2).

A full-length stack was also generated. This involved stacking the whole trace from time zero to three seconds without any mute applied. This trace was also repeated eight times (Enclosure 2). The corridor stack and the full-length stack were then bandpass filtered with 10 - 70 HZ, 10 - 60 HZ and 10 - 50 HZ bandwidth corresponding.

OPERATION PARAMETERS

Well Name:	Shell et al Arrowhead B-41
Well Location:	Northwest Territories, Canada
Kelly Bushing Elevation:	520 meters above sea level
Seismic Datum:	Ground level
Total Depth:	3075 meters (K.B.)
Number of Levels Occupied:	112 levels
Shallowest Geophone Level:	300 meters (K.B.)
Deepest Geophone Level:	3075 meters (K.B.)
Source Type:	(1) Mertz 12
Sweep Length:	16 seconds
Sweep Frequency:	8-80 Hertz, upsweep and linear
Listening Period:	3 seconds
Source Location:	48.5 meters N21.6E from the wellhead
Source Elevation:	510.8 meters above sea level
Seismic Observer:	B. Lambert
Client Representative:	Lamont Brooks

EQUIPMENT SPECIFICATIONS

Recording System	DSS-10A	
	12 data channels	
	4 auxiliary channels	
	SEG-B Format; 1600 BPI	
	1 msec. sampling rate	
	3 sec. record length	
Downhole Tool	Type:	SR-1300-G
	Frequency:	10 Hz
	Preamp Gain:	60 db.
	Weight:	120 lbs.
	Arm Length:	6 in.
Source	Type:	Mertz 12
	Number:	1 Vibrator

TIME/DEPTH AND VELOCITY CALCULATIONS

SHELL CANADA LTD. SHELL ET AL ARROWHEAD B-41

CLIENT SHELL CANADA LTD.
WELL SHELL ET AL ARROWHEAD B-41
AREA ARROWHEAD, NWT, CANADA
CONTRACTOR WESTERN ATLAS INTL
SURVEY DATE MAR 8, 1989
UNITS USED FOR ALL DISTANCE MEASUREMENTS ARE METERS
ALL ELEVATIONS ARE REFERENCED TO SEA LEVEL
ELEVATION OF THE DATUM = 512.5
ELEVATION OF THE KELLY = 520.0
ELEVATION OF THE WELL = 512.5
ELEVATION CORRECTION VELOCITY (VE) (IN UNITS/SEC) = N/A
SOURCE TYPE VIB
GEOPHONE TYPE
DEPTH OF THE WELL = 3070 K.B.
CASING DEPTH = 1054 K.B.
SAMPLE RATE (MSEC/SAMPLE) = 1

SHELL CANADA LTD. SHELL ET AL ARROWHEAD B-41

*** SOURCE POSITIONS ***

LEVEL NUMBER	ELEVATION OF SOURCE (M) (ES)	DEPTH OF SOURCE (M) (DS)	OFFSET FROM WELL (M) (H)	AZIMUTH OF SOURCE (DEGREES) CLOCKWISE FROM NORTH
1	512.5	0.0	48.5	22.0
2	512.5	0.0	48.5	22.0
3	512.5	0.0	48.5	22.0
4	512.5	0.0	48.5	22.0
5	512.5	0.0	48.5	22.0
6	512.5	0.0	48.5	22.0
7	512.5	0.0	48.5	22.0
8	512.5	0.0	48.5	22.0
9	512.5	0.0	48.5	22.0
10	512.5	0.0	48.5	22.0
11	512.5	0.0	48.5	22.0
12	512.5	0.0	48.5	22.0
13	512.5	0.0	48.5	22.0
14	512.5	0.0	48.5	22.0
15	512.5	0.0	48.5	22.0
16	512.5	0.0	48.5	22.0
17	512.5	0.0	48.5	22.0
18	512.5	0.0	48.5	22.0
19	512.5	0.0	48.5	22.0
20	512.5	0.0	48.5	22.0
21	512.5	0.0	48.5	22.0
22	512.5	0.0	48.5	22.0
23	512.5	0.0	48.5	22.0
24	512.5	0.0	48.5	22.0
25	512.5	0.0	48.5	22.0
26	512.5	0.0	48.5	22.0
27	512.5	0.0	48.5	22.0
28	512.5	0.0	48.5	22.0
29	512.5	0.0	48.5	22.0
30	512.5	0.0	48.5	22.0
31	512.5	0.0	48.5	22.0
32	512.5	0.0	48.5	22.0
33	512.5	0.0	48.5	22.0
34	512.5	0.0	48.5	22.0
35	512.5	0.0	48.5	22.0
36	512.5	0.0	48.5	22.0
37	512.5	0.0	48.5	22.0
38	512.5	0.0	48.5	22.0
39	512.5	0.0	48.5	22.0
40	512.5	0.0	48.5	22.0
41	512.5	0.0	48.5	22.0
42	512.5	0.0	48.5	22.0

43	512.	0.0	48.5	22.0
44	512.	0.0	48.5	22.0
45	512.	0.0	48.5	22.0
46	512.	0.0	48.5	22.0
47	512.	0.0	48.5	22.0
48	512.	0.0	48.5	22.0
49	512.	0.0	48.5	22.0
50	512.	0.0	48.5	22.0
51	512.	0.0	48.5	22.0
52	512.	0.0	48.5	22.0
53	512.	0.0	48.5	22.0
54	512.	0.0	48.5	22.0
55	512.	0.0	48.5	22.0
56	512.	0.0	48.5	22.0
57	512.	0.0	48.5	22.0
58	512.	0.0	48.5	22.0
59	512.	0.0	48.5	22.0
60	512.	0.0	48.5	22.0
61	512.	0.0	48.5	22.0
62	512.	0.0	48.5	22.0
63	512.	0.0	48.5	22.0
64	512.	0.0	48.5	22.0
65	512.	0.0	48.5	22.0
66	512.	0.0	48.5	22.0
67	512.	0.0	48.5	22.0
68	512.	0.0	48.5	22.0
69	512.	0.0	48.5	22.0
70	512.	0.0	48.5	22.0
71	512.	0.0	48.5	22.0
72	512.	0.0	48.5	22.0
73	512.	0.0	48.5	22.0
74	512.	0.0	48.5	22.0
75	512.	0.0	48.5	22.0
76	512.	0.0	48.5	22.0
77	512.	0.0	48.5	22.0
78	512.	0.0	48.5	22.0
79	512.	0.0	48.5	22.0
80	512.	0.0	48.5	22.0
81	512.	0.0	48.5	22.0
82	512.	0.0	48.5	22.0
83	512.	0.0	48.5	22.0
84	512.	0.0	48.5	22.0
85	512.	0.0	48.5	22.0
86	512.	0.0	48.5	22.0
87	512.	0.0	48.5	22.0
88	512.	0.0	48.5	22.0
89	512.	0.0	48.5	22.0
90	512.	0.0	48.5	22.0
91	512.	0.0	48.5	22.0
92	512.	0.0	48.5	22.0
93	512.	0.0	48.5	22.0
94	512.	0.0	48.5	22.0
95	512.	0.0	48.5	22.0

96	512.5	0.0	48.5	22.0
97	512.5	0.0	48.5	22.0
98	512.5	0.0	48.5	22.0
99	512.5	0.0	48.5	22.0
100	512.5	0.0	48.5	22.0
101	512.5	0.0	48.5	22.0
102	512.5	0.0	48.5	22.0
103	512.5	0.0	48.5	22.0
104	512.5	0.0	48.5	22.0
105	512.5	0.0	48.5	22.0
106	512.5	0.0	48.5	22.0
107	512.5	0.0	48.5	22.0
108	512.5	0.0	48.5	22.0
109	512.5	0.0	48.5	22.0
110	512.5	0.0	48.5	22.0
111	512.5	0.0	48.5	22.0
112	512.5	0.0	48.5	22.0

SHELL CANADA LTD. SHELL ET AL ARROWHEAD B-41

*** INPUT DATA AND CALCULATIONS ***

UNITS OF DISTANCE = METERS
ELEVATION CORRECTION VELOCITY (VE) = N/A
ELEVATION OF DATUM = 512.5
ALL TIMES ARE ONE-WAY TIMES

LEVEL NUMBER	GEOPHONE DEPTH FROM KELLY (DGM) (M)	RAW PICK TIME (T) (MSEC)	GRADE PICK	UPHOLE TIME (TS) (MSEC)	SRC-REC DIST. PLAN VIEW (M)	TIME FROM SHOT TO DATUM (DELSD/VE) (MSEC)	COS(I)
1	300.	113.5	G	0.	49.	0.	0.987
2	325.	122.0	G	0.	49.	0.	0.989
3	350.	130.5	G	0.	49.	0.	0.990
4	375.	138.6	G	0.	49.	0.	0.991
5	400.	146.9	G	0.	49.	0.	0.992
6	425.	155.3	G	0.	49.	0.	0.993
7	450.	164.1	G	0.	49.	0.	0.994
8	475.	172.5	G	0.	49.	0.	0.995
9	500.	180.7	G	0.	49.	0.	0.995
10	525.	188.5	G	0.	49.	0.	0.996
11	550.	196.9	G	0.	49.	0.	0.996
12	575.	205.5	G	0.	49.	0.	0.996
13	600.	214.5	G	0.	49.	0.	0.996
14	625.	222.6	G	0.	49.	0.	0.997
15	650.	229.8	G	0.	49.	0.	0.997
16	675.	236.0	G	0.	49.	0.	0.997
17	700.	242.4	G	0.	49.	0.	0.997
18	725.	249.0	G	0.	49.	0.	0.998
19	750.	256.5	G	0.	49.	0.	0.998
20	775.	264.4	G	0.	49.	0.	0.998
21	800.	271.6	G	0.	49.	0.	0.998
22	825.	279.3	G	0.	49.	0.	0.998
23	850.	286.9	G	0.	49.	0.	0.998
24	875.	294.7	G	0.	49.	0.	0.998
25	900.	302.3	G	0.	49.	0.	0.998
26	925.	310.5	G	0.	49.	0.	0.999
27	950.	318.5	G	0.	49.	0.	0.999
28	975.	326.0	G	0.	49.	0.	0.999
29	1000.	333.2	G	0.	49.	0.	0.999
30	1025.	340.9	G	0.	49.	0.	0.999
31	1050.	348.5	G	0.	49.	0.	0.999
32	1075.	355.6	G	0.	49.	0.	0.999
33	1100.	362.9	G	0.	49.	0.	0.999
34	1125.	370.2	G	0.	49.	0.	0.999
35	1150.	378.6	G	0.	49.	0.	0.999

36	1175.	386.4	G	0.	49.	0.	0.	0.999
37	1200.	393.9	G	0.	49.	0.	0.	0.999
38	1225.	402.4	G	0.	49.	0.	0.	0.999
39	1250.	410.1	G	0.	49.	0.	0.	0.999
40	1275.	418.1	G	0.	49.	0.	0.	0.999
41	1300.	425.9	G	0.	49.	0.	0.	0.999
42	1325.	433.7	G	0.	49.	0.	0.	0.999
43	1350.	441.4	G	0.	49.	0.	0.	0.999
44	1375.	448.9	G	0.	49.	0.	0.	0.999
45	1400.	455.8	G	0.	49.	0.	0.	0.999
46	1425.	462.8	G	0.	49.	0.	0.	0.999
47	1450.	469.4	G	0.	49.	0.	0.	0.999
48	1475.	476.2	G	0.	49.	0.	0.	0.999
49	1500.	482.5	G	0.	49.	0.	0.	0.999
50	1525.	488.7	G	0.	49.	0.	0.	0.999
51	1550.	495.2	G	0.	49.	0.	0.	0.999
52	1575.	501.9	G	0.	49.	0.	0.	1.000
53	1600.	508.5	G	0.	49.	0.	0.	1.000
54	1625.	515.6	G	0.	49.	0.	0.	1.000
55	1650.	522.3	G	0.	49.	0.	0.	1.000
56	1675.	533.5	G	0.	49.	0.	0.	1.000
57	1700.	536.3	G	0.	49.	0.	0.	1.000
58	1725.	543.6	G	0.	49.	0.	0.	1.000
59	1750.	549.6	G	0.	49.	0.	0.	1.000
60	1775.	556.1	G	0.	49.	0.	0.	1.000
61	1800.	561.6	G	0.	49.	0.	0.	1.000
62	1825.	568.0	G	0.	49.	0.	0.	1.000
63	1850.	573.9	G	0.	49.	0.	0.	1.000
64	1875.	580.1	G	0.	49.	0.	0.	1.000
65	1900.	585.5	G	0.	49.	0.	0.	1.000
66	1925.	591.7	G	0.	49.	0.	0.	1.000
67	1950.	598.4	G	0.	49.	0.	0.	1.000
68	1975.	605.0	G	0.	49.	0.	0.	1.000
69	2000.	611.3	G	0.	49.	0.	0.	1.000
70	2025.	617.3	G	0.	49.	0.	0.	1.000
71	2050.	623.3	G	0.	49.	0.	0.	1.000
72	2075.	629.9	G	0.	49.	0.	0.	1.000
73	2100.	636.3	G	0.	49.	0.	0.	1.000
74	2125.	643.0	G	0.	49.	0.	0.	1.000
75	2150.	649.7	G	0.	49.	0.	0.	1.000
76	2175.	656.4	G	0.	49.	0.	0.	1.000
77	2200.	662.9	G	0.	49.	0.	0.	1.000
78	2225.	669.7	G	0.	49.	0.	0.	1.000
79	2250.	676.1	G	0.	49.	0.	0.	1.000
80	2275.	683.0	G	0.	49.	0.	0.	1.000
81	2300.	689.4	G	0.	49.	0.	0.	1.000
82	2325.	696.0	G	0.	49.	0.	0.	1.000
83	2350.	702.3	G	0.	49.	0.	0.	1.000
84	2375.	709.0	G	0.	49.	0.	0.	1.000
85	2400.	715.4	G	0.	49.	0.	0.	1.000
86	2425.	722.3	G	0.	49.	0.	0.	1.000
87	2450.	728.7	G	0.	49.	0.	0.	1.000
88	2475.	735.3	G	0.	49.	0.	0.	1.000

89	2500.	742.3	G	0.	49.	0.	1.000
90	2525.	749.0	G	0.	49.	0.	1.000
91	2550.	755.0	G	0.	49.	0.	1.000
92	2575.	759.6	G	0.	49.	0.	1.000
93	2600.	763.5	G	0.	49.	0.	1.000
94	2625.	767.3	G	0.	49.	0.	1.000
95	2650.	771.2	G	0.	49.	0.	1.000
96	2675.	775.3	G	0.	49.	0.	1.000
97	2700.	779.4	G	0.	49.	0.	1.000
98	2725.	783.2	G	0.	49.	0.	1.000
99	2750.	787.5	G	0.	49.	0.	1.000
100	2775.	791.2	G	0.	49.	0.	1.000
101	2800.	795.4	G	0.	49.	0.	1.000
102	2825.	798.8	G	0.	49.	0.	1.000
103	2850.	802.7	G	0.	49.	0.	1.000
104	2875.	806.7	G	0.	49.	0.	1.000
105	2900.	810.4	G	0.	49.	0.	1.000
106	2925.	814.1	G	0.	49.	0.	1.000
107	2950.	817.8	G	0.	49.	0.	1.000
108	2975.	821.9	G	0.	49.	0.	1.000
109	3000.	824.8	G	0.	49.	0.	1.000
110	3025.	828.6	G	0.	49.	0.	1.000
111	3050.	832.6	G	0.	49.	0.	1.000
112	3075.	836.2	G	0.	49.	0.	1.000

SHELL CANADA LTD. SHELL ET AL ARROWHEAD B-41

*** RESULTS ***

UNITS OF DISTANCE = METERS
ELEVATION CORRECTION VELOCITY (VE) = 2700
ELEVATION OF DATUM = 512.5
ELEVATION OF K.B. = 520.0
ALL TIMES ARE CORRECTED TO TRUE VERTICAL DEPTH

LVL NO	DEPTH CORR. TO DATUM (DGD) (M)	TIME CORR. TO DATUM (TGD) (MSEC) ONE WAY	TIME CORR. TO DATUM (TGD) (MSEC) TWO WAY	AVERAGE VELOCITY (VA) (M PER SEC)	INTERVAL DEPTH (DELDGD) (M)	INTERVAL TIME (DELTGD) (MSEC)	INTERVAL VELOCITY (VI) (M PER SEC)
1	292.	112.	224.	2612.	292.	112.	2612.
2	317.	121.	241.	2632.	25.	9.	2897.
3	342.	129.	258.	2651.	25.	9.	2904.
4	367.	137.	275.	2674.	25.	8.	3050.
5	392.	146.	292.	2692.	25.	8.	2982.
6	417.	154.	309.	2706.	25.	8.	2951.
7	442.	163.	326.	2713.	25.	9.	2822.
8	467.	172.	343.	2725.	25.	8.	2956.
9	492.	180.	360.	2739.	25.	8.	3030.
10	517.	188.	375.	2757.	25.	8.	3186.
11	542.	196.	392.	2766.	25.	8.	2962.
12	567.	205.	410.	2772.	25.	9.	2895.
13	592.	214.	428.	2771.	25.	9.	2768.
14	617.	222.	444.	2782.	25.	8.	3074.
15	642.	229.	458.	2804.	25.	7.	3457.
16	667.	235.	471.	2836.	25.	6.	4012.

17	692.	242.	484.	2864.
18	717.	248.	497.	2888.
19	742.	256.	512.	2901.
20	767.	264.	528.	2909.
21	792.	271.	542.	2923.
22	817.	279.	558.	2932.
23	842.	286.	573.	2941.
24	867.	294.	588.	2948.
25	892.	302.	604.	2957.
26	917.	310.	620.	2959.
27	942.	318.	636.	2963.
28	967.	326.	651.	2971.
29	992.	333.	666.	2982.
30	1017.	341.	681.	2988.
31	1042.	348.	696.	2995.
32	1067.	355.	710.	3005.
33	1092.	363.	725.	3013.
34	1117.	370.	740.	3021.
35	1142.	378.	757.	3020.
36	1167.	386.	772.	3024.
37	1192.	394.	787.	3030.
38	1217.	402.	804.	3028.
39	1242.	410.	820.	3032.
40	1267.	418.	836.	3034.
41	1292.	426.	851.	3037.
42	1317.	433.	867.	3040.

25.	6.	3889.
25.	7.	3773.
25.	8.	3324.
25.	8.	3157.
25.	7.	3463.
25.	8.	3240.
25.	8.	3283.
25.	8.	3199.
25.	8.	3283.
25.	8.	3044.
25.	8.	3120.
25.	8.	3328.
25.	7.	3467.
25.	8.	3242.
25.	8.	3285.
25.	7.	3516.
25.	7.	3420.
25.	7.	3420.
25.	8.	2974.
25.	8.	3202.
25.	8.	3330.
25.	9.	2939.
25.	8.	3244.
25.	8.	3122.
25.	8.	3203.
25.	8.	3203.
25.	8.	3244.

43	1342.	441.	882.	3043.
44	1367.	449.	897.	3048.
45	1392.	456.	911.	3057.
46	1417.	463.	925.	3065.
47	1442.	469.	938.	3075.
48	1467.	476.	952.	3083.
49	1492.	482.	964.	3095.
50	1517.	488.	977.	3107.
51	1542.	495.	990.	3116.
52	1567.	502.	1003.	3125.
53	1592.	508.	1017.	3133.
54	1617.	515.	1031.	3138.
55	1642.	522.	1044.	3146.
56	1667.	533.	1067.	3127.
57	1692.	536.	1072.	3157.
58	1717.	543.	1087.	3161.
59	1742.	549.	1099.	3172.
60	1767.	556.	1112.	3180.
61	1792.	561.	1123.	3193.
62	1817.	568.	1136.	3201.
63	1842.	574.	1147.	3212.
64	1867.	580.	1160.	3220.
65	1892.	585.	1171.	3233.
66	1917.	592.	1183.	3242.
67	1942.	598.	1196.	3247.
68	1967.	605.	1210.	3253.
69	1992.	611.	1222.	3260.

25.	8.	3331.
25.	7.	3620.
25.	7.	3569.
25.	7.	3785.
25.	7.	3674.
25.	6.	3965.
25.	6.	4029.
25.	7.	3843.
25.	7.	3729.
25.	7.	3785.
25.	7.	3519.
25.	7.	3729.
25.	11.	2232.
25.	3.	8911.
25.	7.	3423.
25.	6.	4164.
25.	7.	3844.
25.	6.	4542.
25.	6.	3904.
25.	6.	4235.
25.	6.	4030.
25.	5.	4627.
25.	6.	4030.
25.	7.	3730.
25.	7.	3786.
25.	6.	3967.

70	2017.	617.	1234.	3269.
71	2042.	623.	1246.	3278.
72	2067.	630.	1259.	3283.
73	2092.	636.	1272.	3289.
74	2117.	643.	1286.	3294.
75	2142.	650.	1299.	3298.
76	2167.	656.	1312.	3303.
77	2192.	663.	1325.	3308.
78	2217.	670.	1339.	3312.
79	2242.	676.	1352.	3318.
80	2267.	683.	1366.	3321.
81	2292.	689.	1378.	3326.
82	2317.	696.	1392.	3330.
83	2342.	702.	1404.	3336.
84	2367.	709.	1418.	3340.
85	2392.	715.	1431.	3345.
86	2417.	722.	1444.	3348.
87	2442.	729.	1457.	3352.
88	2467.	735.	1470.	3356.
89	2492.	742.	1484.	3358.
90	2517.	749.	1498.	3362.
91	2542.	755.	1510.	3368.
92	2567.	759.	1519.	3381.
93	2592.	763.	1527.	3396.
94	2617.	767.	1534.	3412.
95	2642.	771.	1542.	3427.

25.	6.	4165.
25.	6.	4165.
25.	7.	3786.
25.	6.	3905.
25.	7.	3730.
25.	7.	3730.
25.	7.	3730.
25.	7.	3845.
25.	7.	3676.
25.	6.	3905.
25.	7.	3622.
25.	6.	3905.
25.	7.	3787.
25.	6.	3967.
25.	7.	3730.
25.	6.	3905.
25.	7.	3622.
25.	6.	3905.
25.	7.	3787.
25.	7.	3571.
25.	7.	3731.
25.	6.	4165.
25.	5.	5435.
25.	4.	6407.
25.	4.	6575.
25.	4.	6407.
25.	4.	6095.

96	2667.	775.	1550.	3441.
97	2692.	779.	1559.	3455.
98	2717.	783.	1566.	3470.
99	2742.	787.	1575.	3483.
100	2767.	791.	1582.	3498.
101	2792.	795.	1591.	3511.
102	2817.	799.	1597.	3528.
103	2842.	803.	1605.	3542.
104	2867.	807.	1613.	3555.
105	2892.	810.	1621.	3570.
106	2917.	814.	1628.	3584.
107	2942.	818.	1635.	3599.
108	2967.	822.	1644.	3611.
109	2992.	825.	1649.	3629.
110	3017.	828.	1657.	3642.
111	3042.	832.	1665.	3655.
112	3067.	836.	1672.	3669.

25.	4.	6095.
25.	4.	6576.
25.	4.	5812.
25.	4.	6754.
25.	4.	5950.
25.	3.	7349.
25.	4.	6408.
25.	4.	6248.
25.	4.	6754.
25.	4.	6754.
25.	4.	6755.
25.	4.	6095.
25.	3.	8617.
25.	4.	6577.
25.	4.	6248.
25.	4.	6942.

SHELL CANADA LTD. SHELL ET AL ARROWHEAD B-41

*** INPUT VALUES ***

DEPTH (DGD) (M)	TIME 1 WAY (TGD) (MS)	TIME 2 WAY (MS)	AV.VELOCITY (M/SEC)	INT.VELOCITY (M/SEC)
292.	112.	224.	2612.	2612.
317.	121.	241.	2632.	2897.
342.	129.	258.	2651.	2904.
367.	137.	275.	2674.	3050.
392.	146.	292.	2692.	2982.
417.	154.	309.	2706.	2951.
442.	163.	326.	2713.	2822.
467.	172.	343.	2725.	2956.
492.	180.	360.	2739.	3030.
517.	188.	375.	2757.	3186.
542.	196.	392.	2766.	2962.
567.	205.	410.	2772.	2895.
592.	214.	428.	2771.	2768.
617.	222.	444.	2782.	3074.
642.	229.	458.	2804.	3457.
667.	235.	471.	2836.	4012.
692.	242.	484.	2864.	3889.
717.	248.	497.	2888.	3773.
742.	256.	512.	2901.	3324.
767.	264.	528.	2909.	3157.
792.	271.	542.	2923.	3463.
817.	279.	558.	2932.	3240.
842.	286.	573.	2941.	3283.
867.	294.	588.	2948.	3199.
892.	302.	604.	2957.	3283.
917.	310.	620.	2959.	3044.
942.	318.	636.	2963.	3120.
967.	326.	651.	2971.	3328.
992.	333.	666.	2982.	3467.
1017.	341.	681.	2988.	3242.
1042.	348.	696.	2995.	3285.
1067.	355.	710.	3005.	3516.
1092.	363.	725.	3013.	3420.
1117.	370.	740.	3021.	3420.
1142.	378.	757.	3020.	2974.
1167.	386.	772.	3024.	3202.
1192.	394.	787.	3030.	3330.
1217.	402.	804.	3028.	2939.
1242.	410.	820.	3032.	3244.
1267.	418.	836.	3034.	3122.
1292.	426.	851.	3037.	3203.

1317.	433.	867.	3040.	3203.
1342.	441.	882.	3043.	3244.
1367.	449.	897.	3048.	3331.
1392.	456.	911.	3057.	3620.
1417.	463.	925.	3065.	3569.
1442.	469.	938.	3075.	3785.
1467.	476.	952.	3083.	3674.
1492.	482.	964.	3095.	3965.
1517.	488.	977.	3107.	4029.
1542.	495.	990.	3116.	3843.
1567.	502.	1003.	3125.	3729.
1592.	508.	1017.	3133.	3785.
1617.	515.	1031.	3138.	3519.
1642.	522.	1044.	3146.	3729.
1667.	533.	1067.	3127.	2232.
1692.	536.	1072.	3157.	8911.
1717.	543.	1087.	3161.	3423.
1742.	549.	1099.	3172.	4164.
1767.	556.	1112.	3180.	3844.
1792.	561.	1123.	3193.	4542.
1817.	568.	1136.	3201.	3904.
1842.	574.	1147.	3212.	4235.
1867.	580.	1160.	3220.	4030.
1892.	585.	1171.	3233.	4627.
1917.	592.	1183.	3242.	4030.
1942.	598.	1196.	3247.	3730.
1967.	605.	1210.	3253.	3786.
1992.	611.	1222.	3260.	3967.
2017.	617.	1234.	3269.	4165.
2042.	623.	1246.	3278.	4165.
2067.	630.	1259.	3283.	3786.
2092.	636.	1272.	3289.	3905.
2117.	643.	1286.	3294.	3730.
2142.	650.	1299.	3298.	3730.
2167.	656.	1312.	3303.	3730.
2192.	663.	1325.	3308.	3845.
2217.	670.	1339.	3312.	3676.
2242.	676.	1352.	3318.	3905.
2267.	683.	1366.	3321.	3622.
2292.	689.	1378.	3326.	3905.
2317.	696.	1392.	3330.	3787.
2342.	702.	1404.	3336.	3967.
2367.	709.	1418.	3340.	3730.
2392.	715.	1431.	3345.	3905.
2417.	722.	1444.	3348.	3622.
2442.	729.	1457.	3352.	3905.
2467.	735.	1470.	3356.	3787.
2492.	742.	1484.	3358.	3571.
2517.	749.	1498.	3362.	3731.
2542.	755.	1510.	3368.	4165.
2567.	759.	1519.	3381.	5433.
2592.	763.	1527.	3396.	6407.
2617.	767.	1534.	3412.	6575.

2642.	771.	1542.	3427.	6407.
2667.	775.	1550.	3441.	6095.
2692.	779.	1559.	3455.	6095.
2717.	783.	1566.	3470.	6576.
2742.	787.	1575.	3483.	5812.
2767.	791.	1582.	3498.	6754.
2792.	795.	1591.	3511.	5950.
2817.	799.	1597.	3528.	7349.
2842.	803.	1605.	3542.	6408.
2867.	807.	1613.	3555.	6248.
2892.	810.	1621.	3570.	6754.
2917.	814.	1628.	3584.	6754.
2942.	818.	1635.	3599.	6755.
2967.	822.	1644.	3611.	6095.
2992.	825.	1649.	3629.	8617.
3017.	828.	1657.	3642.	6577.
3042.	832.	1665.	3655.	6248.
3067.	836.	1672.	3669.	6942.

SHELL CANADA LTD. SHELL ET AL ARROWHEAD B-41

*** VALUES INTERPOLATED EVERY 20 M. BELOW DATUM ***

DEPTH (DGD) (M)	TIME 1 WAY (TGD) (MS)	TIME 2 WAY (MS)	AV.VELOCITY (M/SEC)	INT.VELOCITY (M/SEC)
300.	115.	229.	2619.	2897.
320.	121.	243.	2634.	2904.
340.	128.	257.	2649.	2904.
360.	135.	270.	2668.	3050.
380.	142.	283.	2683.	2982.
400.	148.	297.	2697.	2951.
420.	155.	310.	2707.	2822.
440.	162.	324.	2712.	2822.
460.	169.	338.	2721.	2956.
480.	176.	351.	2732.	3030.
500.	182.	364.	2744.	3186.
520.	189.	377.	2758.	2962.
540.	195.	391.	2765.	2962.
560.	202.	404.	2770.	2895.
580.	209.	419.	2771.	2768.
600.	216.	432.	2775.	3074.
620.	223.	445.	2785.	3457.
640.	228.	457.	2802.	3457.
660.	234.	467.	2826.	4012.
680.	239.	477.	2850.	3889.
700.	244.	488.	2871.	3773.
720.	249.	498.	2889.	3324.
740.	255.	510.	2900.	3324.
760.	262.	523.	2906.	3157.
780.	267.	535.	2916.	3463.
800.	273.	547.	2926.	3240.
820.	280.	559.	2933.	3283.
840.	286.	571.	2940.	3283.
860.	292.	584.	2946.	3199.
880.	298.	596.	2952.	3283.
900.	304.	609.	2957.	3044.
920.	311.	622.	2959.	3120.
940.	317.	635.	2963	3120.
960.	323.	647.	2969.	3328.
980.	329.	658.	2977.	3467.
1000.	335.	670.	2984.	3242.
1020.	341.	683.	2989.	3285.
1040.	347.	695.	2994.	3285.
1060.	353.	706.	3002.	3516.
1080.	359.	718.	3009.	3420.
1100.	365.	729.	3016.	3420.
1120.	371.	741.	3021.	2974.
1140.	377.	755.	3020.	2974.

DEPTH (DGD) (M)	TIME 1 WAY (TGD) (MS)	TIME 2 WAY (MS)	AV.VELOCITY (M/SEC)	INT.VELOCITY (M/SEC)
1160.	384.	767.	3023.	3202.
1180.	390.	780.	3027.	3330.
1200.	396.	792.	3029.	2939.
1220.	403.	806.	3028.	3244.
1240.	409.	818.	3032.	3244.
1260.	415.	831.	3033.	3122.
1280.	422.	843.	3035.	3203.
1300.	428.	856.	3038.	3203.
1320.	434.	868.	3040.	3244.
1340.	440.	881.	3043.	3244.
1360.	446.	893.	3047.	3331.
1380.	452.	904.	3053.	3620.
1400.	458.	915.	3059.	3569.
1420.	463.	926.	3066.	3785.
1440.	468.	937.	3074.	3785.
1460.	474.	948.	3081.	3674.
1480.	479.	958.	3089.	3965.
1500.	484.	968.	3098.	4029.
1520.	489.	978.	3108.	3843.
1540.	494.	989.	3115.	3843.
1560.	500.	999.	3122.	3729.
1580.	505.	1010.	3129.	3785.
1600.	510.	1021.	3135.	3519.
1620.	516.	1032.	3139.	3729.
1640.	521.	1043.	3145.	3729.
1660.	530.	1060.	3133.	2232.
1680.	535.	1069.	3142.	8911.
1700.	538.	1077.	3158.	3423.
1720.	544.	1088.	3162.	4164.
1740.	549.	1098.	3171.	4164.
1760.	554.	1108.	3177.	3844.
1780.	559.	1117.	3186.	4542.
1800.	563.	1127.	3195.	3904.
1820.	568.	1137.	3202.	4235.
1840.	573.	1146.	3211.	4235.
1860.	578.	1156.	3218.	4030.
1880.	583.	1165.	3227.	4627.
1900.	587.	1174.	3236.	4030.
1920.	592.	1184.	3242.	3730.
1940.	598.	1195.	3247.	3730.
1960.	603.	1206.	3251.	3786.
1980.	608.	1216.	3257.	3967.
2000.	613.	1226.	3263.	4165.
2020.	618.	1235.	3270.	4165.
2040.	623.	1245.	3277.	4165.
2060.	628.	1256.	3282.	3786.
2080.	633.	1266.	3286.	3905.
2100.	638.	1276.	3291.	3730.

DEPTH (DGD) (M)	TIME 1 WAY (TGD) (MS)	TIME 2 WAY (MS)	AV.VELOCITY (M/SEC)	INT.VELOCITY (M/SEC)
2120.	644.	1287.	3294.	3730.
2140.	649.	1298.	3298.	3730.
2160.	654.	1308.	3302.	3730.
2180.	659.	1319.	3306.	3845.
2200.	665.	1330.	3309.	3676.
2220.	670.	1340.	3313.	3905.
2240.	675.	1351.	3317.	3905.
2260.	681.	1362.	3320.	3622.
2280.	686.	1372.	3323.	3905.
2300.	691.	1382.	3327.	3787.
2320.	696.	1393.	3331.	3967.
2340.	702.	1403.	3336.	3967.
2360.	707.	1414.	3339.	3730.
2380.	712.	1424.	3342.	3905.
2400.	717.	1435.	3346.	3622.
2420.	723.	1446.	3348.	3905.
2440.	728.	1456.	3352.	3905.
2460.	733.	1466.	3355.	3787.
2480.	739.	1477.	3357.	3571.
2500.	744.	1488.	3359.	3731.
2520.	749.	1499.	3362.	4165.
2540.	754.	1509.	3368.	4165.
2560.	758.	1516.	3377.	5433.
2580.	761.	1523.	3388.	6407.
2600.	765.	1529.	3401.	6575.
2620.	768.	1535.	3413.	6407.
2640.	771.	1541.	3426.	6407.
2660.	774.	1548.	3437.	6095.
2680.	777.	1554.	3448.	6095.
2700.	780.	1561.	3460.	6576.
2720.	784.	1567.	3472.	5812.
2740.	787.	1574.	3482.	5812.
2760.	790.	1580.	3494.	6754.
2780.	793.	1586.	3505.	5950.
2800.	796.	1593.	3516.	7349.
2820.	799.	1598.	3529.	6408.
2840.	802.	1604.	3540.	6408.
2860.	805.	1611.	3551.	6248.
2880.	808.	1617.	3562.	6754.
2900.	811.	1623.	3574.	6754.
2920.	814.	1629.	3586.	6755.
2940.	817.	1635.	3597.	6755.
2960.	821.	1641.	3607.	6095.
2980.	823.	1646.	3620.	8617.
3000.	826.	1652.	3633.	6577.
3020.	829.	1658.	3643.	6248.
3040.	832.	1664.	3653.	6248.
3060.	835.	1670.	3665.	6942.

SHELL CANADA LTD. SHELL ET AL ARROWHEAD B-41

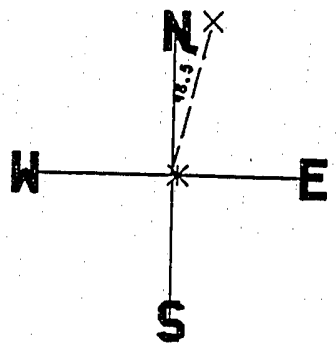
*** VALUES INTERPOLATED EVERY 10 MS. BELOW DATUM ***

DEPTH (DGD) (M)	TIME 1 WAY (TGD) (MS)	TIME 2 WAY (MS)	AV.VELOCITY (M/SEC)	INT.VELOCITY (M/SEC)
287.	110.	220.	2612.	2612.
316.	120.	240.	2631.	2897.
345.	130.	260.	2653.	3050.
375.	140.	280.	2680.	2982.
405.	150.	300.	2699.	2951.
434.	160.	320.	2710.	2822.
463.	170.	340.	2722.	2956.
493.	180.	360.	2739.	3186.
524.	190.	380.	2760.	2962.
554.	200.	400.	2769.	2895.
582.	210.	420.	2771.	2768.
612.	220.	440.	2780.	3074.
646.	230.	460.	2808.	4012.
685.	240.	480.	2856.	3889.
723.	250.	500.	2891.	3324.
755.	260.	520.	2905.	3157.
789.	270.	540.	2921.	3463.
821.	280.	560.	2934.	3283.
854.	290.	580.	2945.	3199.
886.	300.	600.	2955.	3283.
917.	310.	620.	2959.	3044.
949.	320.	640.	2965.	3328.
983.	330.	660.	2978.	3467.
1016.	340.	680.	2988.	3242.
1049.	350.	700.	2997.	3516.
1084.	360.	720.	3011.	3420.
1118.	370.	740.	3021.	2974.
1148.	380.	760.	3021.	3202.
1181.	390.	780.	3027.	3330.
1211.	400.	800.	3028.	2939.
1243.	410.	820.	3032.	3122.
1275.	420.	840.	3035.	3203.
1307.	430.	860.	3039.	3203.
1339.	440.	880.	3043.	3244.
1372.	450.	900.	3050.	3620.
1408.	460.	920.	3062.	3569.
1446.	470.	940.	3076.	3674.
1484.	480.	960.	3091.	3965.
1523.	490.	980.	3109.	3843.
1561.	500.	1000.	3123.	3729.
1599.	510.	1020.	3134.	3519.
1635.	520.	1040.	3144.	3729.

1660.	530.	1060.	3132.	2232.
1706.	540.	1080.	3159.	3423.
1745.	550.	1100.	3172.	3844.
1786.	560.	1120.	3190.	4542.
1827.	570.	1140.	3205.	4235.
1868.	580.	1160.	3221.	4627.
1911.	590.	1180.	3240.	4030.
1949.	600.	1200.	3249.	3786.
1988.	610.	1220.	3259.	3967.
2029.	620.	1240.	3273.	4165.
2069.	630.	1260.	3283.	3905.
2107.	640.	1280.	3292.	3730.
2144.	650.	1300.	3299.	3730.
2182.	660.	1320.	3306.	3845.
2219.	670.	1340.	3312.	3905.
2257.	680.	1360.	3319.	3622.
2295.	690.	1380.	3327.	3787.
2334.	700.	1400.	3334.	3967.
2372.	710.	1420.	3341.	3905.
2410.	720.	1440.	3347.	3622.
2448.	730.	1460.	3353.	3787.
2485.	740.	1480.	3358.	3571.
2522.	750.	1500.	3363.	4165.
2571.	760.	1520.	3383.	6407.
2636.	770.	1540.	3423.	6407.
2697.	780.	1560.	3458.	6576.
2760.	790.	1580.	3494.	6754.
2826.	800.	1600.	3532.	6408.
2891.	810.	1620.	3569.	6754.
2957.	820.	1640.	3606.	6095.
3027.	830.	1660.	3647.	6248.
3095.	840.	1680.	3684.	6942.
3164.	850.	1700.	3722.	6942.

VERTICAL SEISMIC PROFILE REPORT
SHELL CANADA LTD.
WELL: SHELL ET AL ARROWHEAD B-41

SURVEY CONFIGURATION



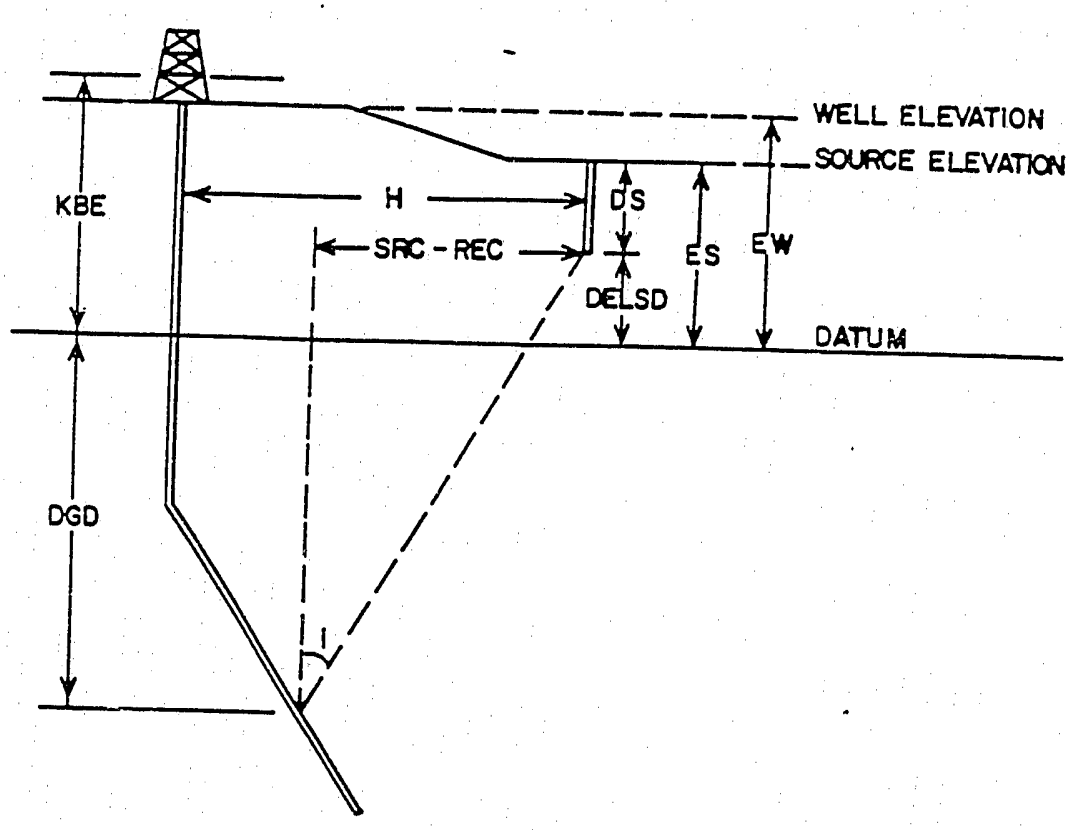
NOT TO SCALE

WELLHEAD: ✳
SOURCE: ×

ZERO-OFFSET VSP:
SOURCE LOCATION: 48.5 M N21.6E FROM THE WELLHEAD
SOURCE ELEVATION: 510.8 M ABOVE SEA LEVEL
GROUND ELEVATION: 512.48 M ABOVE SEA LEVEL
K.B. ELEVATION: 520 M ABOVE SEA LEVEL

FIGURE 1

NOMENCLATURE CHART



KBE = Kelly Bushing (K.B.) elevation
EW = Well elevation
ES = Source elevation
DS = Source depth
H = Source—well head horizontal distance.
DELSD = ES-DS
DGM = Geophone depth (measured from K.B. along the borehole)
DGD = Geophone vertical depth (measured from DATUM).
TGD = Time corrected to DATUM.
VE = Elevation correction velocity.
SRC-REC = Source-receiver horizontal distance
DELDGD = Interval vertical depth.
DELDGT = Interval time.

$$\text{Cos } i = (DGD + DELSD) \,/\sqrt{(SRC\text{-}REC)^2 + (DGD + DELSD)^2}$$

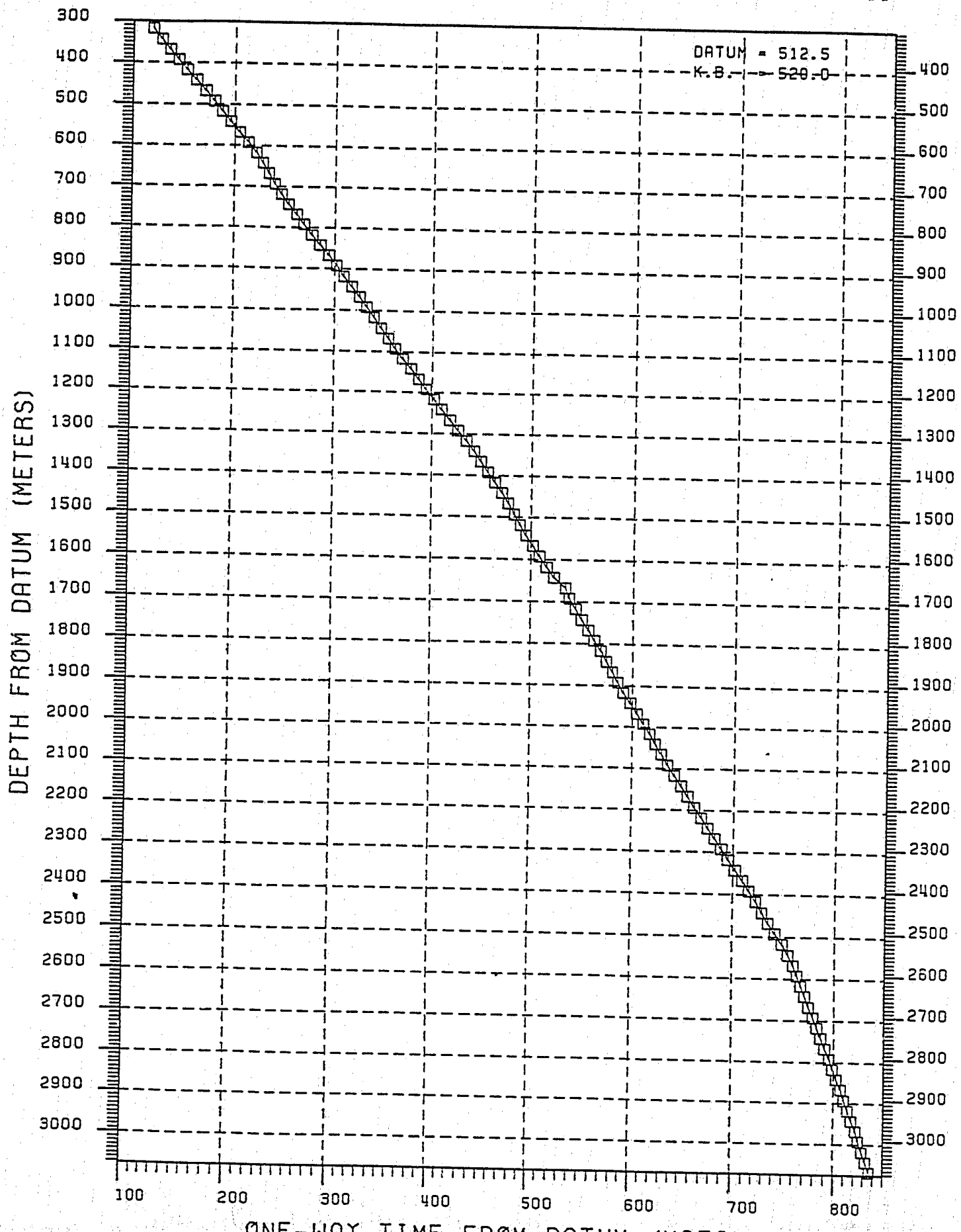
Western Atlas International

DSS

FIGURE 2

TIME-DEPTH CHART

SHELL CANADA LTD. SHELL ET AL ARROWHEAD B-41

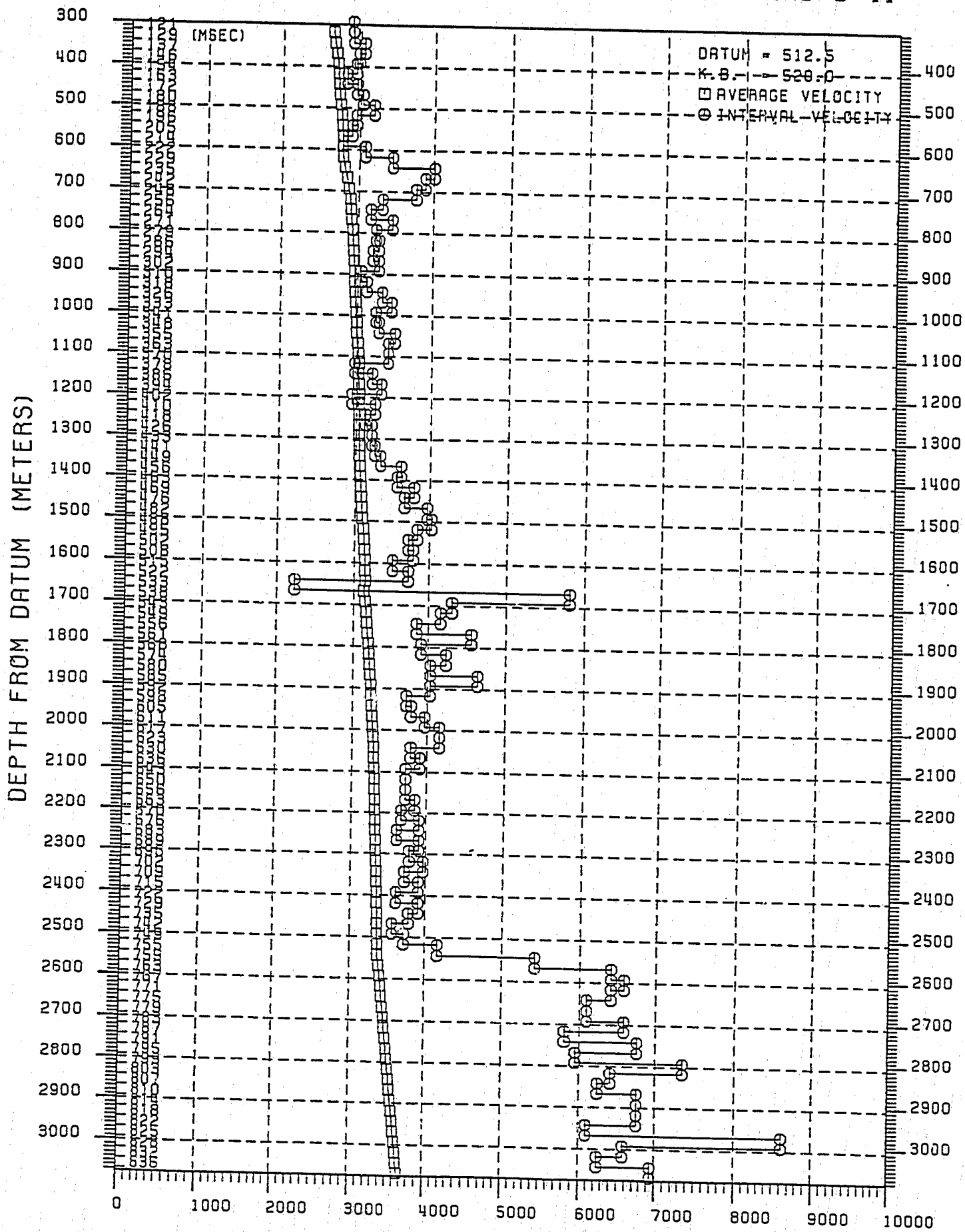


WESTERN GEOPHYSICAL

-FIGURE 3-

VELOCITY-DEPTH CHART

SHELL CANADA LTD. SHELL ET AL ARROWHEAD B-41

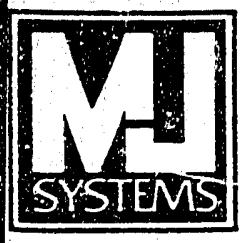


WESTERN GEOPHYSICAL

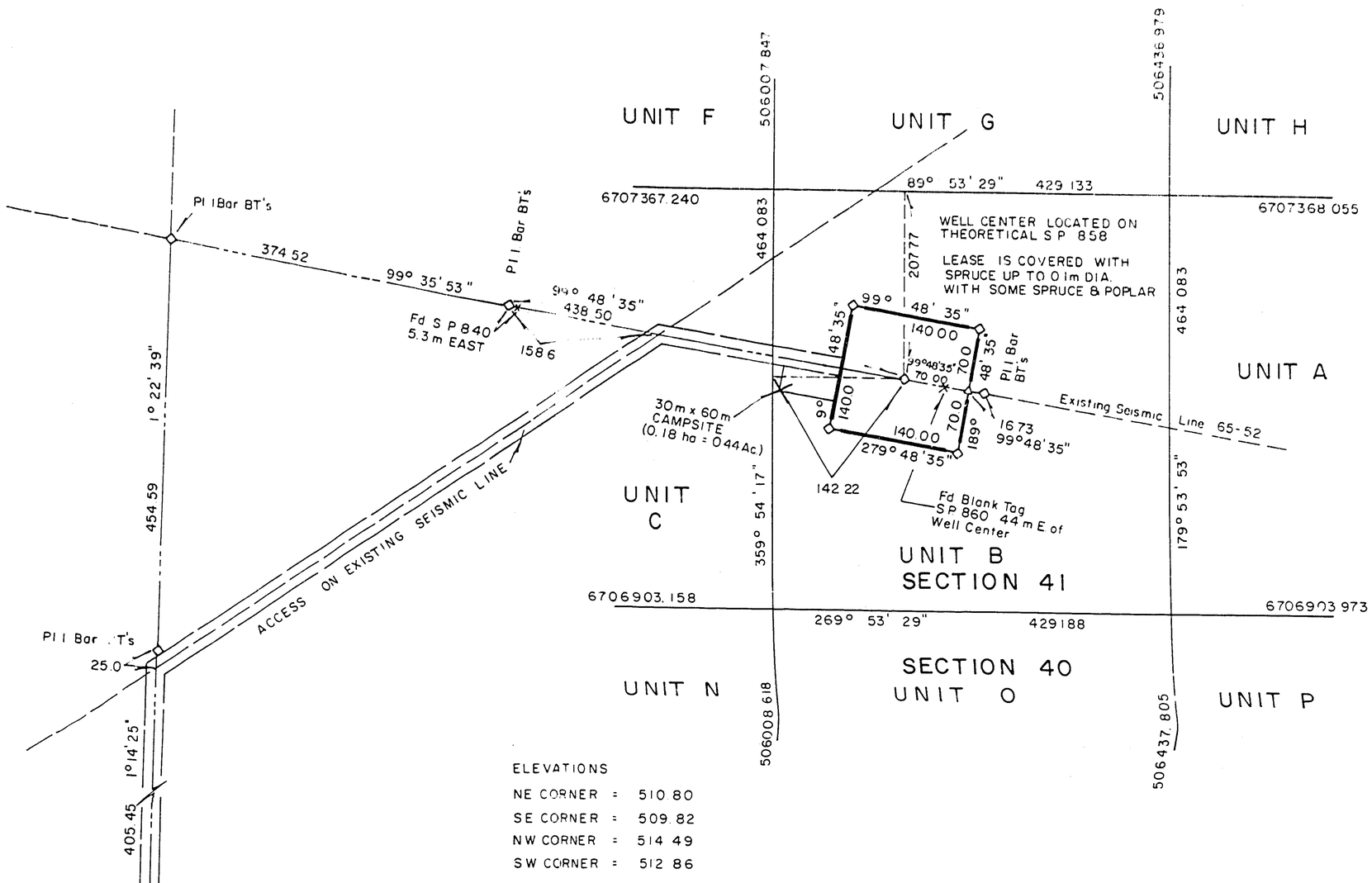
-FIGURE 4-



OVERSIZED DOCUMENT FILMED ON 35mm



OVERSIZED DOCUMENT FILMED ON 35mm



ELEVATIONS

NE CORNER	= 510.80
SE CORNER	= 509.82
NW CORNER	= 514.49
SW CORNER	= 512.86

N.T.S. MAP SHEET: 95 B/10	METRIC	NORTHWEST TERRITORIES

SHELL CANADA LIMITED

PRELIMINARY SKETCH SHOWING WELL LOCATION

SHELL ET AL ARROWHEAD B-41

UNIT B, SECTION 41, GRID AREA 60° 40', 122° 45'

SHELL CANADA LIMITED

CERTIFIED CORRECT:
THIS 5th DAY OF DECEMBER, A.D. 1988.
CANADA LANDS SURVEYOR

ELEVATION	GEOGRAPHIC CO-ORD'S.	U.T.M. CO-ORDINATES
ON GROUND AT WELLHEAD : 512.38	NORTH LATITUDE 60° 30' 08.4931" (60.50235919) WEST LONGITUDE 122° 53' 16.9292" (122.88803589)	NORTHING 6 707 159.743 EASTING 306 150.415 CO-ORDINATES ARE COMPUTED FOR ZONE 10, CENTRAL MERIDIAN 123 °W.

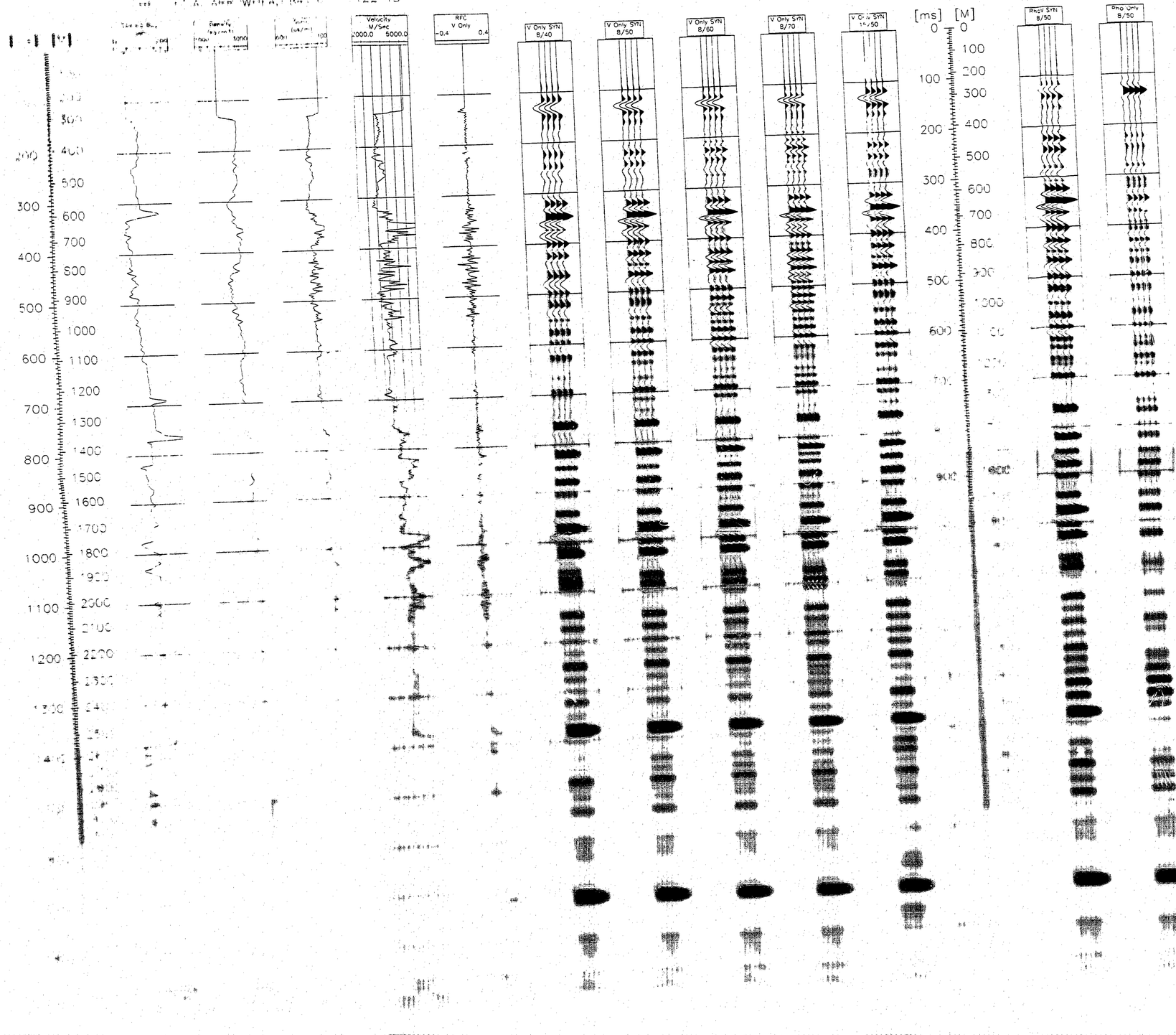
LEGEND	AREAS REQUIRED	
Survey Monument found ●	WELLSITE = 4.843 Acres 1.960 ha.	H I W SURVEYS LTD.
Survey Monument placed ◇	CAMPSITE = — Acres — ha.	P.O. BOX 1409, YELLOWKNIFE, X1A 2P1 NORTHWEST TERRITORIES
Traverse Station △	FUEL SITE = — Acres — ha.	
SCALE 1:5000	TOTAL = 4.843 Acres 1.960 ha.	FILE NO. 88297 DATE: DEC.5/88. ck'd

931 R

8451 0

Butterworth Filters, orders 4 and 12.

SHELL ET AL ARROWHEAD B41 60 40 122 45



SHELL CANADA LTD

SHELL CENTRE | Explor. Dept. – Frontier District

PLASMA

SYNTHETICS

SHELL ET AL ARROWHEAD

B41 60 40 122 45

Author: ZINKHAN

Report no: INIT

Encl.

Date: 12-DEC-1989

Draw.no: SYNTHETIC

SCALE 7.5 in/second

1989

CONTINUED
ON NEXT
FRAME

SHELL ET AL ARROWHEAD B-41

300B416040122450

ZERO-OFFSET VSP

A000VV2741

SHELL CANADA LIMITED.

AREA : ARROWHEAD

SHOT BY DOWNHOLE SEISMIC SERVICES

PROCESSED BY WESTERN GEOPHYSICAL CANADA APRIL 1989

ACQUISITION INFORMATION

CABLE

KB ELEVATION AT WELLHEAD	520 METERS
GROUND ELEVATION AT WELLHEAD	512.48 METERS
MIN DEPTH (KB)	300 METERS
MAX DEPTH (KB)	3,075 METERS

SOURCE

ENERGY SOURCE	1 VIBRATOR
TYPE	WESTZ 12
SWEEP FREQUENCY	8-80 HERTZ
UP/DOWN SWEEP	UP, LINEAR
SOURCE ELEVATION	510.8 METERS
SOURCE OFFSET FROM WELLHEAD	48.5 METERS
SOURCE AZIMUTH FROM WELLHEAD	N21.6E

INSTRUMENTS

RECORDING SYSTEM	DSS-10A
SAMPLING INTERVAL	1 MS
RECORD LENGTH	3 SECONDS
SWEEP LENGTH	10 SECONDS
FIELD TAPE FORMAT	SEG B
DOWNHOLE TOOL	SR-1300-G
DOWNHOLE RECEIVER FREQUENCY	10 HZ
DOWNHOLE RECEIVER PREAMP GAIN	60 DB

PROCESSING SEQUENCE

1. DEMULTIPLEX/EDIT/SUM/PICK FIRST ARRIVALS
2. APPLY SPHERICAL DIVERGENCE CORRECTION (T**2.00)
3. WAVEFIELD SEPARATION WITH 15 POINT MEDIAN FILTER
4. DCON OPERATOR DESIGNED USING 1000 MSEC. OF DOWNWAVES, WITH 2.5% WHITE NOISE TO SHAPE WAVETRAIN TO A SPIKE
5. DCON OPERATOR APPLIED TO UPWAVES
6. 5 POINT MEDIAN FILTER APPLIED TO UPWAVES
7. 10-78 HZ (18.75 DB/OCT) BANDPASS FILTER
8. VSP CORRIDOR STACK

COMMENTS

REFERENCE DATUM IS GROUND LEVEL

DISPLAY CONVENTION

NORMAL POLARITY: PEAK = NEGATIVE REFLECTION COEFFICIENT

RELATIVE AMPLITUDE PRESERVED

DISPLAY 1 RAW DATA
DISPLAY 2 TOTAL WAVEFIELD WITH T-FUNCTION
DISPLAY 3 DOWNWAVES AFTER SEPARATION
DISPLAY 4 DIFFERENCE SECTION AFTER SEPARATION
DISPLAY 5 DOWNWAVES AFTER DECONVOLUTION
DISPLAY 6 UPWAVES AFTER DECONVOLUTION
DISPLAY 7 CORRIDOR WHITE
DISPLAY 8 CORRIDOR STACK, NORMAL (10-70 HZ)
DISPLAY 9 CORRIDOR STACK, REVERSE (10-70 HZ)
DISPLAY 10 CORRIDOR STACK, NORMAL (10-60 HZ)
DISPLAY 11 CORRIDOR STACK, REVERSE (10-60 HZ)
DISPLAY 12 CORRIDOR STACK, NORMAL (10-50 HZ)
DISPLAY 13 CORRIDOR STACK, REVERSE (10-50 HZ)
DISPLAY 14 FULL-LENGTH STACK, NORMAL (10-70 HZ)
DISPLAY 15 FULL-LENGTH STACK, REVERSE (10-70 HZ)
DISPLAY 16 FULL-LENGTH STACK, NORMAL (10-60 HZ)
DISPLAY 17 FULL-LENGTH STACK, REVERSE (10-60 HZ)
DISPLAY 18 FULL-LENGTH STACK, NORMAL (10-50 HZ)
DISPLAY 19 FULL-LENGTH STACK, REVERSE (10-50 HZ)

HORIZONTAL SCALE	10 TRACES PER INCH
VERTICAL SCALE	7.5 INCHES PER SECOND

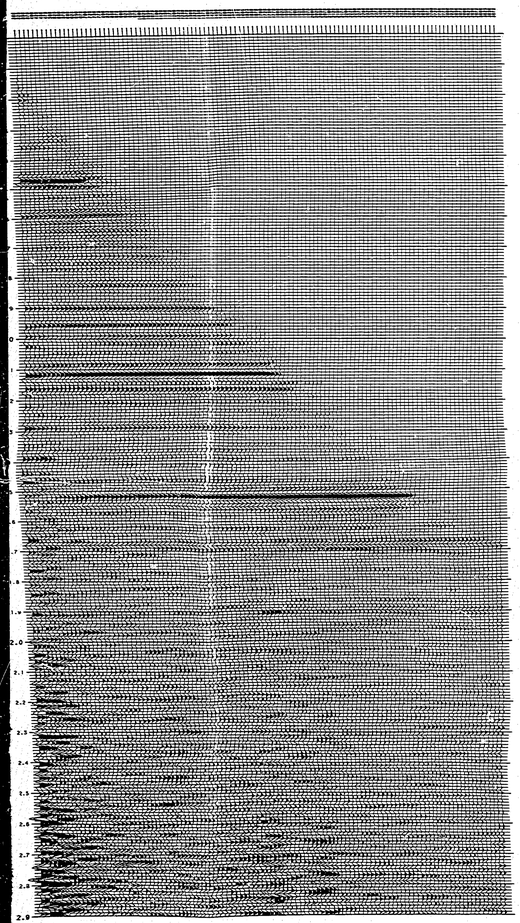
RAW DATA

GEOMETRICALLY COMPENSATED

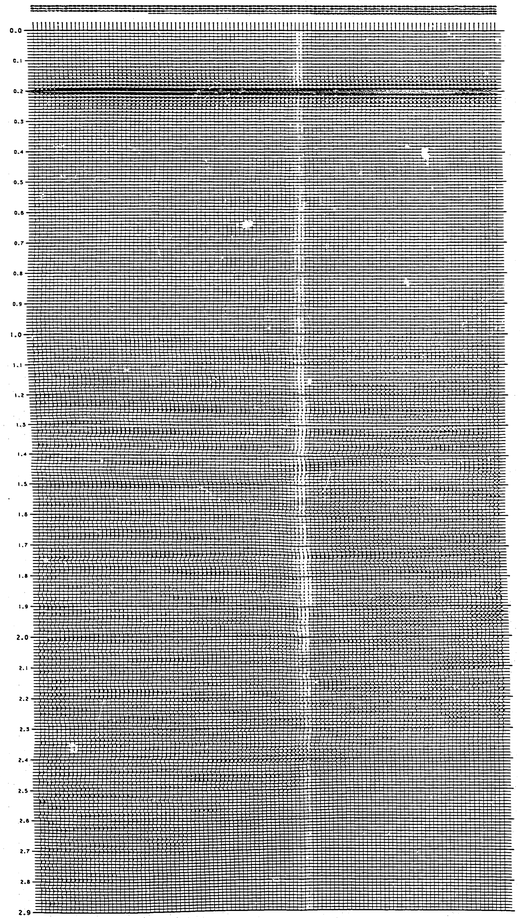
ALIGNED DOWNWAVES

UPWAVES (IN TWO-WAY TIME)

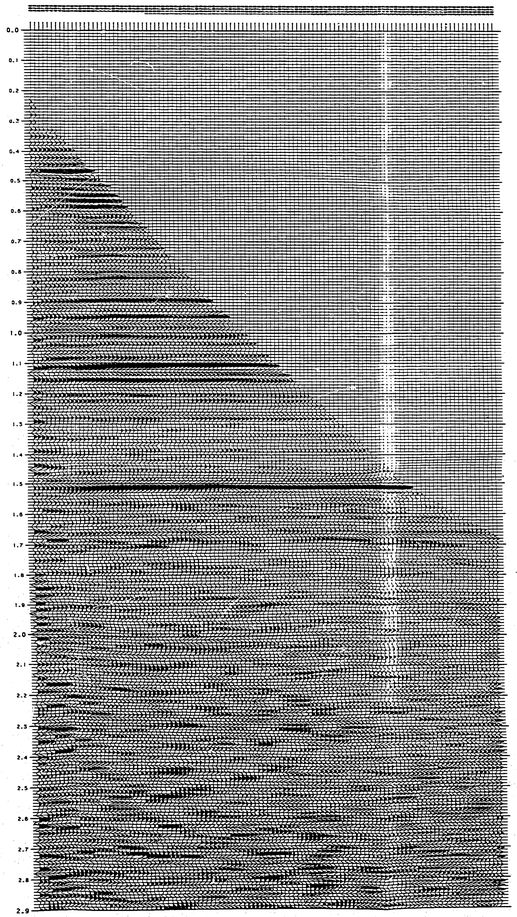
UPWAVES
(IN TWO-WAY TIME)



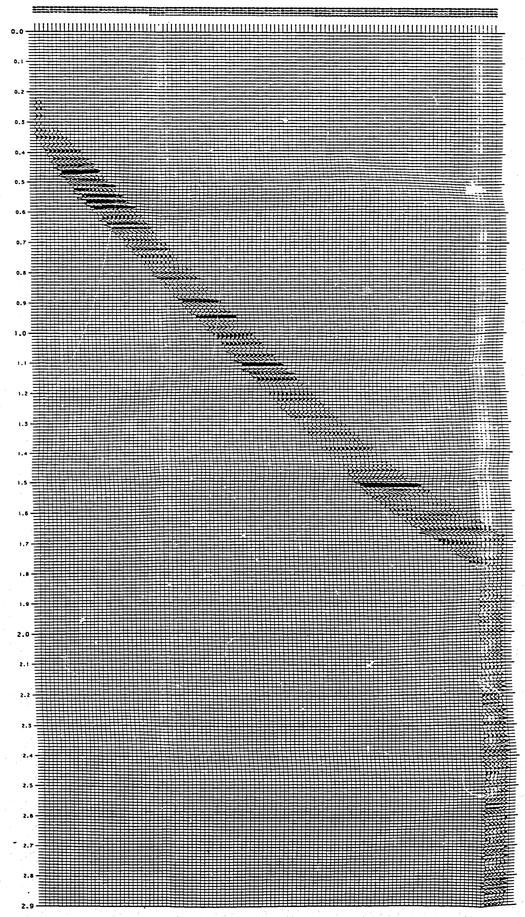
DECONVOLVED
ALIGNED DOWNWAVES



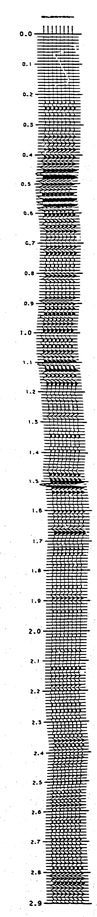
DECONVOLVED
UPWAVES
(IN TWO-WAY TIME)



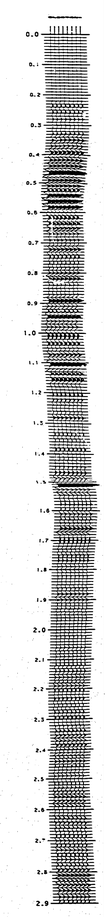
CORRIDOR MUTE
(IN TWO-WAY TIME)



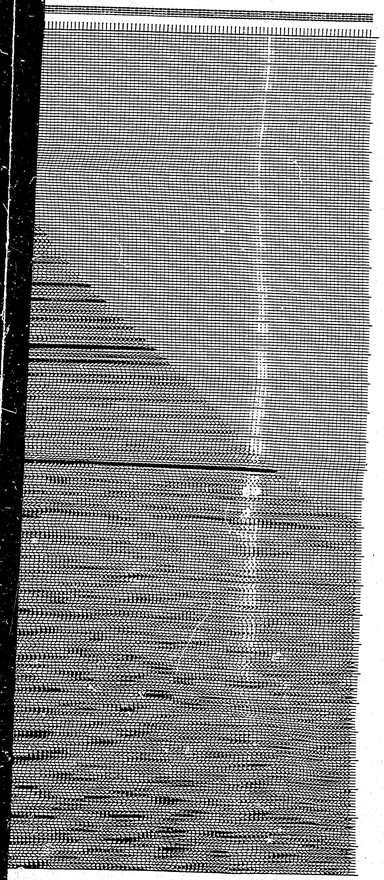
CORRIDOR STACK
10 - 70 HZ
NORMAL



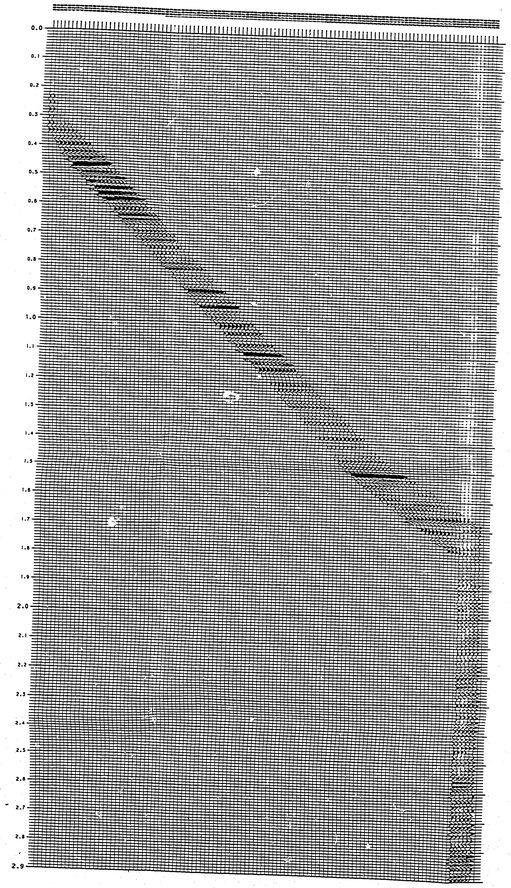
CORRIDOR STACK
10 - 70 HZ
REVERSE



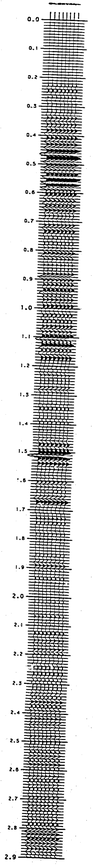
DECONVOLVED
UPWAVES
(IN TWO-WAY TIME)



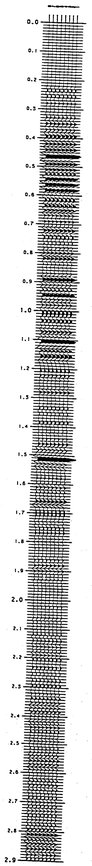
CORRIDOR MUTE
(IN TWO-WAY TIME)



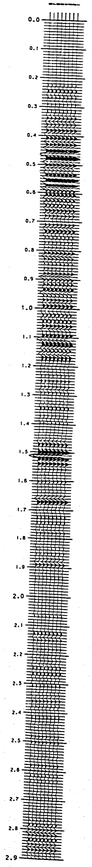
CORRIDOR STACK
10 - 70 HZ
NORMAL



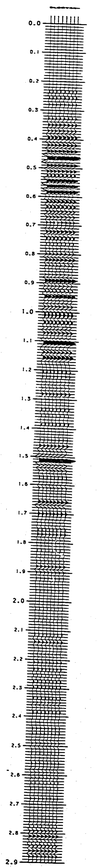
CORRIDOR STACK
10 - 70 HZ
REVERSE



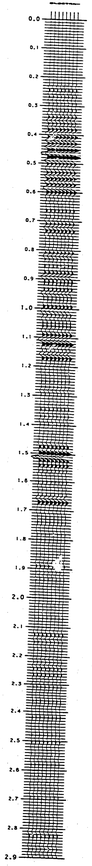
CORRIDOR STACK
10 - 60 HZ
NORMAL



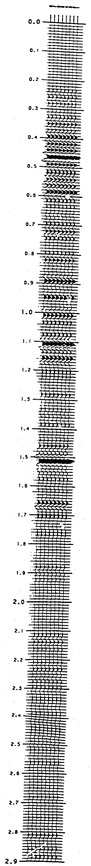
CORRIDOR STACK
10 - 60 HZ
REVERSE



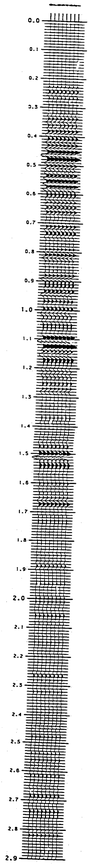
CORRIDOR STACK
10 - 50 HZ
NORMAL



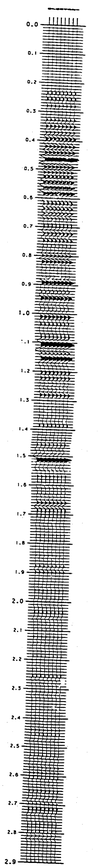
CORRIDOR STACK
10 - 50 HZ
REVERSE



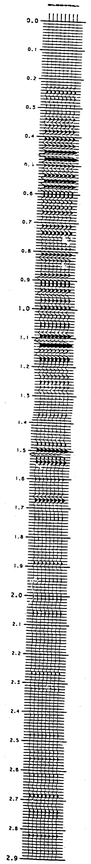
FULL-LENGTH STACK
10 - 70 HZ
NORMAL



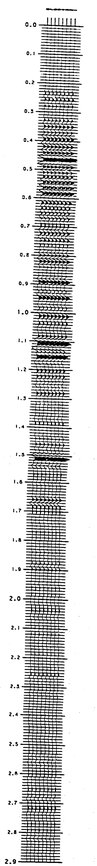
FULL-LENGTH STACK
10 - 70 HZ
REVERSE



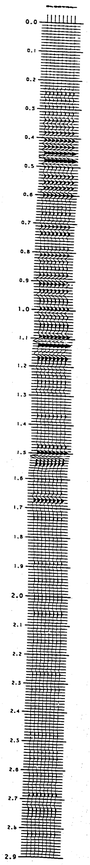
FULL-LENGTH STACK
10 - 60 HZ
NORMAL



FULL-LENGTH STACK
10 - 60 HZ
REVERSE



FULL-LENGTH STACK
10 - 50 HZ
NORMAL



FULL-LENGTH STACK
10 - 50 HZ
REVERSE

