1861

N.E.B. COPY

Geological Report

on

LIARDK29

Well Reached Total Depth on
Mar 27, 1999 @ 07:15

for

CHEVRON CANADA RESOURCES

Prepared For: Rick Schmidtke & Darcy Deibert
Chevron Canada Resources

Prepared By: Brock Lillico
B. Lillico Petroleum Consultants Ltd

Brock Lillico

Well Summary

Storage Units: Metric

Well Information

Operator:	**CHEVRON CANADA RESOURCES**
Well Name:	**LIARDK29**
Location:	
UWI:	300K296030123300
Pool:	NFW
Field:	NFW
Province / State:	NWT
Country:	CANADA
License Number:	

Surface Node Co-ordinates

Hole Type: Deviated **Fault Indicator:** Yes

Latitude: 60.5000000 **Longitude:** 123.5000000

N / S:

E / W:

Bottom Hole Node Co-ordinates

Latitude: **Longitude:**

N / S: 27.63 meters South

E / W: 347.75 meters East

Elevations

			Reference:
Ground Elevation:	409.60	**Kelly Bushing to Ground:**	
Kelly Bushing Elevation:	418.80	**Cut (-):**	
Casing Flange Elevation:		**Fill (+):**	

Total Depth

	Measured Depth	**True Vertical Depth**
Total Depth Driller (Tally) :	3,000.00	2,916.19
Total Depth Driller (Strap or SLM):		
Total Depth Logger:		

Miscellaneous Depths

Plugback Depth:	**Water Depth Reference:**
Whipstock or Sidetrack Depth:	**Water Depth:**

Well Summary

Drilling Contractor:	AKITA DRILLING LTD	**Spud Date:**	Feb 3, 1999 @ 08:00
Rig Release Date:		**Total Depth Date:**	Mar 27, 1999 @ 07:15

Cores	**#**	**Formation**	**Interval**	**Cut**	**Recovered**	**%**

Daily Drilling Summary

Storage Units: Metric

Date	A.M. Depth	Progress	Rotating Hours	Avg. P.R.	Daily Costs	Formation	Operational Status @ Report Time
Feb 18, 1999	711		0.00	0.0		BESA RIVER	Picking up drill pipe
Feb 19, 1999	725		2.50			BESA RIVER	Drilling 311mm hole with GT-1 tooth
							bit.
Feb 20, 1999	972		22.00			BESA RIVER	Drilling 311mm hole
Feb 21, 1999	1,139		12.00			BESA RIVER	Tripping out of hole.
Feb 22, 1999	1,244		2.50			Besa River	Drilling 311mm hole with PDC and
							Mud Motor
Feb 23, 1999	1,349		6.00			Besa River	Pulling out of hole
Feb 24, 1999	1,384		4.50			First Black Shale	Pulling out of hole for MWD
Feb 25, 1999	1,432		8.00			First Black Shale	Running in hole with RR Button Bit
							Reed EHP43H, Mud Motor and
							MWD.
Feb 26, 1999	1,526		10.00			First Black Shale	Directionally Drilling 311mm hole
Feb 27, 1999	1,678		22.00			Lower Besa	Directionally Drilling 311mm hole
						River	
Feb 28, 1999	1,820		18.00			Lower Besa	Pulling out of hole.
						River	
Mar 1, 1999	1,897		14.00			Lower Besa	Directionally Drilling 311mm hole
						River	
Mar 2, 1999	2,026		21.80			Lower Besa	Directionally Drilling 311mm hole
						River	
Mar 3, 1999	2,133		18.00			Lower Besa	Pulling out of hole
						River	
Mar 4, 1999	2,188		9.00			Lower Besa	Directionally Drilling 311mm hole.
						River	
Mar 5, 1999	2,246		11.00			2nd Black Shale	Running in hole with New Bit #11
							Reed HP61.
Mar 6, 1999	2,276		10.50			2nd Black Shale	Weighting up invert mud system
Mar 7, 1999	2,291		8.00			2nd Black Shale	Running in hole with New Bit #12
							HP53
Mar 8, 1999	2,325		19.00			2nd Black Shale	Directionally Drilling 311mm hole.
Mar 9, 1999	2,356		22.00			2nd Black Shale	Pulling out of hole
Mar 10, 1999	2,369		7.50			2nd Black Shale	Directionally Drilling 311mm hole
Mar 11, 1999	2,389		9.00			2nd Black Shale	Preparing to run in hole.
Mar 12, 1999	2,414		17.00			2nd Black Shale	Directionally Drilling 311mm hole

Accumulated Daily Costs:

Date	A.M. Depth	Progress	Rotating Hours	Avg. P.R.	Daily Costs	Formation	Operational Status @ Report Time
Mar 13, 1999	2,449		22.00			2nd Black Shale	Directionally Drilling 311mm hole
Mar 14, 1999	2,500		19.00			Nahanni	Pulling out of hole to log.
Mar 15, 1999	2,500		0.00	0.0		Nahanni	Logging Run #2 UBI-GPIT-EMS
Mar 16, 1999	2,500		0.00	0.0		Nahanni	Pulling out of hole for casing.
Mar 17, 1999	2,500		0.00	0.0		NAHANNI	Running 244mm Intermediate
							Casing, Currently at 2240m.
Mar 18, 1999	2,500		0.00	0.0		NAHANNI	Nipple up BOP's
Mar 19, 1999	2,500		0.00	0.0		Nahanni	Displace hole to water
Mar 20, 1999	2,503		0.30			Nahanni	Running in with Directional Tools.
Mar 21, 1999	2,575		18.00			Nahanni	Pulling out of hole
Mar 22, 1999	2,586		3.00			Nahanni	Directionally Drilling 216mm hole
Mar 23, 1999	2,652		23.00			Nahanni	Directionally Drilling 216mm hole
Mar 24, 1999	2,727		18.00			Nahanni	Pulling out of hole
Mar 25, 1999	2,781		12.00			Nahanni	Directionally Drilling 216mm hole
Mar 26, 1999	2,891		22.00			Nahanni	Directionally Drilling 216mm hole
Mar 27, 1999	3,000		21.50			Nahanni	Circulating bottom hole sample.

Accumulated Daily Costs:

Casing Data Summary

Storage Units: Metric

Casing Type: Surface

Casing Size:	340.0	**Hole Size:**	444.0
Casing Landed @:	701.30	**Total Joints:**	56
Casing Date:	Feb 15, 1999 @ 00:00	**Plug Down Date:**	Feb 15, 1999 @ 16:50

# of Joints / Length / O.D. / Weight: 56 Joints; 693.6m; 340mm; 101kg/m; Landed at 701m.

Cementing Details: Preflush 8m3 water + 3m3 CW100; Lead 84.9m3 1:1:2 + 0.5%D65 + 0.2%D46; Tail 8.4m3 RFC + 1%S1 + 0.2%D46

Remarks: Displaced with 6.5m3 water; 17m3 cement returns.

Casing Type: Intermediate

Casing Size:	244.0	**Hole Size:**	311.0
Casing Landed @:	2,500.00	**Total Joints:**	192
Casing Date:	Mar 17, 1999 @ 00:00	**Plug Down Date:**	Mar 17, 1999 @ 20:33

# of Joints / Length / O.D. / Weight: 192 Joints; 2505.52m; 244mm; 69.94kg/m & 64.74kg/m

Cementing Details: 78 Tonnes Lead, 23 Tonnes Tail

Remarks: Displaced with 96m3 Invert using rig pumps at 2m3/min; 6.5m3 good cement returns; Bumped plug with 17MPa; Set slips in tension with 160000DAN.

Bit Record Table (IADC Grading System)

Storage Units: Metric

*** For more detailed Bit Information refer to Bit Record ***

Bit #	Make	Type	IADC		Depth In	Depth Out	Made	Hours	Avg. P.R.	I.A.D.C. Bit Condition								
			S	T						I	O	MDC	Loc	B	G	ODC	RP1	RP2
1	SEC	S44G			0.0	57.0	57.0	12.70	4.5	5	5	WT	A	E	I	NO	PR	
2	SEC	SS81-J4			57.0	459.0	402.0	52.00	7.7	2	4	BT	H	F	I	WT	TQ	
3	HW	MAX-22G			459.0	529.0	70.0	15.30	4.6	2	2	NO		E	I	NO	BHA	
4	HW	GT1			529.0	711.0	182.0	27.80	6.5	1	1	NO	A	E	I	NO	TD	
5	SMITH	HOLEOP			529.0	711.0	182.0	16.30	11.2	1	1	NO	A	E	I	NO	TD	
4RR	HW	GT-1			711.0	1,183.0	472.0	37.80	12.5	1	1	WT	A	E	I	NO	PR	
6	Hycalog	DS12OH			1,183.0	1,321.0	138.0	9.80	14.1									
7	REED	EHP43H			1,330.0	1,349.0	19.0	3.00	6.3	1	1	WT	A	E	I	NO	DMF	
6RR	HYCAL	DS12OH			1,349.0	1,432.0	83.0	10.75	7.7	0	0	NO			I	NO	BHA	TQ
7RR	REED	EHP43H			1,432.0	1,518.0	86.0	8.00	10.8	8	8	BT	A	F	6	CI	PR	TQ
8	SEC	GS86F			1,518.0	1,820.0	302.0	42.00	7.2	5	6	BT	A	F	8	NO	TQ	
9	HW	GT-20			1,820.0	2,133.0	313.0	53.00	5.9	3	3	CT	M	F	I	CI	TQ	
10	SEC	GS84F			2,133.0	2,246.0	113.0	18.50	6.1	6	8	WT	A	F	2		TQ	
11	REED	HP62A			2,246.0	2,291.0	45.0	14.80	3.0	4	4	WT	A	E	2		PR	
12	REED	HP53A			2,291.0	2,356.0	65.0	40.30	1.6	3	6	BT	A	F	4	WT	TQ	
13	REED	EHP44H			2,356.0	2,389.0	33.0	18.30	1.8	3	2	BT	A	F	1	LT	TQ	
14	SMITH	F-3P			2,389.0	2,500.0	111.0	57.30	1.9	3	4	WT	A	F	1	NO	TD	
15	Security	GS86F			2,500.0	2,575.0	75.0	16.50	4.5	2	2	BT	A	E	I	WT	TQ	
16	Smith	F-3			2,575.0	2,727.0	152.0	41.50	3.7	5	6	BT	H	E	1	WT	TQ	
17	Reed	HP53A			2,727.0	3,000.0	273.0	59.00	4.6									

Total Rotating Hours: 554.65

Bit Record Table (TBG Grading System) Storage Units: Metric

*** For more detailed Bit Information refer to Bit Record ***

Bit #	Make	Type	Size	IADC		Depth In	Depth Out	Made	Hours	Avg. P.R.	Bit Condition		
				S	T						T	B	G
1	SEC	S44G	444.00			0.0	57.0	57.0	12.70	4.5			
2	SEC	SS81-J4	444.00			57.0	459.0	402.0	52.00	7.7			
3	HW	MAX-22GD	444.00			459.0	529.0	70.0	15.30	4.6			
4	HW	GT1	311.00			529.0	711.0	182.0	27.80	6.5			
5	SMITH	HOLEOPEN	444.00			529.0	711.0	182.0	16.30	11.2			
4RR	HW	GT-1	311.00			711.0	1,183.0	472.0	37.80	12.5			
6	Hycalog	DS12OH	311.00			1,183.0	1,321.0	138.0	9.80	14.1			
7	REED	EHP43H	311.00			1,330.0	1,349.0	19.0	3.00	6.3			
6RR	HYCALOG	DS12OH	311.00			1,349.0	1,432.0	83.0	10.75	7.7			
7RR	REED	EHP43H	311.00			1,432.0	1,518.0	86.0	8.00	10.8			
8	SEC	GS86F	311.00			1,518.0	1,820.0	302.0	42.00	7.2			
9	HW	GT-20	311.00			1,820.0	2,133.0	313.0	53.00	5.9			
10	SEC	GS84F	311.00			2,133.0	2,246.0	113.0	18.50	6.1			
11	REED	HP62A	311.00			2,246.0	2,291.0	45.0	14.80	3.0			
12	REED	HP53A	311.00			2,291.0	2,356.0	65.0	40.30	1.6			
13	REED	EHP44H	311.00			2,356.0	2,389.0	33.0	18.30	1.8			
14	SMITH	F-3P	311.00			2,389.0	2,500.0	111.0	57.30	1.9			
15	Security	GS86F	216.00			2,500.0	2,575.0	75.0	16.50	4.5			
16	Smith	F-3	216.00			2,575.0	2,727.0	152.0	41.50	3.7			
17	Reed	HP53A	216.00			2,727.0	3,000.0	273.0	59.00	4.6			

Total Rotating Hours: 554.65

Pump Data

Pump #1	**Model:**	**Size:**	**Type:**
	Pump Rod Diameter:	**Liner Size:**	**Stroke Length:**
	Efficiency Rating (%):		
Pump #2	**Model:**	**Size:**	**Type:**
	Pump Rod Diameter:	**Liner Size:**	**Stroke Length:**
	Efficiency Rating (%):		

Bit Data

Storage Units: Metric

Bit #: 1 **Make:** SEC **Type:** S44G **IADC Series / Type:** /
Serial #: 485679 **Size:** 444.0 **Jets / Nozzles:** 7.50 / 7.50 / 7.50 / **T.F.A.:** 721.00
Depth In: 0.00 **Depth Out:** 57.00 **Made:** 57.00 **Rotating Hours:** 12.70
Average Drill Rate: 4.49 **Total Rotating Hours:** 12.70
Bit Grade / Condition **I.A.D.C.:** 5 / 5 / WT / A / E / I / NO / PR / **T / B / G:** / /
Remarks:
Formations Drilled: Surface with Boulders
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	15,000	/	16,000	**R.P.M.:**	140	/	140
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	2,100	/	2,100	**Mud Density:**	1,054	/	1,055
Drift Angle:		/		**Funnel Viscosity:**	43	/	44

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit #: 2 **Make:** SEC **Type:** SS81-J4 **IADC Series / Type:** /
Serial #: 87700 **Size:** 444.0 **Jets / Nozzles:** 3.50 / 3.50 / 3.50 / 9.50 **T.F.A.:** 728.00
Depth In: 57.00 **Depth Out:** 459.00 **Made:** 402.00 **Rotating Hours:** 52.00
Average Drill Rate: 7.73 **Total Rotating Hours:** 64.70
Bit Grade / Condition **I.A.D.C.:** 2 / 4 / BT / H / F / I / WT / TQ / **T / B / G:** / /
Remarks:
Formations Drilled: Surface, Besa River
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	16,000	/	26,000	**R.P.M.:**	50	/	180
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	5,300	/	9,800	**Mud Density:**	1,065	/	1,155
Drift Angle:	0.250	/	2.000	**Funnel Viscosity:**	55	/	77

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit Data

Storage Units: Metric

Bit #: 3 **Make:** HW **Type:** AX-22GD **IADC Series / Type:** /
Serial #: T22CT **Size:** 444.0 **Jets / Nozzles:** 7.50 / 7.50 / 7.50 / **T.F.A.:**
Depth In: 459.00 **Depth Out:** 529.00 **Made:** 70.00 **Rotating Hours:** 15.30
Average Drill Rate: 4.58 **Total Rotating Hours:** 80.00
Bit Grade / Condition **I.A.D.C.:** 2 / 2 / NO / / E / I / NO / BHA / **T / B / G:** / /
Remarks:
Formations Drilled: Besa River
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	10,000	/	20,000	**R.P.M.:**	120	/	180
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	12,500	/	13,100	**Mud Density:**	1,155	/	1,155
Drift Angle:	2.000	/	4.500	**Funnel Viscosity:**	54	/	55

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit #: 4 **Make:** HW **Type:** GT1 **IADC Series / Type:** /
Serial #: Y79YK **Size:** 311.0 **Jets / Nozzles:** 0.00 / 0.00 / 0.00 / **T.F.A.:** 942.00
Depth In: 529.00 **Depth Out:** 711.00 **Made:** 182.00 **Rotating Hours:** 27.80
Average Drill Rate: 6.55 **Total Rotating Hours:** 107.80
Bit Grade / Condition **I.A.D.C.:** 1 / 1 / NO / A / E / I / NO / TD / **T / B / G:** / /
Remarks:
Formations Drilled: Besa River
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	1,000	/	5,000	**R.P.M.:**	150	/	180
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	13,400	/	14,600	**Mud Density:**	1,146	/	1,155
Drift Angle:	3.000	/	4.500	**Funnel Viscosity:**	58	/	73

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit #: 5 **Make:** SMITH **Type:** LEOPEN **IADC Series / Type:** /
Serial #: HO44780 **Size:** 444.0 **Jets / Nozzles:** 5.90 / 5.90 / 5.90 / **T.F.A.:** 596.00
Depth In: 529.00 **Depth Out:** 711.00 **Made:** 182.00 **Rotating Hours:** 16.30
Average Drill Rate: 11.17 **Total Rotating Hours:** 124.10
Bit Grade / Condition **I.A.D.C.:** 1 / 1 / NO / A / E / I / NO / TD / **T / B / G:** / /
Remarks:
Formations Drilled: Besa River
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	1,000	/	5,000	**R.P.M.:**	80	/	90
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	12,100	/	13,400	**Mud Density:**	1,140	/	1,146
Drift Angle:	3.000	/	4.500	**Funnel Viscosity:**	58	/	103

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit Data

Storage Units: Metric

Bit #: 4RR **Make:** HW **Type:** GT-1 **IADC Series / Type:** /
Serial #: Y79YIC **Size:** 311.0 **Jets / Nozzles:** 2.70 / 2.70 / 5.90 / **T.F.A.:**
Depth In: 711.00 **Depth Out:** 1,183.00 **Made:** 472.00 **Rotating Hours:** 37.80
Average Drill Rate: 12.49 **Total Rotating Hours:** 161.90
Bit Grade / Condition **I.A.D.C.:** 1 / 1 / WT / A / E / I / NO / PR / **T / B / G:** / /
Remarks:
Formations Drilled: Besa River
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	4,000	/	8,000	**R.P.M.:**	60	/	150
Pump 1 S.P.M. / Volume:	85	/	1,087.00	**Pump 2 S.P.M. / Volume:**	85.00	/	1,175.00
S.P.P.:	12,100	/	16,600	**Mud Density:**	910	/	920
Drift Angle:	3.000	/	4.000	**Funnel Viscosity:**	56	/	60

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit #: 6 **Make:** Hycalog **Type:** DS12OH **IADC Series / Type:** /
Serial #: 444392 **Size:** 311.0 **Jets / Nozzles:** 5.90 / 5.90 / 5.90 / 5.90 **T.F.A.:**
Depth In: 1,183.00 **Depth Out:** 1,321.00 **Made:** 138.00 **Rotating Hours:** 9.80
Average Drill Rate: 14.08 **Total Rotating Hours:** 171.70
Bit Grade / Condition **I.A.D.C.:** / / / / / / / / **T / B / G:** / /
Remarks:
Formations Drilled: Besa River
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	2,000	/	3,000	**R.P.M.:**	200	/	220
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	18,000	/	19,150	**Mud Density:**	930	/	930
Drift Angle:	5.000	/	7.750	**Funnel Viscosity:**	60	/	70

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit #: 7 **Make:** REED **Type:** EHP43H **IADC Series / Type:** /
Serial #: XL5158 **Size:** 311.0 **Jets / Nozzles:** 2.20 / 2.20 / 2.20 / **T.F.A.:**
Depth In: 1,330.00 **Depth Out:** 1,349.00 **Made:** 19.00 **Rotating Hours:** 3.00
Average Drill Rate: 6.33 **Total Rotating Hours:** 174.70
Bit Grade / Condition **I.A.D.C.:** 1 / 1 / WT / A / E / I / NO / DMF / **T / B / G:** / /
Remarks:
Formations Drilled: Besa River
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	10,000	/	10,000	**R.P.M.:**	200	/	200
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	17,000	/	17,000	**Mud Density:**	930	/	930
Drift Angle:		/		**Funnel Viscosity:**		/	

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit Data

Storage Units: Metric

Bit #: 6RR **Make:** YCALOG **Type:** DS12OH **IADC Series / Type:** /
Serial #: 444392 **Size:** 311.0 **Jets / Nozzles:** 5.90 / 5.90 / 5.90 / 5.90 **T.F.A.:**
Depth In: 1,349.00 **Depth Out:** 1,432.00 **Made:** 83.00 **Rotating Hours:** 10.75
Average Drill Rate: 7.72 **Total Rotating Hours:** 185.45
Bit Grade / Condition **I.A.D.C.:** 0 / 0 / NO / / / I / NO / BHA / TQ **T / B / G:** / /
Remarks:
Formations Drilled: Besa River
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	3,000	/	4,000	**R.P.M.:**	200	/	200
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	13,000	/	16,000	**Mud Density:**	970	/	980
Drift Angle:	7.900	/	11.900	**Funnel Viscosity:**	60	/	61

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit #: 7RR **Make:** REED **Type:** EHP43H **IADC Series / Type:** /
Serial #: XL5158 **Size:** 311.0 **Jets / Nozzles:** 2.20 / 2.20 / 9.10 / **T.F.A.:**
Depth In: 1,432.00 **Depth Out:** 1,518.00 **Made:** 86.00 **Rotating Hours:** 8.00
Average Drill Rate: 10.75 **Total Rotating Hours:** 193.45
Bit Grade / Condition **I.A.D.C.:** 8 / 8 / BT / A / F / 6 / CI / PR / TQ **T / B / G:** / /
Remarks:
Formations Drilled: Besa River, First Black Shale
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	9,000	/	10,000	**R.P.M.:**	140	/	150
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	13,000	/	13,000	**Mud Density:**	980	/	980
Drift Angle:	9.000	/	12.000	**Funnel Viscosity:**	60	/	60

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit #: 8 **Make:** SEC **Type:** GS86F **IADC Series / Type:** /
Serial #: 725280 **Size:** 311.0 **Jets / Nozzles:** 9.10 / 9.10 / 9.10 / **T.F.A.:**
Depth In: 1,518.00 **Depth Out:** 1,820.00 **Made:** 302.00 **Rotating Hours:** 42.00
Average Drill Rate: 7.19 **Total Rotating Hours:** 235.45
Bit Grade / Condition **I.A.D.C.:** 5 / 6 / BT / A / F / 8 / NO / TQ / **T / B / G:** / /
Remarks:
Formations Drilled: First Black Shale, Lower Besa River
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	10,000	/	12,000	**R.P.M.:**	120	/	130
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	11,000	/	12,000	**Mud Density:**	970	/	985
Drift Angle:	3.400	/	7.300	**Funnel Viscosity:**	61	/	69

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit Data

Storage Units: Metric

Bit #: 9 **Make:** HW **Type:** GT-20 **IADC Series / Type:** /
Serial #: W10YM **Size:** 311.0 **Jets / Nozzles:** 9.00 / 9.00 / 7.50 / **T.F.A.:**
Depth In: 1,820.00 **Depth Out:** 2,133.00 **Made:** 313.00 **Rotating Hours:** 53.00
Average Drill Rate: 5.91 **Total Rotating Hours:** 288.45
Bit Grade / Condition **I.A.D.C.:** 3 / 3 / CT / M / F / I / CI / TQ / **T / B / G:** / /
Remarks:
Formations Drilled: Lower Besa River
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	12,000	/	15,000	**R.P.M.:**	100	/	130
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	11,200	/	12,100	**Mud Density:**	1,010	/	1,015
Drift Angle:	3.400	/	4.800	**Funnel Viscosity:**		/	

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit #: 10 **Make:** SEC **Type:** GS84F **IADC Series / Type:** /
Serial #: 740870 **Size:** 311.0 **Jets / Nozzles:** 9.00 / 9.00 / 7.50 / **T.F.A.:**
Depth In: 2,133.00 **Depth Out:** 2,246.00 **Made:** 113.00 **Rotating Hours:** 18.50
Average Drill Rate: 6.11 **Total Rotating Hours:** 306.95
Bit Grade / Condition **I.A.D.C.:** 6 / 8 / WT / A / F / 2 / / TQ / **T / B / G:** / /
Remarks:
Formations Drilled: Lower Besa River, scubbed out in 2nd Black Shale
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	12,000	/	14,000	**R.P.M.:**	100	/	130
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	14,000	/	14,500	**Mud Density:**	1,015	/	1,020
Drift Angle:	4.500	/	6.600	**Funnel Viscosity:**	75	/	80

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit #: 11 **Make:** REED **Type:** HP62A **IADC Series / Type:** /
Serial #: MM9034 **Size:** 311.0 **Jets / Nozzles:** 9.00 / 9.00 / 7.50 / **T.F.A.:**
Depth In: 2,246.00 **Depth Out:** 2,291.00 **Made:** 45.00 **Rotating Hours:** 14.80
Average Drill Rate: 3.04 **Total Rotating Hours:** 321.75
Bit Grade / Condition **I.A.D.C.:** 4 / 4 / WT / A / E / 2 / / PR / **T / B / G:** / /
Remarks:
Formations Drilled: 2nd Black Shale
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	12,000	/	14,000	**R.P.M.:**	100	/	130
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	13,000	/	14,000	**Mud Density:**	1,025	/	1,230
Drift Angle:	3.000	/	4.000	**Funnel Viscosity:**	71	/	80

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit Data

Storage Units: Metric

Bit #: 12 **Make:** REED **Type:** HP53A **IADC Series / Type:** /
Serial #: LK4965 **Size:** 311.0 **Jets / Nozzles:** 2.00 / 2.00 / 7.50 / **T.F.A.:**
Depth In: 2,291.00 **Depth Out:** 2,356.00 **Made:** 65.00 **Rotating Hours:** 40.30
Average Drill Rate: 1.61 **Total Rotating Hours:** 362.05
Bit Grade / Condition **I.A.D.C.:** 3 / 6 / BT / A / F / 4 / WT / TQ / **T / B / G:** / /
Remarks:
Formations Drilled: 2nd Black Shale
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	14,000	/	15,000	**R.P.M.:**	100	/	130
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	16,000	/	16,900	**Mud Density:**	1,230	/	1,235
Drift Angle:	3.200	/	4.400	**Funnel Viscosity:**	66	/	72

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit #: 13 **Make:** REED **Type:** EHP44H **IADC Series / Type:** /
Serial #: NN3675 **Size:** 311.0 **Jets / Nozzles:** 2.20 / 2.20 / 7.50 / **T.F.A.:**
Depth In: 2,356.00 **Depth Out:** 2,389.00 **Made:** 33.00 **Rotating Hours:** 18.30
Average Drill Rate: 1.80 **Total Rotating Hours:** 380.35
Bit Grade / Condition **I.A.D.C.:** 3 / 2 / BT / A / F / 1 / LT / TQ / **T / B / G:** / /
Remarks:
Formations Drilled: 2nd Black Shale
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	14,000	/	15,000	**R.P.M.:**	100	/	130
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	16,000	/	16,900	**Mud Density:**	1,235	/	1,240
Drift Angle:	4.900	/	5.700	**Funnel Viscosity:**	65	/	70

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit #: 14 **Make:** SMITH **Type:** F-3P **IADC Series / Type:** /
Serial #: LN5346 **Size:** 311.0 **Jets / Nozzles:** 2.20 / 2.20 / 2.20 / **T.F.A.:**
Depth In: 2,389.00 **Depth Out:** 2,500.00 **Made:** 111.00 **Rotating Hours:** 57.30
Average Drill Rate: 1.94 **Total Rotating Hours:** 437.65
Bit Grade / Condition **I.A.D.C.:** 3 / 4 / WT / A / F / 1 / NO / TD / **T / B / G:** / /
Remarks:
Formations Drilled: 2nd Black Shale
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	14,000	/	15,000	**R.P.M.:**	120	/	130
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	14,600	/	16,900	**Mud Density:**	1,240	/	1,270
Drift Angle:	4.400	/	5.500	**Funnel Viscosity:**	56	/	67

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit Data

Storage Units: Metric

Bit #: 15 **Make:** Security **Type:** GS86F **IADC Series / Type:** /
Serial #: 731699 **Size:** 216.0 **Jets / Nozzles:** 5.90 / 5.90 / 5.90 / **T.F.A.:**
Depth In: 2,500.00 **Depth Out:** 2,575.00 **Made:** 75.00 **Rotating Hours:** 16.50
Average Drill Rate: 4.55 **Total Rotating Hours:** 454.15
Bit Grade / Condition **I.A.D.C.:** 2 / 2 / BT / A / E / I / WT / TQ / **T / B / G:** / /
Remarks:
Formations Drilled: NAHANNI
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	12,000	/	16,000	**R.P.M.:**	60	/	85
Pump 1 S.P.M. / Volume:	120	/	1,500.00	**Pump 2 S.P.M. / Volume:**	120.00	/	1,500.00
S.P.P.:	9,700	/	10,200	**Mud Density:**	1,070	/	1,125
Drift Angle:	4.600	/	13.500	**Funnel Viscosity:**	58	/	75

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** 2,665.00 **Theoretical:** 46 **Actual:** 52

Bit #: 16 **Make:** Smith **Type:** F-3 **IADC Series / Type:** /
Serial #: LR0031 **Size:** 216.0 **Jets / Nozzles:** 5.90 / 5.90 / 5.90 / **T.F.A.:**
Depth In: 2,575.00 **Depth Out:** 2,727.00 **Made:** 152.00 **Rotating Hours:** 41.50
Average Drill Rate: 3.66 **Total Rotating Hours:** 495.65
Bit Grade / Condition **I.A.D.C.:** 5 / 6 / BT / H / E / 1 / WT / TQ / **T / B / G:** / /
Remarks:
Formations Drilled: Nahanni
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	14,000	/	16,000	**R.P.M.:**	60	/	80
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	9,200	/	9,500	**Mud Density:**	1,105	/	1,125
Drift Angle:	18.200	/	36.800	**Funnel Viscosity:**	45	/	55

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Bit #: 17 **Make:** Reed **Type:** HP53A **IADC Series / Type:** /
Serial #: LQ **Size:** 216.0 **Jets / Nozzles:** 5.90 / 5.90 / 5.90 / **T.F.A.:**
Depth In: 2,727.00 **Depth Out:** 3,000.00 **Made:** 273.00 **Rotating Hours:** 59.00
Average Drill Rate: 4.63 **Total Rotating Hours:** 554.65
Bit Grade / Condition **I.A.D.C.:** / / / / / / / / **T / B / G:** / /
Remarks:
Formations Drilled: Nahanni
Drilling Parameters

	Min		Max		Min		Max
Force on Bit:	12,000	/	16,000	**R.P.M.:**	60	/	80
Pump 1 S.P.M. / Volume:		/		**Pump 2 S.P.M. / Volume:**		/	
S.P.P.:	9,200	/	9,600	**Mud Density:**	1,110	/	1,140
Drift Angle:	36.000	/	36.800	**Funnel Viscosity:**	45	/	60

Annular Velocity **Drill Collars:** **HeavyWeight Drill Pipe:** **Drill Pipe:**
Bottoms Up **Depth:** **Theoretical:** **Actual:**

Wireline Logging Summary

Storage Units: Metric

Logging Suite Number: 1
Wireline Logging Company: Schlumberger
District: Grande Prairie
Witness: B. Lillico

Engineer: Tanya Schneider
Unit Number: 2025

Was Pressure Control Equipment Utilized:
Was the Logging Job Mechanically Assisted:

Maximum Deviation: 12.000 °
Hole Size: 311.0

Total Lost Time:
Loggers' Total Down Time: 14.00
Total Job Time (From Rig up to Rig down): 31.50

	Measured Depth	True Vertical Depth
Casing Depth Driller	701.30	700.70
Casing Depth Logger	703.50	
Total Depth Driller (Tally)	2,500.00	2,491.40
Total Depth Driller (Strap or SLM)	2,502.00	

General Remarks: Loggers had difficulty with UBI, motor on bottom would not spin, tripped out and changed out the telemetry tool.
Ran UBI-GPIT-GAMMA RAY 2485-1975m, 800-702m.

Logging Run #: 1
Date: Mar 14, 1999

Drilling Fluid Data

Drilling Fluid Type: Oil Based Invert
Fluid Density: 1270 **Viscosity:** 57 **pH:** 9.0 **Fluid Loss:**

Mud Resistivity (Rm): @ °
Mud Resistivity (Rm) @ BHT: @ °
Mud Filtrate Resistivity (Rmf): @ °
Mud Cake Resistivity (Rmc): @ °

Maximum Temperature: 120.0 °
Source (Rmf):
Source (Rmc):

Logging Run Information

Date on Bottom: Mar 14, 1999
Total Depth Logger: 2,508.00 (MD) (TVD)

Logging Tools: AIT-DSI-EMS-AMS-GPIT; 2508-702m; Gamma Ray to Surface.

Remarks: Loggers Depth 8 meters deeper than Drillers Depth.

Hole Conditions: Excellent

Logging Run #: 2
Date: Mar 15, 1999

Drilling Fluid Data

Drilling Fluid Type: Oil Based Invert
Fluid Density: 1270 **Viscosity:** 57 **pH:** 9.0 **Fluid Loss:**

Mud Resistivity (Rm): @ °
Mud Resistivity (Rm) @ BHT: @ ° **Maximum Temperature:** 133.0 °
Mud Filtrate Resistivity (Rmf): @ ° **Source (Rmf):**
Mud Cake Resistivity (Rmc): @ ° **Source (Rmc):**

Logging Run Information

Date on Bottom: Mar 15, 1999
Total Depth Logger: 2,508.00 (MD) (TVD)

Logging Tools: UBI-GPIT-GAMMA RAY; Ran to bottom; tool failed; no log; Pulled out of hole and changed telemetry tool.

Remarks: Tool did not work; motor on bottom of UBI tool would not spin; Pulled out of hole, shale plugged onto spinning unit on bottom of tool.

Hole Conditions: Excellent

Logging Run #: 3
Date: Mar 15, 1999

Drilling Fluid Data

Drilling Fluid Type: Oil Based Invert
Fluid Density: 1270 **Viscosity:** 57 **pH:** 9.0 **Fluid Loss:**

Mud Resistivity (Rm): @ °
Mud Resistivity (Rm) @ BHT: @ ° **Maximum Temperature:** 117.0 °
Mud Filtrate Resistivity (Rmf): @ ° **Source (Rmf):**
Mud Cake Resistivity (Rmc): @ ° **Source (Rmc):**

Logging Run Information

Date on Bottom: Mar 15, 1999
Total Depth Logger: 2,485.00 (MD) (TVD)

Logging Tools: UBI-GPIT-GAMMA RAY; 2485-1975m, 800-702m.

Remarks: Did not run all the way to bottom, stopped at 2485m and logged out.

Hole Conditions: Excellent

Wireline Logging Summary

Storage Units: Metric

Logging Suite Number: 2
Wireline Logging Company: Schlumberger
District: Grande Prairie
Witness: B. Lillico

Engineer: Tanya Schneider
Unit Number: 2016

Was Pressure Control Equipment Utilized:
Was the Logging Job Mechanically Assisted:

Maximum Deviation: 37.000 °
Hole Size: 216.0

Total Lost Time:
Loggers' Total Down Time:
Total Job Time (From Rig up to Rig down):

	Measured Depth	True Vertical Depth
Casing Depth Driller		
Casing Depth Logger		
Total Depth Driller (Tally)	3,000.00	
Total Depth Driller (Strap or SLM)		

General Remarks: Geologist off location at TD; Planned logging program: #1 AIT-DSI, #2 CNL-LDT-ARI-CCL, #3 NGR-FMI

Logging Run #:
Date:

Drilling Fluid Data

Drilling Fluid Type:
Fluid Density: **Viscosity:** **pH:** **Fluid Loss:**

Mud Resistivity (Rm): @ °
Mud Resistivity (Rm) @ BHT: @ ° **Maximum Temperature:** °
Mud Filtrate Resistivity (Rmf): @ ° **Source (Rmf):**
Mud Cake Resistivity (Rmc): @ ° **Source (Rmc):**

Logging Run Information

Date on Bottom:
Total Depth Logger: (MD) (TVD)

Logging Tools:

Remarks:

Hole Conditions:

Deviation / Directional Survey Report

Directional Drilling Company:	
Directional Drillers:	
Measured While Drilling (MWD) Hands:	
Survey Type:	magnetic
Survey Mode:	single shot
Survey Date:	2/16/99
Survey Calculation Method:	minimum curvature
Vertical Section Calculated on:	56.66 ° plane

Survey Tie-In Information

Tie-In Depths **Measured Depth:** **True Vertical Depth (TVD):**

Tie-In Node **Latitude:** **Longitude:**

Tie-In Co-Ordinantes

N / S:

E / W:

Kick-Off (Whipstock) Information

Kick-Off Depths **Measured Depth:** **True Vertical Depth (TVD):**

Kick-Off Node **Latitude:** **Longitude:**

Kick-Off Co-Ordinantes

N / S:

E / W:

Remarks:

Measured Depth	T.V.D.	Drift Angle (°)	Azimuth (°)	+N / -S Distance	+E / -W Distance	Vertical Section	DogLeg Severity
221.00	221.00	0.250	1.70	0.48	0.02	0.28	0.03
306.00	306.00	1.250	311.70	1.28	-0.67	0.14	0.40
425.00	424.90	2.000	296.70	3.08	-3.50	-1.23	0.22
513.00	512.90	3.750	71.70	4.68	-2.14	0.79	1.85
538.00	537.80	4.350	51.70	5.52	-0.62	2.52	1.86
573.00	572.70	4.100	47.69	7.18	1.35	5.08	0.34
611.00	610.60	4.500	42.69	9.20	3.37	7.87	0.44
642.00	641.50	4.000	41.79	10.89	4.91	10.09	0.50
676.00	675.50	3.500	30.80	12.67	6.23	12.17	0.78
702.00	701.40	3.000	30.69	13.94	6.99	13.50	0.59
742.00	741.36	3.250	32.00	15.80	8.12	15.47	0.20
791.00	790.28	3.250	37.00	18.09	9.69	18.04	0.17
913.00	912.04	4.000	49.00	23.64	14.99	25.51	0.26
961.00	959.93	3.870	41.00	25.96	17.31	28.73	0.35
1,027.00	1,025.77	4.000	38.00	29.46	20.19	33.06	0.11
1,103.00	1,101.59	4.000	32.00	33.79	23.23	37.98	0.16
1,159.00	1,157.42	4.870	35.00	37.40	25.63	41.96	48.00
1,219.00	1,217.20	5.000	56.00	40.94	29.26	46.94	0.90
1,248.00	1,246.08	5.500	59.00	42.36	31.50	49.60	0.59
1,286.00	1,283.85	7.000	57.00	44.56	35.00	53.73	1.20
1,324.00	1,321.54	7.750	55.00	47.29	39.04	58.61	0.63

Deviation / Directional Survey Report

Directional Drilling Company:	Baker Hughes Inteq
Directional Drillers:	Barry Maser
Measured While Drilling (MWD) Hands:	Anthony Khan
Survey Type:	electronic
Survey Mode:	MWD
Survey Date:	2/25/99
Survey Calculation Method:	minimum curvature
Vertical Section Calculated on:	56.66 ° plane

Survey Tie-In Information

Tie-In Depths **Measured Depth:** **True Vertical Depth (TVD):**

Tie-In Node **Latitude:** **Longitude:**

Tie-In Co-Ordinantes

N / S:

E / W:

Kick-Off (Whipstock) Information

Kick-Off Depths **Measured Depth:** **True Vertical Depth (TVD):**

Kick-Off Node **Latitude:** **Longitude:**

Kick-Off Co-Ordinantes

N / S:

E / W:

Remarks:

Measured Depth	T.V.D.	Drift Angle (°)	Azimuth (°)	+N / -S Distance	+E / -W Distance	Vertical Section	DogLeg Severity
1,359.50	1,356.71	7.900	59.60	49.93	43.12	63.46	0.54
1,369.00	1,366.11	8.500	60.50	50.61	44.29	64.82	1.94
1,388.10	1,384.97	9.800	62.50	52.06	46.96	67.84	2.10
1,397.70	1,394.42	10.500	61.80	52.85	48.46	69.53	2.22
1,407.30	1,403.84	11.300	62.20	53.70	50.06	71.33	2.51
1,416.90	1,413.25	11.900	62.60	54.59	51.77	73.25	1.89
1,436.00	1,431.94	12.000	62.90	56.37	55.27	77.16	0.18
1,455.00	1,450.56	10.900	56.70	58.26	58.53	80.92	2.60
1,484.00	1,479.11	9.200	50.90	61.23	62.63	85.97	2.04
1,502.00	1,496.88	9.000	52.60	63.02	64.88	88.84	0.56
1,512.70	1,507.45	8.900	55.00	64.00	66.23	90.50	1.08
1,541.40	1,535.86	7.300	59.70	66.20	69.62	94.54	1.81
1,570.20	1,564.46	6.300	56.70	67.99	72.52	97.95	1.11
1,598.90	1,593.01	5.600	52.20	69.71	74.94	100.92	0.88
1,627.60	1,621.58	5.200	60.20	71.21	77.18	103.62	0.89
1,656.40	1,650.29	3.900	68.20	72.23	79.22	105.88	1.50
1,665.90	1,659.77	3.600	67.20	72.46	79.79	106.49	0.97
1,675.50	1,669.35	3.700	64.60	72.71	80.35	107.09	0.60
1,685.10	1,678.93	3.700	66.10	72.97	80.92	107.70	0.30
1,713.80	1,707.57	3.400	80.70	73.48	82.60	109.39	0.99
1,733.00	1,726.73	4.200	74.30	73.76	83.84	110.58	1.41
1,752.20	1,745.87	5.100	63.40	74.34	85.28	112.10	1.96
1,780.90	1,774.47	4.600	50.90	75.63	87.31	114.51	1.22
1,790.40	1,783.94	4.700	49.40	76.13	87.91	115.28	0.50
1,819.10	1,812.54	4.800	59.60	77.50	89.83	117.64	0.89
1,838.30	1,831.68	4.500	67.60	78.19	91.22	119.19	1.12
1,857.50	1,850.82	4.500	69.90	78.74	92.63	120.66	0.28
1,886.20	1,879.43	4.400	72.30	79.46	94.73	122.81	0.22
1,915.00	1,908.15	4.200	73.30	80.10	96.80	124.89	0.22
1,943.80	1,936.88	3.700	70.90	80.71	98.68	126.80	0.55
1,953.30	1,946.36	3.800	70.40	80.91	99.27	127.40	0.33
1,972.50	1,965.52	3.800	62.80	81.42	100.44	128.65	0.79
2,001.20	1,994.16	3.700	56.10	82.37	102.05	130.53	0.47
2,030.00	2,022.90	3.400	63.60	83.27	103.59	132.32	0.58
2,049.10	2,041.97	3.400	59.50	83.81	104.58	133.44	0.38
2,058.70	2,051.55	3.500	61.70	84.09	105.08	134.02	0.52

2,077.80	2,070.61	3.700	75.60	84.52	106.19	135.18	1.40
2,087.40	2,080.19	3.900	79.30	84.66	106.82	135.78	0.99
2,116.20	2,108.93	3.800	90.30	84.83	108.73	137.47	0.78
2,144.50	2,137.15	4.500	85.70	84.91	110.78	139.21	0.82
2,173.30	2,165.85	5.300	72.40	85.40	113.17	50.72	1.44
2,202.00	2,194.39	6.600	60.60	86.61	115.87	52.37	1.86
2,221.20	2,213.48	5.800	60.70	87.63	117.68	53.36	1.25
2,230.70	2,222.93	5.600	60.70	88.09	118.50	53.82	0.63
2,259.50	2,251.63	4.000	52.10	89.39	120.52	54.84	1.82
2,269.00	2,261.12	3.000	40.20	89.79	120.79	54.99	3.89
2,288.20	2,280.29	2.800	25.30	90.59	121.47	55.00	1.21
2,307.30	2,299.36	3.200	22.90	91.51	121.87	54.86	0.66
2,316.90	2,308.95	3.400	27.80	92.01	122.11	54.80	1.08
2,326.40	2,318.40	3.900	32.00	92.53	122.41	54.98	1.79
2,335.90	2,327.90	4.400	34.80	93.10	122.79	54.80	1.70
2,355.10	2,347.04	4.900	49.20	94.24	123.83	55.08	1.98
2,374.30	2,366.16	5.400	59.50	95.24	125.23	55.74	1.64
2,384.00	2,375.82	5.700	62.20	95.69	126.05	56.19	1.23
2,393.70	2,385.47	5.500	64.20	96.12	126.90	56.68	0.86
2,403.30	2,395.03	5.500	68.80	96.49	127.74	57.20	1.38
2,413.10	2,404.79	5.300	69.40	96.82	128.60	57.76	0.64
2,422.70	2,414.35	5.200	69.50	97.12	129.42	58.29	0.31
2,432.40	2,424.00	5.300	68.10	97.44	130.25	58.82	0.50
2,442.00	2,433.56	5.200	66.50	97.78	131.06	163.24	0.55
2,461.40	2,452.89	4.700	60.00	98.53	132.56	164.89	1.16
2,471.00	2,462.46	4.500	62.30	98.90	133.23	165.66	0.85
2,484.00	2,475.42	4.400	62.60	99.37	134.13	166.67	0.24

Deviation / Directional Survey Report

Directional Drilling Company:	Baker Hughes Inteq
Directional Drillers:	Barry Maser
Measured While Drilling (MWD) Hands:	Anthony Khan
Survey Type:	electronic
Survey Mode:	MWD
Survey Date:	3/20/99
Survey Calculation Method:	minimum curvature
Vertical Section Calculated on:	122.00 ° plane

Survey Tie-In Information

Tie-In Depths **Measured Depth:** **True Vertical Depth (TVD):**

Tie-In Node **Latitude:** **Longitude:**

Tie-In Co-Ordinantes

N / S:

E / W:

Kick-Off (Whipstock) Information

Kick-Off Depths **Measured Depth:** **True Vertical Depth (TVD):**

Kick-Off Node **Latitude:** **Longitude:**

Kick-Off Co-Ordinantes

N / S:

E / W:

Remarks: Last Survey at 3000m is an extrapolation. Directional work went very well, maximum angle 37.4 degrees, maximum dogleg 8.5 degrees per 30.

Measured Depth	T.V.D.	Drift Angle (°)	Azimuth (°)	+N / -S Distance	+E / -W Distance	Vertical Section	DogLeg Severity
2,510.00	2,501.34	4.600	71.00	100.17	136.00	62.26	0.79
2,519.60	2,510.90	5.700	91.90	100.28	136.84	62.91	6.74
2,529.30	2,520.54	7.200	103.30	100.12	137.91	63.90	6.08
2,539.00	2,530.14	9.400	107.90	99.74	139.26	65.24	7.10
2,548.60	2,539.59	11.000	112.50	99.15	140.85	66.91	5.61
2,558.30	2,549.07	13.500	115.90	98.30	142.72	68.94	8.04
2,569.70	2,560.12	15.000	120.40	96.97	145.19	71.74	4.90
2,579.30	2,569.36	16.100	122.50	95.63	147.39	74.32	3.86
2,588.80	2,578.44	18.200	126.60	94.03	149.69	77.11	7.65
2,598.40	2,587.51	20.300	129.00	92.09	152.19	80.26	7.01
2,608.00	2,596.44	22.600	128.80	89.89	154.92	83.75	7.19
2,617.50	2,605.12	15.300	129.00	87.47	157.92	87.57	8.53
2,626.90	2,613.53	27.800	128.60	84.83	161.19	91.74	8.00
2,636.40	2,621.85	29.800	126.40	82.05	164.83	96.30	7.15
2,646.00	2,630.10	31.900	123.90	79.22	168.85	101.21	7.69
2,655.60	2,638.16	33.900	123.20	76.34	173.20	106.43	6.36
2,665.20	2,646.02	36.000	122.40	73.36	177.82	111.92	6.72
2,674.80	2,653.75	36.800	121.10	70.36	182.66	117.62	3.47
2,684.50	2,661.50	37.100	120.60	67.37	187.67	123.45	1.31
2,694.20	2,669.22	37.400	121.80	64.33	192.69	129.32	2.43
2,703.90	2,676.97	36.700	122.50	61.22	197.64	135.17	2.53
2,713.50	2,684.70	35.900	121.40	58.21	202.46	140.85	3.22
2,723.20	2,692.57	35.600	120.60	55.30	207.32	146.52	1.72
2,732.90	2,700.46	35.700	121.30	52.39	212.17	152.17	1.30
2,742.60	2,708.31	36.200	122.70	49.37	217.00	157.86	2.98
2,752.20	2,716.04	36.600	123.40	46.26	221.77	163.56	1.80
2,761.90	2,723.84	36.200	121.80	43.16	226.62	169.31	3.19
2,771.60	2,731.66	36.500	122.70	40.09	231.48	175.06	1.89
2,781.20	2,739.35	36.900	122.90	36.99	236.31	180.80	1.30
2,790.90	2,747.14	36.300	122.20	33.87	241.18	186.58	2.26
2,800.60	2,754.94	36.600	122.40	30.80	246.05	192.34	1.00
2,810.20	2,762.65	36.600	121.80	27.75	250.90	198.07	1.12
2,819.90	2,770.47	36.000	121.00	24.76	255.80	203.81	2.36
2,829.60	2,778.36	35.100	118.90	21.95	260.69	209.45	4.69
2,839.30	2,786.29	35.300	119.10	19.23	265.58	215.03	0.71
2,848.90	2,794.11	35.600	120.30	16.48	270.41	220.59	2.37

2,858.60	2,801.97	36.000	119.40	13.65	275.33	226.26	2.04
2,868.30	2,809.98	36.300	120.30	10.80	280.30	231.98	1.89
2,877.80	2,817.49	35.800	120.90	7.96	285.11	237.57	1.93
2,887.30	2,825.19	35.800	119.50	5.16	289.91	243.12	2.59
2,896.80	2,832.87	36.300	120.50	2.37	294.75	248.71	2.44
2,906.40	2,840.58	36.900	120.30	-0.53	299.69	254.43	1.91
2,915.90	2,848.20	36.500	119.90	-3.38	304.60	260.11	1.47
2,925.50	2,855.95	35.800	118.40	-6.14	309.55	265.76	3.53
2,935.20	2,863.82	35.700	119.30	-8.87	314.51	271.42	1.66
2,944.90	2,871.68	36.000	119.60	-11.66	319.46	277.10	1.08
2,954.60	2,879.50	36.600	119.60	-14.50	324.45	282.83	1.86
2,964.30	2,887.32	36.000	119.30	-17.32	329.45	288.57	1.94
2,974.00	2,895.17	35.900	119.10	-20.10	334.42	294.26	0.48
2,983.00	2,902.45	36.100	119.20	-22.68	339.04	299.54	0.69
3,000.00	2,916.19	36.100	120.00	-27.63	347.75	309.55	0.83

Directional Survey Points

Storage Units: Metric

Survey Type: magnetic / single shot

Measured Depth	T.V.D.	Drift Angle (°)	Azimuth (°)	+N / -S Distance	+E / -W Distance	Vertical Section	DogLeg Severity
221.00	221.00	0.250	1.70	0.48	0.02	0.28	0.03
306.00	306.00	1.250	311.70	1.28	-0.67	0.14	0.40
425.00	424.90	2.000	296.70	3.08	-3.50	-1.23	0.22
513.00	512.90	3.750	71.70	4.68	-2.14	0.79	1.85
538.00	537.80	4.350	51.70	5.52	-0.62	2.52	1.86
573.00	572.70	4.100	47.69	7.18	1.35	5.08	0.34
611.00	610.60	4.500	42.69	9.20	3.37	7.87	0.44
642.00	641.50	4.000	41.79	10.89	4.91	10.09	0.50
676.00	675.50	3.500	30.80	12.67	6.23	12.17	0.78
702.00	701.40	3.000	30.69	13.94	6.99	13.50	0.59
742.00	741.36	3.250	32.00	15.80	8.12	15.47	0.20
791.00	790.28	3.250	37.00	18.09	9.69	18.04	0.17
913.00	912.04	4.000	49.00	23.64	14.99	25.51	0.26
961.00	959.93	3.870	41.00	25.96	17.31	28.73	0.35
1,027.00	1,025.77	4.000	38.00	29.46	20.19	33.06	0.11
1,103.00	1,101.59	4.000	32.00	33.79	23.23	37.98	0.16
1,159.00	1,157.42	4.870	35.00	37.40	25.63	41.96	48.00
1,219.00	1,217.20	5.000	56.00	40.94	29.26	46.94	0.90
1,248.00	1,246.08	5.500	59.00	42.36	31.50	49.60	0.59
1,286.00	1,283.85	7.000	57.00	44.56	35.00	53.73	1.20
1,324.00	1,321.54	7.750	55.00	47.29	39.04	58.61	0.63

Directional Survey Points

Storage Units: Metric

Survey Type: electronic / MWD

Measured Depth	T.V.D.	Drift Angle (°)	Azimuth (°)	+N / -S Distance	+E / -W Distance	Vertical Section	DogLeg Severity
1,359.50	1,356.71	7.900	59.60	49.93	43.12	63.46	0.54
1,369.00	1,366.11	8.500	60.50	50.61	44.29	64.82	1.94
1,388.10	1,384.97	9.800	62.50	52.06	46.96	67.84	2.10
1,397.70	1,394.42	10.500	61.80	52.85	48.46	69.53	2.22
1,407.30	1,403.84	11.300	62.20	53.70	50.06	71.33	2.51
1,416.90	1,413.25	11.900	62.60	54.59	51.77	73.25	1.89
1,436.00	1,431.94	12.000	62.90	56.37	55.27	77.16	0.18
1,455.00	1,450.56	10.900	56.70	58.26	58.53	80.92	2.60
1,484.00	1,479.11	9.200	50.90	61.23	62.63	85.97	2.04
1,502.00	1,496.88	9.000	52.60	63.02	64.88	88.84	0.56
1,512.70	1,507.45	8.900	55.00	64.00	66.23	90.50	1.08
1,541.40	1,535.86	7.300	59.70	66.20	69.62	94.54	1.81
1,570.20	1,564.46	6.300	56.70	67.99	72.52	97.95	1.11
1,598.90	1,593.01	5.600	52.20	69.71	74.94	100.92	0.88
1,627.60	1,621.58	5.200	60.20	71.21	77.18	103.62	0.89
1,656.40	1,650.29	3.900	68.20	72.23	79.22	105.88	1.50
1,665.90	1,659.77	3.600	67.20	72.46	79.79	106.49	0.97
1,675.50	1,669.35	3.700	64.60	72.71	80.35	107.09	0.60
1,685.10	1,678.93	3.700	66.10	72.97	80.92	107.70	0.30
1,713.80	1,707.57	3.400	80.70	73.48	82.60	109.39	0.99
1,733.00	1,726.73	4.200	74.30	73.76	83.84	110.58	1.41
1,752.20	1,745.87	5.100	63.40	74.34	85.28	112.10	1.96
1,780.90	1,774.47	4.600	50.90	75.63	87.31	114.51	1.22
1,790.40	1,783.94	4.700	49.40	76.13	87.91	115.28	0.50
1,819.10	1,812.54	4.800	59.60	77.50	89.83	117.64	0.89
1,838.30	1,831.68	4.500	67.60	78.19	91.22	119.19	1.12
1,857.50	1,850.82	4.500	69.90	78.74	92.63	120.66	0.28
1,886.20	1,879.43	4.400	72.30	79.46	94.73	122.81	0.22
1,915.00	1,908.15	4.200	73.30	80.10	96.80	124.89	0.22
1,943.80	1,936.88	3.700	70.90	80.71	98.68	126.80	0.55
1,953.30	1,946.36	3.800	70.40	80.91	99.27	127.40	0.33
1,972.50	1,965.52	3.800	62.80	81.42	100.44	128.65	0.79
2,001.20	1,994.16	3.700	56.10	82.37	102.05	130.53	0.47
2,030.00	2,022.90	3.400	63.60	83.27	103.59	132.32	0.58
2,049.10	2,041.97	3.400	59.50	83.81	104.58	133.44	0.38

Directional Survey Points

Storage Units: Metric

Survey Type: electronic / MWD

Measured Depth	T.V.D.	Drift Angle (°)	Azimuth (°)	+N / -S Distance	+E / -W Distance	Vertical Section	DogLeg Severity
2,058.70	2,051.55	3.500	61.70	84.09	105.08	134.02	0.52
2,077.80	2,070.61	3.700	75.60	84.52	106.19	135.18	1.40
2,087.40	2,080.19	3.900	79.30	84.66	106.82	135.78	0.99
2,116.20	2,108.93	3.800	90.30	84.83	108.73	137.47	0.78
2,144.50	2,137.15	4.500	85.70	84.91	110.78	139.21	0.82
2,173.30	2,165.85	5.300	72.40	85.40	113.17	50.72	1.44
2,202.00	2,194.39	6.600	60.60	86.61	115.87	52.37	1.86
2,221.20	2,213.48	5.800	60.70	87.63	117.68	53.36	1.25
2,230.70	2,222.93	5.600	60.70	88.09	118.50	53.82	0.63
2,259.50	2,251.63	4.000	52.10	89.39	120.52	54.84	1.82
2,269.00	2,261.12	3.000	40.20	89.79	120.79	54.99	3.89
2,288.20	2,280.29	2.800	25.30	90.59	121.47	55.00	1.21
2,307.30	2,299.36	3.200	22.90	91.51	121.87	54.86	0.66
2,316.90	2,308.95	3.400	27.80	92.01	122.11	54.80	1.08
2,326.40	2,318.40	3.900	32.00	92.53	122.41	54.98	1.79
2,335.90	2,327.90	4.400	34.80	93.10	122.79	54.80	1.70
2,355.10	2,347.04	4.900	49.20	94.24	123.83	55.08	1.98
2,374.30	2,366.16	5.400	59.50	95.24	125.23	55.74	1.64
2,384.00	2,375.82	5.700	62.20	95.69	126.05	56.19	1.23
2,393.70	2,385.47	5.500	64.20	96.12	126.90	56.68	0.86
2,403.30	2,395.03	5.500	68.80	96.49	127.74	57.20	1.38
2,413.10	2,404.79	5.300	69.40	96.82	128.60	57.76	0.64
2,422.70	2,414.35	5.200	69.50	97.12	129.42	58.29	0.31
2,432.40	2,424.00	5.300	68.10	97.44	130.25	58.82	0.50
2,442.00	2,433.56	5.200	66.50	97.78	131.06	163.24	0.55
2,461.40	2,452.89	4.700	60.00	98.53	132.56	164.89	1.16
2,471.00	2,462.46	4.500	62.30	98.90	133.23	165.66	0.85
2,484.00	2,475.42	4.400	62.60	99.37	134.13	166.67	0.24

Directional Survey Points

Storage Units: Metric

Survey Type: electronic / MWD

Measured Depth	T.V.D.	Drift Angle (°)	Azimuth (°)	+N / -S Distance	+E / -W Distance	Vertical Section	DogLeg Severity
2,510.00	2,501.34	4.600	71.00	100.17	136.00	62.26	0.79
2,519.60	2,510.90	5.700	91.90	100.28	136.84	62.91	6.74
2,529.30	2,520.54	7.200	103.30	100.12	137.91	63.90	6.08
2,539.00	2,530.14	9.400	107.90	99.74	139.26	65.24	7.10
2,548.60	2,539.59	11.000	112.50	99.15	140.85	66.91	5.61
2,558.30	2,549.07	13.500	115.90	98.30	142.72	68.94	8.04
2,569.70	2,560.12	15.000	120.40	96.97	145.19	71.74	4.90
2,579.30	2,569.36	16.100	122.50	95.63	147.39	74.32	3.86
2,588.80	2,578.44	18.200	126.60	94.03	149.69	77.11	7.65
2,598.40	2,587.51	20.300	129.00	92.09	152.19	80.26	7.01
2,608.00	2,596.44	22.600	128.80	89.89	154.92	83.75	7.19
2,617.50	2,605.12	15.300	129.00	87.47	157.92	87.57	8.53
2,626.90	2,613.53	27.800	128.60	84.83	161.19	91.74	8.00
2,636.40	2,621.85	29.800	126.40	82.05	164.83	96.30	7.15
2,646.00	2,630.10	31.900	123.90	79.22	168.85	101.21	7.69
2,655.60	2,638.16	33.900	123.20	76.34	173.20	106.43	6.36
2,665.20	2,646.02	36.000	122.40	73.36	177.82	111.92	6.72
2,674.80	2,653.75	36.800	121.10	70.36	182.66	117.62	3.47
2,684.50	2,661.50	37.100	120.60	67.37	187.67	123.45	1.31
2,694.20	2,669.22	37.400	121.80	64.33	192.69	129.32	2.43
2,703.90	2,676.97	36.700	122.50	61.22	197.64	135.17	2.53
2,713.50	2,684.70	35.900	121.40	58.21	202.46	140.85	3.22
2,723.20	2,692.57	35.600	120.60	55.30	207.32	146.52	1.72
2,732.90	2,700.46	35.700	121.30	52.39	212.17	152.17	1.30
2,742.60	2,708.31	36.200	122.70	49.37	217.00	157.86	2.98
2,752.20	2,716.04	36.600	123.40	46.26	221.77	163.56	1.80
2,761.90	2,723.84	36.200	121.80	43.16	226.62	169.31	3.19
2,771.60	2,731.66	36.500	122.70	40.09	231.48	175.06	1.89
2,781.20	2,739.35	36.900	122.90	36.99	236.31	180.80	1.30
2,790.90	2,747.14	36.300	122.20	33.87	241.18	186.58	2.26
2,800.60	2,754.94	36.600	122.40	30.80	246.05	192.34	1.00
2,810.20	2,762.65	36.600	121.80	27.75	250.90	198.07	1.12
2,819.90	2,770.47	36.000	121.00	24.76	255.80	203.81	2.36
2,829.60	2,778.36	35.100	118.90	21.95	260.69	209.45	4.69
2,839.30	2,786.29	35.300	119.10	19.23	265.58	215.03	0.71

Directional Survey Points

Storage Units: Metric

Survey Type: electronic / MWD

Measured Depth	T.V.D.	Drift Angle (°)	Azimuth (°)	+N / -S Distance	+E / -W Distance	Vertical Section	DogLeg Severity
2,848.90	2,794.11	35.600	120.30	16.48	270.41	220.59	2.37
2,858.60	2,801.97	36.000	119.40	13.65	275.33	226.26	2.04
2,868.30	2,809.98	36.300	120.30	10.80	280.30	231.98	1.89
2,877.80	2,817.49	35.800	120.90	7.96	285.11	237.57	1.93
2,887.30	2,825.19	35.800	119.50	5.16	289.91	243.12	2.59
2,896.80	2,832.87	36.300	120.50	2.37	294.75	248.71	2.44
2,906.40	2,840.58	36.900	120.30	-0.53	299.69	254.43	1.91
2,915.90	2,848.20	36.500	119.90	-3.38	304.60	260.11	1.47
2,925.50	2,855.95	35.800	118.40	-6.14	309.55	265.76	3.53
2,935.20	2,863.82	35.700	119.30	-8.87	314.51	271.42	1.66
2,944.90	2,871.68	36.000	119.60	-11.66	319.46	277.10	1.08
2,954.60	2,879.50	36.600	119.60	-14.50	324.45	282.83	1.86
2,964.30	2,887.32	36.000	119.30	-17.32	329.45	288.57	1.94
2,974.00	2,895.17	35.900	119.10	-20.10	334.42	294.26	0.48
2,983.00	2,902.45	36.100	119.20	-22.68	339.04	299.54	0.69
3,000.00	2,916.19	36.100	120.00	-27.63	347.75	309.55	0.83

Deviation Survey Points

Storage Units: Metric

Survey Type: magnetic / single shot

Measured Depth	rift Angle (°)	Azimuth (°)	Measured Depth	Drift Angle (°)	Azimuth (°)
221.00	0.250	1.70			
306.00	1.250	311.70			
425.00	2.000	296.70			
513.00	3.750	71.70			
538.00	4.350	51.70			
573.00	4.100	47.69			
611.00	4.500	42.69			
642.00	4.000	41.79			
676.00	3.500	30.80			
702.00	3.000	30.69			
742.00	3.250	32.00			
791.00	3.250	37.00			
913.00	4.000	49.00			
961.00	3.870	41.00			
1,027.00	4.000	38.00			
1,103.00	4.000	32.00			
1,159.00	4.870	35.00			
1,219.00	5.000	56.00			
1,248.00	5.500	59.00			
1,286.00	7.000	57.00			
1,324.00	7.750	55.00			

Deviation Survey Points

Storage Units: Metric

Survey Type: electronic / MWD

Measured Depth	rift Angle (°)	Azimuth (°)	Measured Depth	Drift Angle (°)	Azimuth (°)
1,359.50	7.900	59.60	2,058.70	3.500	61.70
1,369.00	8.500	60.50	2,077.80	3.700	75.60
1,388.10	9.800	62.50	2,087.40	3.900	79.30
1,397.70	10.500	61.80	2,116.20	3.800	90.30
1,407.30	11.300	62.20	2,144.50	4.500	85.70
1,416.90	11.900	62.60	2,173.30	5.300	72.40
1,436.00	12.000	62.90	2,202.00	6.600	60.60
1,455.00	10.900	56.70	2,221.20	5.800	60.70
1,484.00	9.200	50.90	2,230.70	5.600	60.70
1,502.00	9.000	52.60	2,259.50	4.000	52.10
1,512.70	8.900	55.00	2,269.00	3.000	40.20
1,541.40	7.300	59.70	2,288.20	2.800	25.30
1,570.20	6.300	56.70	2,307.30	3.200	22.90
1,598.90	5.600	52.20	2,316.90	3.400	27.80
1,627.60	5.200	60.20	2,326.40	3.900	32.00
1,656.40	3.900	68.20	2,335.90	4.400	34.80
1,665.90	3.600	67.20	2,355.10	4.900	49.20
1,675.50	3.700	64.60	2,374.30	5.400	59.50
1,685.10	3.700	66.10	2,384.00	5.700	62.20
1,713.80	3.400	80.70	2,393.70	5.500	64.20
1,733.00	4.200	74.30	2,403.30	5.500	68.80
1,752.20	5.100	63.40	2,413.10	5.300	69.40
1,780.90	4.600	50.90	2,422.70	5.200	69.50
1,790.40	4.700	49.40	2,432.40	5.300	68.10
1,819.10	4.800	59.60	2,442.00	5.200	66.50
1,838.30	4.500	67.60	2,461.40	4.700	60.00
1,857.50	4.500	69.90	2,471.00	4.500	62.30
1,886.20	4.400	72.30	2,484.00	4.400	62.60
1,915.00	4.200	73.30			
1,943.80	3.700	70.90			
1,953.30	3.800	70.40			
1,972.50	3.800	62.80			
2,001.20	3.700	56.10			
2,030.00	3.400	63.60			
2,049.10	3.400	59.50			

Deviation Survey Points

Storage Units: Metric

Survey Type: electronic / MWD

Measured Depth	rift Angle (°)	Azimuth (°)	Measured Depth	Drift Angle (°)	Azimuth (°)
2,510.00	4.600	71.00	2,848.90	35.600	120.30
2,519.60	5.700	91.90	2,858.60	36.000	119.40
2,529.30	7.200	103.30	2,868.30	36.300	120.30
2,539.00	9.400	107.90	2,877.80	35.800	120.90
2,548.60	11.000	112.50	2,887.30	35.800	119.50
2,558.30	13.500	115.90	2,896.80	36.300	120.50
2,569.70	15.000	120.40	2,906.40	36.900	120.30
2,579.30	16.100	122.50	2,915.90	36.500	119.90
2,588.80	18.200	126.60	2,925.50	35.800	118.40
2,598.40	20.300	129.00	2,935.20	35.700	119.30
2,608.00	22.600	128.80	2,944.90	36.000	119.60
2,617.50	15.300	129.00	2,954.60	36.600	119.60
2,626.90	27.800	128.60	2,964.30	36.000	119.30
2,636.40	29.800	126.40	2,974.00	35.900	119.10
2,646.00	31.900	123.90	2,983.00	36.100	119.20
2,655.60	33.900	123.20	3,000.00	36.100	120.00
2,665.20	36.000	122.40			
2,674.80	36.800	121.10			
2,684.50	37.100	120.60			
2,694.20	37.400	121.80			
2,703.90	36.700	122.50			
2,713.50	35.900	121.40			
2,723.20	35.600	120.60			
2,732.90	35.700	121.30			
2,742.60	36.200	122.70			
2,752.20	36.600	123.40			
2,761.90	36.200	121.80			
2,771.60	36.500	122.70			
2,781.20	36.900	122.90			
2,790.90	36.300	122.20			
2,800.60	36.600	122.40			
2,810.20	36.600	121.80			
2,819.90	36.000	121.00			
2,829.60	35.100	118.90			
2,839.30	35.300	119.10			

Drilling Fluid Summary

Storage Units: Metric

Drilling Fluid Type:	Gel Chem Spud Mud	**From:**	0	**To:**	711
Drilling Fluid Type:	Oil based Invert	**From:**	771	**To:**	2,500
Drilling Fluid Type:	Gel Chem	**From:**	2,500	**To:**	3,000

Company:	Lillico Petroleum Consultants			
Geologist:	**Brock Lillico**			
Work Performed	**From:**	Feb 16, 1999	**To:**	Mar 28, 1999
Depths Logged	**From:**	700	**To:**	3,000
Remarks:				

Company:	Lillico Petroleum Consultants			
Geologist:	**Cathy Lillico**			
Work Performed	**From:**	Mar 12, 1999	**To:**	Mar 28, 1999
Depths Logged	**From:**	2,427	**To:**	3,000
Remarks:	FID and TCD Gas Chromatograph, plus FID and CC Total Gas Detector.			

Formation Top Summary

Storage Units: Metric

Kelly Bushing Elevation: 418.80 **Casing Flange Elevation:**
Ground Elevation: 409.60

***** All Depths measured from Kelly Bushing Elevation *****

Group *Formation* Member	Prognosis (TVD)	Sample Top (MD)	Sample Top (TVD)	Log Top (MD)	Log Top (TVD)	Subsea	Thickness
Thrust Fault Besa Rive	2,900.00					-2,481.20	-2,600.00
BESA RIVER	300.00	300.00	300.00			118.80	891.30
Exshaw 1st Black Shal	1,340.00	1,193.00	1,191.30	1,206.00	1,204.25	-785.45	361.05
LOWER BESA RIVER	1,669.00	1,567.00	1,561.30	1,571.00	1,565.30	-1,146.50	641.00
Muskwa 2nd Black Sha	2,340.00	2,219.00	2,211.30	2,214.00	2,206.30	-1,787.50	276.10
NAHANNI	2,565.00	2,484.00	2,475.40	2,491.00	2,482.40	-2,063.60	

Kelly Bushing Elevation: 418.80 **Casing Flange Elevation:**
Ground Elevation: 409.60
All Depths Measured from Kelly Bushing Elevation

Group:
Formation: BESA RIVER
Member:
Boundary Type: conformable
Fault Type:

Era: Paleozoic
Series:
Period: Mississippian
Stage:
Age (Approx): Million years.

	Measured Depth	True Vertical Depth	Subsea	Thickness
Sample Top	300.00	300.00	118.80	891.30
Log Top				

Evaluation:

The Besa River is SHALE, medium gray to medium green gray, dark gray in part, micromicaceous, fissile, splintery, slightly calcareous, slightly fossiliferous with trace shell fragments, trace Crinoids, trace Brachiopods, trace open fractures with sparry calcite crystals, trace pyrite, trace blocky medium gray Marlstone stringers, trace Limestone stringers, medium brown, cryptocrystalline, slightly argillaceous, tight, no shows. The section at 1024-1046m had streaks of LIMESTONE, medium brown, microcrystalline to very fine crystalline, argillaceous to marly, tight, no shows. The section at 987-1010m had microfractures with a significant gas increase. Background gas rose from 0.2% to a range of 8% to 15%. The gas behaved like low volume fracture gas and bled off after 100 meters of drilling. Other gas peaks in the Besa River were at 770m .7%, 890m 1.05%, and 897m .585%

Conclusion:

The Besa River Shale has poor potential for hydrocarbon production.

Group:
Formation: Exshaw 1st Black Shale
Member:
Boundary Type: conformable
Fault Type:

Era:
Series:
Period: Mississippian
Stage:
Age (Approx): Million years.

	Measured Depth	True Vertical Depth	Subsea	Thickness
Sample Top	1,193.00	1,191.30	-772.50	370.00
Log Top	1,206.00	1,204.25	-785.45	361.05

Evaluation:

The First Black Shale is SHALE: dark gray to dark brown gray to black, micromicaceous, fissile, slightly bituminous, scattered loose pyrite, trace disseminated microcrystalline pyrite, Marlstone stringers, medium to dark gray, cryptocrystalline, calcareous, tight, no shows, minor microfractures with trace anhydrite infill, trace slickenside, rare trace very coarse hexagonal quartz crystal fragments. A hard section of Ironstone and sideritic Marlstone was present at 1514-1522m which wiped a drillbit out at 1518m. Background gas ranged from 1% to 9.5% while drilling the bituminous 1st Black Shale.

Conclusion:

The 1st Black Shale has very poor hydrocarbon production potential, however, the zone looks like a good source rock.

Kelly Bushing Elevation: 418.80 **Casing Flange Elevation:**
Ground Elevation: 409.60
All Depths Measured from Kelly Bushing Elevation

Group: **Era:**
Formation: LOWER BESA RIVER **Series:**
Member: **Period:** Devonian
Boundary Type: conformable **Stage:**
Fault Type: **Age (Approx):** Million years.

	Measured Depth	True Vertical Depth	Subsea	Thickness
Sample Top	1,567.00	1,561.30	-1,142.50	650.00
Log Top	1,571.00	1,565.30	-1,146.50	641.00

Evaluation:

The Lower Besa River is SHALE, mainly medium gray, trace dark gray, grading to medium green gray in part, micromicaceous, fissile, moderately soft, slightly calcareous to marly in part, silty in part with increasing silt content and Siltstone laminations near lower part of interval, slightly bituminous, trace fossil remnants, pearly lustre in part, minor disseminated pyrite, trace microfractures, trace slickensides. At 1670-1685m is interbedded Ironstone, dark gray brown, argillaceous, marly, hard, and SHALE, dark gray brown, sideritic to very sideritic, marly, well indurated. At 1770-1820m is SHALE, dark gray to black, micromicaceous, fissile, bituminous, pyritic in part with trace pyritized spicules, trace siderite, interbedded SHALE, medium to dark gray, micromicaceous, fissile, very sideritic and hard in part, slightly bituminous in part, minor Ironstone streaks, dark gray brown, argillaceous, hard. Background gas over the interval 1567-2023m ranged from .6% to 2% with higher gas through the bits interval at 1770-1820m ranging from 1% to 4%. At 2023m a significant increase happened with background gas jumping to 7.5% at 2025m and slowly tapered off after that, dropping down to 2.5% by the 2nd Black Shale.

Conclusion:

The Lower Besa River has little hydrocarbon production potential.

Group: **Era:**
Formation: Muskwa 2nd Black Shale **Series:**
Member: **Period:** Devonian
Boundary Type: conformable **Stage:**
Fault Type: **Age (Approx):** Million years.

	Measured Depth	True Vertical Depth	Subsea	Thickness
Sample Top	2,219.00	2,211.30	-1,792.50	264.10
Log Top	2,214.00	2,206.30	-1,787.50	276.10

Evaluation:

The Second Black Shale is interbedded very hard siliceous Shale and softer bituminous Shale. SHALE, dark gray to black, micromicaceous, fissile to blocky in part, dolomitic in part, siliceous and very hard in part, trace conchoidal fracture, slightly bituminous, trace dolomite cemented microfractures, rare trace open microfractures with quartz crystals lining fracture plane, trace fracture porosity at 2259-2290m and at 2318m, very pyritic with abundant disseminated microcrystalline pyrite at the top of the zone, trace Marlstone, very dark gray to black, dolomitic, hard, tight, trace black argillaceous Chert, trace SHALE, dark brown gray to black, moderately soft, very bituminous, slightly calcareous with scattered calcareous white specks in part increasing towards base of interval. Background gas through the upper section, at 2219-2259m ranged from 2% to 3% with a light mud weight of 1025kg/m3. At 2259-2290m a fractured, gas charged section had readings of 4% to 11.8%. Mud weight

Kelly Bushing Elevation: 418.80 Casing Flange Elevation:
Ground Elevation: 409.60
All Depths Measured from Kelly Bushing Elevation

was increased to to 1230kg/m3 to control gas levels. The remainder of the shale, with mud weights ranging from 1230-1255kg/m3, gas levels varied from 1.5% to 3% with peaks at 2360m 4.2%, and at 2392m 5.7%.

Conclusion:

The Second Black Shale has potential for gas production from fractures in shale, and looks like a good source rock. This combination of good source potential and fractures may help feed the primary objective Nahanni Formation.

Group:
Formation: NAHANNI
Member:
Boundary Type: conformable
Fault Type:

Era:
Series:
Period: Devonian
Stage:
Age (Approx): Million years.

	Measured Depth	True Vertical Depth	Subsea	Thickness
Sample Top	2,484.00	2,475.40	-2,056.60	
Log Top	2,491.00	2,482.40	-2,063.60	

Evaluation:

The Nahanni is Dolomite; light to medium gray, to medium brown gray in part, fine to medium crystalline with scattered coarse to very coarse white Dolomite crystals, trace fossil shadows (circular, Amphipora? Coral? Crinoid?), trace poor intercrystalline porosity with scattered pyrobitumen plugging, poor vug and fracture porosity in part, no fluorescence, trace clear quartz crystals, trace stylolites, medium to very coarse crystalline drusy Dolomite rhombs and rosettes, trace microfractures with white Dolomite veins, trace twinned Dolomite crystals. Fossil shadows seen in samples at 2570-2650m may be reefal. The is siliceous at 2625-3000m with pseudomorphs and silty residue. Thin Shale streaks showed up at 2700-2980m Shale, medium green to gray green, dark gray green in part, waxy in part, pyritic with disseminated microcrystalline pyrite. At the base of the well, at 2985-3000m Chert was present, medium to dark gray, hard. At 2635-2640m is LIMESTONE, medium gray brown, cryptocrystalline, clean, slightly fossiliferous, tight, no shows, scattered stylolites, trace disseminated pyrite. Intermediate Casing was set 16 meters into the zone at 2500m. After casing the well was drilled out with a water base gel-chem mud at 1050kg/m3 density. Background drilled gas over the interval 2484-2512m ranged from 1.75% to 4.66%. At 2513m, background gas climbed to 11%, mud weight was increased to 1120kg/m3 to control gas influx. Interval 2513-2605m gas ranged from .3% to 11.2% with mud weight at 1085 to 1120kg/m3. At 2606-2700m gas ranged from .4% to 3.72% with mud weights of 1105-1110kg/m3. The Lower section at 2700-3000m gas ranged from .1% to 1.0% with a peak at 2743m of 4.54% (mud weight at 1115-1140kg/m3). The best looking sections from sample and background gas data are 2510-2570m, and a white coarse crystalline Dolomite at 2640-2700m.

Conclusion:

The Nahanni has good potential for gas production. The intercrystalline porosity is streaky and plugged with pyrobitumen, however, throughout the Nahanni there is evidence of vug and / or fracture porosity with large drusy Dolomite rhombs and rosettes to 5mm, also hexagonal quartz crystals to 5mm. If these large pore spaces are connected, the Nahanni has excellent potential.

711.00 to 715.00 (4.00)	**SHALE** medium gray to green gray, fissile, splintery, micromicaceous, slightly calcareous in part, trace pyrite, trace calcite viens, rare trace sparry calcite crystals along flat fracture planes, trace Limestone stringers
715.00 to 720.00 (5.00)	**SHALE** as above, slightly calcareous in part, trace microfractures with calcite infilling, trace siderite
720.00 to 725.00 (5.00)	**SHALE** medium gray to medium green gray, dark gray in part, micromicaceous, fissile, splintery, slightly calcareous, slightly fossiliferous, trace iron filings (surface casing)
725.00 to 730.00 (5.00)	**SHALE** as above, mainly medium gray to green gray, slightly fossiliferous, trace Crinoids, trace pyrite
730.00 to 735.00 (5.00)	**SHALE** medium gray to green gray, micromicaceous, fissile, splintery, slightly calcareous in part, fossiliferous with trace shell fragments, trace pyrite
735.00 to 740.00 (5.00)	**SHALE** medium gray to medium green gray, dark gray in part, micromicaceous, fissile, slightly fossiliferous, trace blocky medium gray Marlstone stringers, trace pyrite
740.00 to 745.00 (5.00)	**SHALE** as above, fissile in part, slightly calcareous and blocky in part, trace fossil remnants, trace pyrite, trace iron filings (casing)
745.00 to 750.00 (5.00)	**SHALE** medium gray to medium green gray, micromicaceous, slightly calcareous in part, fissile to blocky in part, trace pyrite
750.00 to 755.00 (5.00)	**SHALE** as above, medium gray to medium green gray, slightly calcareous, fissile, micromicaceous, increasing Limestone stringers
755.00 to 760.00 (5.00)	**SHALE** mainly medium gray, micromicaceous, fissile, slightly calcareous in part
760.00 to 765.00 (5.00)	**SHALE** medium gray to green gray, micromicaceous, fissile, slightly calcareous and blocky in part, trace microfractures
765.00 to 770.00 (5.00)	**SHALE** as above, medium gray to green gray, trace microfractures, calcite healed in part, trace Limestone stringers
770.00 to 775.00 (5.00)	**SHALE** medium gray, dark gray in part, micromicaceous, fissile, increasing calcite filled microfractures, trace Limestone stringers, medium brown, cryptocrystalline, slightly argillaceous, tight, no shows

775.00 to 780.00 (5.00)	**SHALE** medium to dark gray as above, green gray in part, fissile, micromicaceous, slightly calcareous, trace open fractures with sparry calcite crystals, trace pyrite
780.00 to 785.00 (5.00)	**SHALE** mainly medium gray, medium green gray in part, micromicaceous, fissile, slightly calcareous in part, trace Limestone stringers
785.00 to 790.00 (5.00)	**SHALE** as above, medium gray, fissile, micromicaceous, slightly calcareous, trace Limestone stringers
790.00 to 795.00 (5.00)	**SHALE** medium gray to green gray, micromicaceous, fissile, slightly calcareous in part, trace slickenside, trace iron filings (casing)
795.00 to 800.00 (5.00)	**SHALE** medium gray to green gray, mainly fissile, blocky in part, micromicaceous, fossiliferous with trace Brachiopods, trace pyrite, trace slickenside
800.00 to 805.00 (5.00)	**SHALE** as above, slightly fossiliferous, trace Brachiopods, slightly calcareous, trace pyrite
805.00 to 810.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, slightly calcareous in part, trace calcite veins, trace iron filings
810.00 to 815.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, slightly fossiliferous, slightly calcareous in part
815.00 to 820.00 (5.00)	**SHALE** as above, medium gray, slightly calcareous in part, trace Limestone stringers, medium gray brown, cryptocrystalline, slightly argillaceous, tight, no shows, trace pyrite
820.00 to 825.00 (5.00)	**SHALE** medium gray to medium green gray in part, micromicaceous, fissile, slightly calcareous in part, slightly fossiliferous, trace slickenside
825.00 to 830.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, trace calcite filled microfractures
830.00 to 835.00 (5.00)	**SHALE** mainly medium gray, micromicaceous, fissile, blocky in part, slightly bentonitic in part
835.00 to 840.00 (5.00)	**SHALE** medium gray as above, minor calcareous veins to 2mm
840.00 to 845.00 (5.00)	**SHALE** medium gray, green gray in part, dark gray in part, micromicaceous, fissile, blocky in part, slightly fossiliferous, trace microfractures, trace pyrite

845.00 to 850.00 (5.00)	**SHALE** as above, scattered slickenside, trace Limestone stringers, trace iron filings
850.00 to 855.00 (5.00)	**SHALE** medium gray, dark gray in part, medium brown gray in part, micromicaceous, fissile, slightly fossiliferous, scattered slickenside
855.00 to 860.00 (5.00)	**SHALE** as above, slightly fossiliferous, trace slickenside
860.00 to 865.00 (5.00)	**SHALE** mainly medium gray, to dark gray in part, micromicaceous, fissile, slightly fossiliferous, trace calcite veins
865.00 to 870.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, trace slickenside, trace Limestone stringers, trace iron filings (casing)
870.00 to 875.00 (5.00)	**SHALE** as above, mainly medium gray, medium green gray in part, micromicaceous, fissile
875.00 to 880.00 (5.00)	**SHALE** mainly medium gray, dark gray in part, interlaminated in part, micromicaceous, fissile, trace calcite filled microfractures, trace slickenside
880.00 to 885.00 (5.00)	**SHALE** as above, slightly fossiliferous with trace shell fragments, trace slickenside
885.00 to 890.00 (5.00)	**SHALE** medium gray to medium green gray, micromicaceous, fissile, slightly fossiliferous, trace slickenside
890.00 to 895.00 (5.00)	**SHALE** as above, micromicaceous, fissile, fossiliferous, trace pyrite
895.00 to 900.00 (5.00)	**SHALE** medium to dark gray, green gray in part, micromicaceous, fissile, trace Limestone stringers
900.00 to 905.00 (5.00)	**SHALE** as above, trace slickenside, trace Limestone stringers, medium brown, microcrystalline to very fine crystalline, tight, no shows
905.00 to 910.00 (5.00)	**SHALE** medium gray to green gray, dark gray in part, micromicaceous, fissile, trace slickenside
910.00 to 915.00 (5.00)	**SHALE** as above, slightly fossiliferous, trace Limestone stringers

915.00 to 920.00 (5.00)	**SHALE** medium gray to medium green gray, interlaminated dark gray in part, micromicaceous, fissile, slightly fossiliferous, scattered slickenside
920.00 to 925.00 (5.00)	**SHALE** as above, medium to dark gray in part, micromicaceous, fissile, trace microfractures
925.00 to 930.00 (5.00)	**SHALE** medium gray to medium green gray as above, trace dark gray, micromicaceous, fissile, trace microfractures, trace sparry calcite crystals (open fractures?)
930.00 to 935.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly fossiliferous, trace shell fragments, trace microfractures, trace iron filings
935.00 to 940.00 (5.00)	**SHALE** as above, micromicaceous, fissile, slightly fossiliferous
940.00 to 945.00 (5.00)	**SHALE** medium gray as above with increasing dark gray Shale, micromicaceous, fissile, slightly fossiliferous, trace slickenside, trace pyrite
945.00 to 950.00 (5.00)	**SHALE** medium to dark gray, green gray in part, micromicaceous, fissile, slightly fossiliferous, trace microfractures and calcite veins to 2mm, trace slickenside
950.00 to 955.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, splintery in part, moderately soft, slightly calcareous
955.00 to 960.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, trace microfractures and calcite veins to 3mm
960.00 to 965.00 (5.00)	**SHALE** as above, slightly fossiliferous, trace slickenside, trace Limestone stringers
965.00 to 970.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly calcareous in part, slightly fossiliferous
970.00 to 975.00 (5.00)	**SHALE** as above, micromicaceous, slightly calcareous, trace Limestone stringers
975.00 to 980.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly calcareous in part, trace microfractures
980.00 to 985.00 (5.00)	**SHALE** as above, slightly fossiliferous with trace Brachiopods, trace calcite veins

985.00 to 990.00 (5.00)	**SHALE** mainly medium gray as above, trace dark gray, micromicaceous, fissile, slightly fossiliferous, trace Brachiopods, scattered microfractures and calcite veins
990.00 to 995.00 (5.00)	**SHALE** as above, micromicaceous, fissile, calcareous in part, decreasing microfractures, trace Limestone streaks, dark gray brown, cryptocrystalline to microcrystalline, argillaceous, tight, no shows, scattered white calcite veins
995.00 to 1,000.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly calcareous, slightly fossiliferous, trace microfractures
1,000.00 to 1,005.00 (5.00)	**SHALE** as above, trace Limestone stringers
1,005.00 to 1,010.00 (5.00)	**SHALE** medium gray with increasing dark gray, micromicaceous, fissile, slightly calcareous, slightly fossiliferous with trace Crinoids, trace microfractures healed with calcite, trace slickenside
1,010.00 to 1,015.00 (5.00)	**SHALE** as above, rare trace Anhydrite inclusion
1,015.00 to 1,020.00 (5.00)	**SHALE** mainly dark gray, medium gray in part, micromicaceous, fissile, calcareous in part, marly and blocky in part, slightly fossiliferous, trace microfractures cemented with calcite
1,020.00 to 1,025.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile to blocky, becoming calcareous to very calcareous in part, marly, moderately indurated, trace microfractures, minor Limestone, medium brown, microcrystalline to very fine crystalline, argillaceous to marly, tight, no shows
1,025.00 to 1,030.00 (5.00)	**SHALE** medium to dark gray as above, micromicaceous, fissile, calcareous in part, slightly fossiliferous, trace LIMESTONE as above, argillaceous, tight, no shows
1,030.00 to 1,035.00 (5.00)	**SHALE** medium to dark gray, fissile to blocky in part, calcareous, slightly fossiliferous, trace microfractures and calcite veins, trace slickenside, decreasing Limestone as above
1,035.00 to 1,040.00 (5.00)	**SHALE** mainly dark gray, blocky, calcareous to very calcareous, marly, minor calcite healed microfractures, trace Limestone, dark gray brown, cryptocrystalline, very argillaceous grading to Marlstone, tight, no shows
1,040.00 to 1,045.00 (5.00)	**SHALE** dark gray as above, blocky, calcareous to very calcareous, marly, minor calcite healed microfractures, decreasing Limestone as above

1,045.00 to 1,050.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, calcareous in part, trace pyrite
1,050.00 to 1,055.00 (5.00)	**SHALE** medium gray, green gray in part, micromicaceous, fissile, slightly calcareous in part, fossiliferous
1,055.00 to 1,060.00 (5.00)	**SHALE** as above
1,060.00 to 1,065.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, slightly calcareous, trace microfractures
1,065.00 to 1,070.00 (5.00)	**SHALE** mainly medium gray, micromicaceous, fissile to blocky, calcareous to very calcareous in part, marly, trace pyrite
1,070.00 to 1,075.00 (5.00)	**SHALE** mainly medium gray, dark gray in part, micromicaceous, fissile, slightly calcareous in part, trace pyrite
1,075.00 to 1,080.00 (5.00)	**SHALE** medium gray as above, calcareous and marly in part, moderately indurated in part, trace slickenside
1,080.00 to 1,085.00 (5.00)	**SHALE** as above, calcareous in part with very calcareous stringers, slightly fossiliferous
1,085.00 to 1,090.00 (5.00)	**SHALE** medium gray to medium brown gray, micromicaceous, fissile, slightly calcareous, trace pyrite, trace Marlstone stringers
1,090.00 to 1,095.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, blocky in part, slightly calcareous to very calcareous in part, trace microfractures
1,095.00 to 1,100.00 (5.00)	**SHALE** medium gray to brown gray, micromicaceous, fissile, calcareous, trace white calcite filled microfractures
1,100.00 to 1,105.00 (5.00)	**SHALE** mainly medium gray, dark gray in part, brown gray in part, micromicaceous, fissile, slightly calcareous in part
1,105.00 to 1,110.00 (5.00)	**SHALE** as above, trace microfractures
1,110.00 to 1,115.00 (5.00)	**SHALE** mainly medium gray, micromicaceous, fissile, blocky in part, very slightly calcareous in part

1,115.00 to 1,120.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, slightly calcareous in part, trace pyrite
1,120.00 to 1,125.00 (5.00)	**SHALE** as above, well indurated in part, calcareous and blocky in part
1,125.00 to 1,130.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile to blocky, slightly calcareous in part, trace microfractures
1,130.00 to 1,135.00 (5.00)	**SHALE** mainly medium gray, trace dark gray, micromicaceous, fissile, slightly calcareous in part, slightly fossiliferous, trace disseminated pyrite
1,135.00 to 1,140.00 (5.00)	**SHALE** as above, micromicaceous, slightly calcareous, marly
1,140.00 to 1,145.00 (5.00)	**SHALE** as above, slightly calcareous, trace Anhydrite inclusions
1,145.00 to 1,150.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, slightly calcareous, slightly fossiliferous, trace microfractures and calcite veins to 2mm, trace disseminated microcrystalline pyrite
1,150.00 to 1,155.00 (5.00)	**SHALE** as above, slightly calcareous, slightly fossiliferous
1,155.00 to 1,160.00 (5.00)	**SHALE** as above
1,160.00 to 1,165.00 (5.00)	**SHALE** medium gray, medium green gray in part, micromicaceous, fissile to blocky, slightly calcareous
1,165.00 to 1,170.00 (5.00)	**SHALE** as above, mainly medium gray, slightly calcareous, slightly fossiliferous, minor microfractures
1,170.00 to 1,175.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, blocky in part, slightly calcareous to very calcareous in part, marly, slightly fossiliferous, scattered calcite healed microfractures
1,175.00 to 1,180.00 (5.00)	**SHALE** mainly medium gray, trace dark gray, micromicaceous, fissile, calcareous in part, slightly fossiliferous, trace microfractures
1,180.00 to 1,185.00 (5.00)	**SHALE** as above, mainly medium gray, slightly calcareous, trace microfractures

1,185.00 to 1,190.00 (5.00)	**SHALE** dark gray to very dark gray, micromicaceous, fissile, moderately soft, rarely calcareous, slightly bituminous in part
1,190.00 to 1,195.00 (5.00)	**SHALE** mainly dark gray as above, trace medium gray and slightly calcareous, micromicaceous, fissile, slightly bituminous, trace pyrite
1,195.00 to 1,200.00 (5.00)	**SHALE** dark gray to very dark gray, dark brown gray in part, micromicaceous, fissile, slightly bituminous in part, trace pyrite with pyritized spicules in part
1,200.00 to 1,205.00 (5.00)	**SHALE** medium to dark gray, very dark gray to black in part, micromicaceous, fissile, calcareous in part, slightly bituminous in part, microfractures with calcite infill and trace Anhydrite filling in part, minor pyrite
1,205.00 to 1,210.00 (5.00)	**SHALE** as above, medium to dark gray, increasing microfractures with mainly anhydrite infill, scattered pyrite
1,210.00 to 1,220.00 (10.00)	**SHALE** dark gray to very dark gray, micromicaceous, fissile, trace pyrite
1,220.00 to 1,225.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly sideritic
1,225.00 to 1,230.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly sideritic, trace pyrite
1,230.00 to 1,235.00 (5.00)	**SHALE** as above, slightly sideritic, increasing pyrite
1,235.00 to 1,240.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly sideritic in part, minor pyrite, trace microfractures with anhydritic cement
1,240.00 to 1,245.00 (5.00)	**SHALE** dark gray, micromicaceous, fissile, slightly bituminous in part
1,245.00 to 1,250.00 (5.00)	**SHALE** mainly medium gray, decreasing dark gray, micromicaceous, fissile, trace pyrite
1,250.00 to 1,255.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly sideritic in part, trace pyrite
1,255.00 to 1,260.00 (5.00)	**SHALE** as above, trace fossil remnants, trace pyrite
1,260.00 to 1,265.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, minor siderite, trace pyrite

1,265.00 to 1,270.00 (5.00)	**SHALE** medium to dark gray as above, micromicaceous, fissile, minor disseminated pyrite
1,270.00 to 1,275.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, minor pyrite
1,275.00 to 1,280.00 (5.00)	**SHALE** medium to dark gray as above
1,280.00 to 1,285.00 (5.00)	**SHALE** mainly dark gray, micromicaceous, fissile, trace fossil remnants, trace loose pyrite and disseminated pyrite
1,285.00 to 1,290.00 (5.00)	**SHALE** mainly dark gray as above, trace dark brown gray, minor pyrite
1,290.00 to 1,295.00 (5.00)	**SHALE** as above, dark gray to dark brown gray, micromicaceous, fissile, slightly bituminous in part, trace pyrite
1,295.00 to 1,300.00 (5.00)	**SHALE** dark gray to dark brown gray as above, increasing disseminated pyrite
1,300.00 to 1,305.00 (5.00)	**SHALE** dark gray, dark brown gray in part, micromicaceous, fissile, trace pyrite nodules and disseminated specks
1,305.00 to 1,310.00 (5.00)	**SHALE** as above, trace fossil shadows, trace pyrite
1,310.00 to 1,320.00 (10.00)	**SHALE** dark gray to dark brown gray as above, increasing pyrite, interbedded SHALE, medium gray, micromicaceous, fissile to blocky, calcareous, marly, harder than dark Shale
1,320.00 to 1,335.00 (15.00)	**SHALE** dark gray to very dark gray in part, micromicaceous, fissile, well indurated and blocky in part, bituminous, slightly calcareous in part, trace carbonaceous specks, trace pyrite
1,335.00 to 1,340.00 (5.00)	**SHALE** mainly dark gray as above, micromicaceous, fissile, slightly fossiliferous, slightly bituminous, pyritic with pyritized spicules in part
1,340.00 to 1,345.00 (5.00)	**SHALE** dark gray, micromicaceous, fissile, slightly bituminous, minor pyrite
1,345.00 to 1,350.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, calcareous and blocky in part, minor pyrite with trace pyritized spicules, trace very bituminous marly black Shale

1,350.00 to 1,355.00 (5.00)	**SHALE** dark gray to black, micromicaceous, fissile, slightly bituminous, trace pyrite
1,355.00 to 1,360.00 (5.00)	**SHALE** dark gray to dark brown gray to black, micromicaceous, fissile, moderately indurated in part, scattered pyrite, rare trace thin calcite healed microfractures
1,360.00 to 1,365.00 (5.00)	**SHALE** as above, dark gray to black, scattered pyrite, trace microfractures mainly calcite filled, trace anhydrite infill
1,365.00 to 1,370.00 (5.00)	**SHALE** dark gray to dark brown gray to black, micromicaceous, fissile, moderately soft to moderately indurated, slightly bituminous in part, minor disseminated pyrite
1,370.00 to 1,375.00 (5.00)	**SHALE** dark gray to black as above, trace medium gray Shale, scattered loose pyrite and disseminated pyrite
1,375.00 to 1,380.00 (5.00)	**SHALE** dark gray to black, micromicaceous, fissile, slightly bituminous, minor disseminated pyrite
1,380.00 to 1,385.00 (5.00)	**SHALE** as above, slightly bituminous, trace pyrite
1,385.00 to 1,390.00 (5.00)	**SHALE** dark gray to dark brown gray to black, micromicaceous, fissile, slightly bituminous, scattered loose pyrite, trace disseminated microcrystalline pyrite, trace dark gray Marlstone stringers
1,390.00 to 1,395.00 (5.00)	**SHALE** dark gray to dark brown gray to black, micromicaceous, fissile, slightly bituminous, trace pyrite, increasing Marlstone stringers, dark gray, tight
1,395.00 to 1,400.00 (5.00)	**SHALE** very dark gray to black, dark brown gray, fissile, moderately soft, bituminous, trace pyrite, rare trace clear coarse quartz fragments
1,400.00 to 1,405.00 (5.00)	**SHALE** very dark gray to dark brown gray to black, micromicaceous, fissile, slightly bituminous, manganese pyrite, trace marly stringers, rare trace very coarse hexagonal quartz crystal fragments
1,405.00 to 1,410.00 (5.00)	**SHALE** as above, minor pyrite, rare trace microfractures with anhydrite infill
1,410.00 to 1,415.00 (5.00)	**SHALE** very dark gray to dark brown gray to black, micromicaceous, fissile, slightly bituminous, minor loose pyrite

1,415.00 to 1,420.00 (5.00)	**SHALE** as above, slightly bituminous, moderately soft in part, trace pyrite, texture distorted by high rpm stratabit in part
1,420.00 to 1,425.00 (5.00)	**SHALE** dark gray to dark brown gray to black, micromicaceous, fissile, slightly bituminous, trace pyrite
1,425.00 to 1,430.00 (5.00)	**SHALE** as above, mainly dark brown gray, slightly bituminous
1,430.00 to 1,435.00 (5.00)	**SHALE** dark gray to black, micromicaceous, fissile, moderately soft in part, slightly bituminous, trace medium gray Shale, bit-trip, poor sample
1,435.00 to 1,440.00 (5.00)	**SHALE** very dark gray to black, dark brown gray, micromicaceous, fissile, slightly bituminous, scattered pyrite
1,440.00 to 1,445.00 (5.00)	**SHALE** very dark gray to black, micromicaceous, fissile, moderately indurated, trace pyrite, rare trace thin calcite filled microfractures
1,445.00 to 1,450.00 (5.00)	**SHALE** as above, slightly bituminous, trace Marlstone, medium gray, cryptocrystalline, calcareous, tight, no shows
1,450.00 to 1,455.00 (5.00)	**SHALE** very dark gray to black, micromicaceous, fissile, moderately to well indurated, trace pyrite, scattered fractures cemented with calcite, trace coarse loose white and clear calcite crystals
1,455.00 to 1,460.00 (5.00)	**SHALE** very dark gray to black, micromicaceous, fissile, slightly bituminous, moderately indurated, trace pyrite, decreasing microfractures
1,460.00 to 1,465.00 (5.00)	**SHALE** very dark gray to black as above, slightly bituminous, minor calcite healed microfractures, trace slickenside
1,465.00 to 1,470.00 (5.00)	**SHALE** very dark gray to black, micromicaceous, blocky, moderately to well indurated, bituminous, trace slickenside, trace pyrite
1,470.00 to 1,475.00 (5.00)	**SHALE** as above, bituminous, trace pyrite, trace slickenside, trace microfractures
1,475.00 to 1,480.00 (5.00)	**SHALE** very dark gray to black, dark brown gray in part, micromicaceous, fissile in part to blocky in part, moderately to well indurated, trace pyrite

1,480.00 to 1,485.00 (5.00)	**SHALE** as above, bituminous, moderately indurated, trace pyrite
1,485.00 to 1,490.00 (5.00)	**SHALE** dark gray to black, micromicaceous, fissile to blocky, siliceous, bituminous, moderately to well indurated, trace pyrite
1,490.00 to 1,495.00 (5.00)	**SHALE** very dark gray to black, micromicaceous, blocky, moderately to well indurated, bituminous, trace slickenside, trace pyrite
1,495.00 to 1,500.00 (5.00)	**SHALE** dark gray to black as above, trace slickenside, trace pyrite, minor Marlstone, dark gray, microcrystalline to very fine crystalline, dolomitic, tight, no shows
1,500.00 to 1,505.00 (5.00)	**SHALE** dark gray to black, micromicaceous, blocky, siliceous, bituminous, well indurated, trace pyrite, trace Marlstone stringers, dark gray, dolomitic, tight, trace siderite
1,505.00 to 1,510.00 (5.00)	**SHALE** as above, dark gray to black, dark brown gray in part, bituminous, siliceous, well indurated, trace slickenside, trace pyrite
1,510.00 to 1,515.00 (5.00)	**SHALE** as above, dark gray to dark brown gray to black, bituminous, siliceous and well indurated, minor pyrite, scattered Marlstone, dark gray to dark brown gray, microcrystalline to very fine crystalline, dolomitic, tight, no shows, trace siderite
1,515.00 to 1,518.00 (3.00)	**MARLSTONE** dark gray to dark brown gray, microcrystalline to very fine crystalline, dolomitic, tight, no shows, interbedded Shale, dark gray to dark brown gray to black, micromicaceous, slightly bituminous, siliceous, minor pyrite, trace siderite, trace calcite healed microfractures
1,518.00 to 1,525.00 (7.00)	**SHALE** dark gray to black, dark brown gray in part, micromicaceous, well indurated, siliceous, very sideritic in part, abundant Ironstone, dark gray brown, argillaceous, very hard
1,525.00 to 1,530.00 (5.00)	**SHALE** dark gray to dark brown gray to black, micromicaceous, sideritic to very sideritic grading to argillaceous Ironstone in part, hard, marly in part, slightly bituminous, scattered disseminated pyrite
1,530.00 to 1,535.00 (5.00)	**SHALE** dark gray to black as above, sideritic and hard, slightly bituminous, scattered argillaceous Ironstone, trace conchoidal fracture, trace pyrite
1,535.00 to 1,540.00 (5.00)	**SHALE** dark gray to dark brown gray to black, micromicaceous, blocky, siliceous, sideritic in part, well indurated, trace pyrite, decreasing Ironstone

1,540.00 to 1,545.00 (5.00)	**SHALE** dark gray to black, micromicaceous, fissile to blocky, very sideritic and hard in part, slightly softer and bituminous in part, trace pyrite
1,545.00 to 1,550.00 (5.00)	**SHALE** as above, sideritic and very hard in part, bituminous, trace pyrite
1,550.00 to 1,555.00 (5.00)	**SHALE** dark gray to black, micromicaceous, fissile, moderately to well indurated, sideritic in part with trace argillaceous Ironstone streaks, slightly bituminous, trace pyrite
1,555.00 to 1,560.00 (5.00)	**SHALE** dark gray to black, micromicaceous, fissile to blocky, slightly softer, sideritic streaks, bituminous, trace pyrite
1,560.00 to 1,565.00 (5.00)	**SHALE** dark gray to black as above, dark brown gray in part, bituminous, sideritic and very hard in part
1,565.00 to 1,570.00 (5.00)	**SHALE** dark gray to black as above, interbedded SHALE, medium gray, micromicaceous, fissile, softer than dark Shale, trace pyrite
1,570.00 to 1,575.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, minor pyrite, decreasing dark Shale as above
1,575.00 to 1,580.00 (5.00)	**SHALE** medium gray as above, micromicaceous, fissile, pearly lustre in part, minor disseminated pyrite
1,580.00 to 1,585.00 (5.00)	**SHALE** mainly medium gray, dark gray in part, micromicaceous, fissile, trace pyrite
1,585.00 to 1,590.00 (5.00)	**SHALE** medium gray as above, trace medium green gray, micromicaceous, fissile, trace fossil remnants, trace pyrite
1,590.00 to 1,595.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, marly streaks
1,595.00 to 1,600.00 (5.00)	**SHALE** as above, marly streaks, trace pyrite
1,600.00 to 1,605.00 (5.00)	**SHALE** mainly medium gray, trace dark gray, micromicaceous, fissile, marly streaks
1,605.00 to 1,610.00 (5.00)	**SHALE** medium gray as above, slightly calcareous to marly in part, trace pyrite, interbedded SHALE, dark gray (sloughing?), micromicaceous, fissile to blocky, moderately indurated, slightly bituminous, trace slickenside

1,610.00 to 1,615.00 (5.00)	**SHALE** mainly medium gray, trace dark gray, micromicaceous, fissile, moderately soft, slightly calcareous to marly in part, trace pyrite
1,615.00 to 1,620.00 (5.00)	**SHALE** medium gray as above, trace dark gray, grading to medium green gray in part, micromicaceous, fissile
1,620.00 to 1,625.00 (5.00)	**SHALE** medium gray as above, micromicaceous, fissile, trace pyrite, minor Shale, dark gray to black, micromicaceous, fissile to blocky, slightly bituminous
1,625.00 to 1,630.00 (5.00)	**SHALE** medium gray, medium green gray in rare in part, micromicaceous, fissile, moderately soft, trace slickenside, trace pyrite
1,630.00 to 1,635.00 (5.00)	**SHALE** as above, trace pyrite
1,635.00 to 1,640.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, slightly calcareous in part, minor pyrite
1,640.00 to 1,645.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, moderately soft in part, slightly calcareous to marly in part, trace pyrite
1,645.00 to 1,650.00 (5.00)	**SHALE** as above, mottled medium to dark gray in part, slightly calcareous in part, trace pyrite
1,650.00 to 1,655.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, very slightly calcareous in part, trace pyrite
1,655.00 to 1,660.00 (5.00)	**SHALE** medium gray, medium green gray in part, micromicaceous, fissile, marly stringers
1,660.00 to 1,665.00 (5.00)	**SHALE** medium gray as above, micromicaceous, fissile in part, slightly calcareous and moderately indurated in part
1,665.00 to 1,670.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly calcareous in part, trace sideritic streaks, trace pyrite
1,670.00 to 1,675.00 (5.00)	**SHALE** medium gray as above, interbedded SHALE, dark gray brown, sideritic to very sideritic, marly, well indurated
1,675.00 to 1,680.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, interbedded Ironstone, dark gray brown, argillaceous, marly, hard, minor Shale, dark gray to black, micromicaceous, black, moderately indurated, slightly bituminous

1,680.00 to 1,685.00 (5.00)	**SHALE** medium gray, medium green gray in part, micromicaceous, fissile, slightly calcareous in part, trace calcite healed microfractures, trace siderite
1,685.00 to 1,690.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, sideritic and well indurated in part, scattered Ironstone stringers
1,690.00 to 1,695.00 (5.00)	**shale** medium to dark gray, brown gray in part, micromicaceous, fissile to blocky in part, mainly soft with harder sideritic streaks
1,695.00 to 1,700.00 (5.00)	**SHALE** medium to dark gray as above, micromicaceous, decreasing sideritic stringers
1,700.00 to 1,705.00 (5.00)	**SHALE** medium gray, medium green gray in part, micromicaceous, fissile, slightly calcareous in part, moderately soft
1,705.00 to 1,710.00 (5.00)	**SHALE** medium gray to green gray as above, slightly calcareous and marly in part, trace pyrite
1,710.00 to 1,715.00 (5.00)	**SHALE** medium gray as above, micromicaceous, fissile, sideritic in part
1,715.00 to 1,720.00 (5.00)	**SHALE** medium gray to medium green gray, micromicaceous, fissile, moderately soft
1,720.00 to 1,725.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile to blocky in part, minor disseminated pyrite
1,725.00 to 1,730.00 (5.00)	**SHALE** as above, trace disseminated pyrite
1,730.00 to 1,735.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly bituminous in part, trace pyrite
1,735.00 to 1,740.00 (5.00)	**SHALE** medium gray as above with increasing dark gray Shale, micromicaceous, fissile, slightly sideritic in part, slightly bituminous in part, trace disseminated microcrystalline pyrite
1,740.00 to 1,745.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, blocky in part, slightly marly in part, trace siderite, trace pyrite
1,745.00 to 1,750.00 (5.00)	**SHALE** medium to dark gray to dark brown gray, micromicaceous, fissile to blocky, sideritic and hard in part, scattered Ironstone stringers, trace pyrite

1,750.00 to 1,755.00 (5.00)	**SHALE** as above, sideritic in part with decreasing Ironstone stringers
1,755.00 to 1,760.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly calcareous in part
1,760.00 to 1,765.00 (5.00)	**SHALE** as above, slightly calcareous in part, bituminous in part
1,765.00 to 1,770.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly calcareous in part, sideritic streak
1,770.00 to 1,775.00 (5.00)	**SHALE** dark gray to black, micromicaceous, fissile, bituminous, pyritic in part with trace pyritized spicules, trace siderite
1,775.00 to 1,780.00 (5.00)	**SHALE** dark gray to black as above, bituminous, trace pyrite
1,780.00 to 1,785.00 (5.00)	**SHALE** very dark gray to black, micromicaceous, fissile to blocky, bituminous, trace siderite, trace pyrite
1,785.00 to 1,790.00 (5.00)	**SHALE** very dark gray to black as above, micromicaceous, fissile to blocky, bituminous, sideritic in part with scattered loose siderite, trace pyrite
1,790.00 to 1,795.00 (5.00)	**SHALE** dark gray to dark brown gray to black, micromicaceous, fissile to blocky in part, slightly bituminous, slightly sideritic in part, trace pyrite
1,795.00 to 1,800.00 (5.00)	**SHALE** medium to dark gray, to black in part, micromicaceous, fissile, very sideritic and hard in part, slightly bituminous in part, minor Ironstone streaks, dark gray brown, argillaceous, hard
1,800.00 to 1,805.00 (5.00)	**SHALE** medium to dark gray, dark brown gray to black in part, micromicaceous, moderately indurated, bituminous with brown streak in part, sideritic and very hard in part with trace Ironstone stringers
1,805.00 to 1,810.00 (5.00)	**SHALE** as above, increasing medium gray, decreasing dark gray, bituminous in part, trace slickenside
1,810.00 to 1,815.00 (5.00)	**SHALE** medium to dark gray, dark brown gray in part, micromicaceous, fissile to blocky, slightly bituminous in part, sideritic in part
1,815.00 to 1,820.00 (5.00)	**SHALE** mainly dark gray as above, medium gray in part, micromicaceous, fissile, slightly bituminous, sideritic in part with trace Ironstone stringers, trace disseminated pyrite

1,820.00 to 1,825.00 (5.00)	**SHALE** dark gray to gray brown, micromicaceous, slightly sideritic, marly, trace pyrite
1,825.00 to 1,830.00 (5.00)	**SHALE** medium to dark gray, gray brown and sideritic in part, micromicaceous, moderately indurated, slightly silty in part
1,830.00 to 1,835.00 (5.00)	**SHALE** medium to dark gray as above, brown gray in part, marly in part
1,835.00 to 1,840.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile, slightly calcareous to marly, trace Limestone stringers, medium brown, cryptocrystalline, slightly argillaceous, tight, no shows
1,840.00 to 1,845.00 (5.00)	**SHALE** medium gray, medium green gray in part, trace dark gray, micromicaceous, fissile, slightly calcareous in part, moderately soft
1,845.00 to 1,850.00 (5.00)	**SHALE** medium gray as above, green gray in part, mottled dark gray in part, slightly calcareous to marly, trace Marlstone stringers, trace Shale, light to medium gray, very soft, trace Siltstone, light to medium gray, very siliceous and hard in part, slightly calcareous, argillaceous in part, tight, no shows
1,850.00 to 1,855.00 (5.00)	**SHALE** medium gray to medium green gray, trace dark gray, micromicaceous, fissile, slightly calcareous in part, silty in part, minor Siltstone laminations, medium gray, mainly quartzose, siliceous, well indurated, slightly calcareous, slightly argillaceous in part, micromicaceous, tight, no shows
1,855.00 to 1,860.00 (5.00)	**SHALE** as above, mainly medium gray to medium green gray, silty in part with scattered Siltstone streaks
1,860.00 to 1,865.00 (5.00)	**SHALE** medium gray as above, decreasing Siltstone streaks, trace Shale, light to medium gray, very soft, slightly bentonitic
1,865.00 to 1,870.00 (5.00)	**SHALE** medium gray to medium green gray, micromicaceous, fissile, moderately soft, silty in part, slightly calcareous in part, trace pyrite, trace Siltstone laminations
1,870.00 to 1,875.00 (5.00)	**SHALE** medium to dark gray to green gray, micromicaceous, fissile, moderately soft, light gray and very soft in part, sideritic and moderately indurated in part, minor pyrite, trace siderite
1,875.00 to 1,880.00 (5.00)	**SHALE** as above, mainly medium gray, micromicaceous, slightly silty with trace Siltstone laminations, light to medium gray, quartzose, siliceous and hard, slightly calcareous in part, tight, no shows

1,880.00 to 1,885.00 (5.00)	**SHALE** as above, medium to dark gray in part, sideritic with trace Ironstone stringers, trace Limestone, medium brown, cryptocrystalline, argillaceous, tight, no shows
1,885.00 to 1,890.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, silty to very silty in part, marly in part, trace Siltstone stringers as above
1,890.00 to 1,895.00 (5.00)	**SHALE** medium gray as above, slightly silty with trace Siltstone laminations as above
1,895.00 to 1,900.00 (5.00)	**SHALE** medium gray to medium brown gray, micromicaceous, fissile to blocky, sideritic and well indurated in part, slightly silty in part, marly in part, trace Siltstone, medium gray, quartzose, very siliceous, slightly calcareous, slightly argillaceous, tight, no shows
1,900.00 to 1,905.00 (5.00)	**SHALE** as above, slightly sideritic in part, marly in part, silty, scattered mica (lost circulation material)
1,905.00 to 1,910.00 (5.00)	**SHALE** medium gray to medium brown gray, micromicaceous, fissile to blocky, mainly moderately soft, sideritic and hard in part, slightly silty in part
1,910.00 to 1,915.00 (5.00)	**SHALE** medium to dark gray, brown gray in part, micromicaceous, fissile to blocky, moderately indurated, slightly sideritic in part, silty in part, trace pyrite
1,915.00 to 1,920.00 (5.00)	**SHALE** medium gray to brown gray, micromicaceous, fissile to blocky, sideritic and well indurated, scattered Ironstone stringers
1,920.00 to 1,925.00 (5.00)	**SHALE** medium brown gray as above, sideritic, micromicaceous, moderately indurated, trace Siltstone stringers
1,925.00 to 1,930.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile to blocky in part, sideritic in part, trace slickenside
1,930.00 to 1,935.00 (5.00)	**SHALE** as above, sideritic and moderately indurated in part, trace slickenside
1,935.00 to 1,940.00 (5.00)	**SHALE** medium gray to green gray in part, micromicaceous, fissile to blocky in part, slightly sideritic in part, trace slickenside
1,940.00 to 1,945.00 (5.00)	**SHALE** as above, moderately indurated, trace slickenside

1,945.00 to 1,950.00 (5.00)	**SHALE** medium gray as above, silty, minor Siltstone streaks
1,950.00 to 1,955.00 (5.00)	**SHALE** medium gray to medium green gray, micromicaceous, calcareous to marly in part, silty in part, slightly fossiliferous with trace shell fragments, trace Siltstone laminations
1,955.00 to 1,960.00 (5.00)	**SHALE** medium gray as above, slightly sideritic in part, scattered SHALE, dark gray to dark brown gray to black, micromicaceous, fissile, slightly calcareous, silty, bituminous in part
1,960.00 to 1,965.00 (5.00)	**SHALE** medium gray to green gray as above, micromicaceous, trace slickenside, minor dark gray to black Shale streak as above, minor Siltstone laminations, medium gray, slightly calcareous, siliceous, hard, tight, no shows
1,965.00 to 1,970.00 (5.00)	**SHALE** medium to dark gray, green gray in part, micromicaceous, fissile in part, blocky in part, silty to very silty in part, trace slickenside, trace microfractures, trace Siltstone laminations
1,970.00 to 1,975.00 (5.00)	**SHALE** medium gray as above, silty in part, calcareous in part, minor Siltstone laminations, medium to dark gray, quartzose, siliceous, well indurated, calcareous in part, slightly argillaceous, micromicaceous, tight, no shows
1,975.00 to 1,980.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile to blocky, hardness varies from moderately soft to moderately indurated, silty to very silty in part, slightly calcareous to dolomitic in part, trace Siltstone, medium to dark gray, quartzose, argillaceous to very argillaceous in part, siliceous, slightly dolomitic, tight, no shows
1,980.00 to 1,985.00 (5.00)	**SHALE** medium to dark gray as above, slightly silty with scattered Siltstone laminations, slightly dolomitic, trace pyrite, trace light to medium gray Shale, very soft
1,985.00 to 1,990.00 (5.00)	**SHALE** mainly medium gray as above, silty to very silty in part, slightly dolomitic, moderately indurated, trace Siltstone laminations
1,990.00 to 1,995.00 (5.00)	**SHALE** medium gray to medium green gray in part, micromicaceous, mainly fissile, blocky in part, slightly silty, trace light gray Shale, very soft
1,995.00 to 2,000.00 (5.00)	**SHALE** medium gray as above, fissile, much of the medium gray Shale is water sensitive and can be washed away when cleaning sample with water
2,000.00 to 2,005.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, slightly dolomitic in part, silty, trace pyrite

2,005.00 to 2,010.00 (5.00)	**SHALE** medium gray, to dark gray in part, micromicaceous, fissile to blocky in part, calcareous to dolomitic, silty in part, trace pyrite, trace Siltstone laminations
2,010.00 to 2,015.00 (5.00)	**SHALE** medium to dark gray as above, calcareous to dolomitic, slightly silty in part, trace fractures with coarse white calcite crystalline cement
2,015.00 to 2,020.00 (5.00)	**SHALE** as above, dolomitic in part, trace light gray Shale, very soft, bentonitic
2,020.00 to 2,025.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile in part, blocky and silty in part, rare trace calcite healed microfractures
2,025.00 to 2,030.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, bentonitic and soft in part, moderately indurated and silty in part, trace microfractures
2,030.00 to 2,035.00 (5.00)	**SHALE** as above, mainly medium gray as above, soft to moderately indurated, silty in part, micromicaceous, trace slickenside
2,035.00 to 2,040.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, slightly silty in part
2,040.00 to 2,045.00 (5.00)	**SHALE** medium gray as above, trace calcite healed microfractures, trace slickenside, trace pyrite
2,045.00 to 2,050.00 (5.00)	**SHALE** medium gray to medium green gray, micromicaceous, fissile, trace pyrite, rare trace clear hexagonal quartz crystals
2,050.00 to 2,055.00 (5.00)	**SHALE** medium gray to green gray as above, trace fossil remnants, minor calcite healed microfractures
2,055.00 to 2,060.00 (5.00)	**SHALE** medium gray to green gray as above, increasing microfractures, calcite healed in part, trace dolomitic cement, trace clear loose quartz crystals
2,060.00 to 2,065.00 (5.00)	**SHALE** medium to dark gray, to green gray in part, micromicaceous, fissile, trace microfractures, trace slickenside, trace clear hexagonal quartz crystals
2,065.00 to 2,070.00 (5.00)	**SHALE** as above, mainly medium gray, micromicaceous, slightly silty in part, trace pyrite
2,070.00 to 2,075.00 (5.00)	**SHALE** medium gray, medium green gray in part, micromicaceous, fissile, slightly silty, minor microfractures, trace Siltstone laminations

2,075.00 to 2,080.00 (5.00)	**SHALE** medium gray as above, micromicaceous, moderately soft in part, silty and hard in part, trace microfractures, trace Siltstone laminations, trace pyrite
2,080.00 to 2,085.00 (5.00)	**SHALE** medium gray as above, hardness ranges from moderately soft to moderately indurated, silty in part, trace Siltstone laminations, trace slickenside
2,085.00 to 2,090.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, moderately soft in part, silty and moderately indurated in part
2,090.00 to 2,095.00 (5.00)	**SHALE** as above, trace Shale, light to medium gray, very soft
2,095.00 to 2,100.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, slightly silty in part, trace pyrite, trace light gray soft Shale
2,100.00 to 2,105.00 (5.00)	**SHALE** medium gray as above, micromicaceous, fissile, silty in part, calcareous to marly in part, trace microfractures, trace light gray soft Shale as above
2,105.00 to 2,110.00 (5.00)	**SHALE** medium gray, medium to dark green gray in part, micromicaceous, fissile, slightly silty in part, trace light gray soft Shale
2,110.00 to 2,115.00 (5.00)	**SHALE** medium gray to medium green gray in part, micromicaceous, fissile, trace disseminated pyrite, trace light gray soft Shale
2,115.00 to 2,120.00 (5.00)	**SHALE** medium gray as above, silty in part with trace Siltstone laminations
2,120.00 to 2,125.00 (5.00)	**SHALE** as above, micromicaceous, fissile, trace pyrite
2,125.00 to 2,130.00 (5.00)	**SHALE** mainly medium gray, micromicaceous, fissile, slightly silty in part, moderately soft, trace pyrite, trace light gray soft Shale
2,130.00 to 2,135.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile to blocky, moderately indurated, slightly dolomitic to marly in part, trace disseminated microcrystalline pyrite
2,135.00 to 2,140.00 (5.00)	**SHALE** mainly medium gray as above, micromicaceous, blocky
2,140.00 to 2,145.00 (5.00)	**SHALE** medium gray as above, micromicaceous, fissile to blocky, trace microfractures

2,145.00 to 2,150.00 (5.00)	**SHALE** as above, minor calcite healed microfractures
2,150.00 to 2,155.00 (5.00)	**SHALE** medium gray, minor dark gray, micromicaceous, fissile to blocky in part, moderately soft to moderately indurated in part, silty in part with trace hard Siltstone laminations
2,155.00 to 2,160.00 (5.00)	**SHALE** medium to dark gray as above, slightly silty in part, trace light gray soft Shale
2,160.00 to 2,165.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile to blocky in part, trace open microfractures (drillbit action?), increasing light gray soft SHALE
2,165.00 to 2,170.00 (5.00)	**SHALE** medium to dark gray as above, micromicaceous, fissile, slightly silty in part, trace pyrite, trace Siltstone laminations
2,170.00 to 2,175.00 (5.00)	**SHALE** medium to dark gray, micromicaceous, fissile to blocky in part, slightly silty, trace pyrite, trace Siltstone laminations
2,175.00 to 2,180.00 (5.00)	**SHALE** medium to dark gray as above, slightly silty in part, trace microfractures
2,180.00 to 2,185.00 (5.00)	**SHALE** medium gray, micromicaceous, fissile, moderately soft, slightly silty in part, trace pyrite, trace Siltstone laminations, increasing SHALE, light gray, fissile, very soft, easily washed away while washing with water
2,185.00 to 2,190.00 (5.00)	**SHALE** medium gray with increasing dark gray, micromicaceous, fissile, moderately indurated
2,190.00 to 2,195.00 (5.00)	**SHALE** as above, mainly dark gray to dark green gray, micromicaceous, fissile
2,195.00 to 2,200.00 (5.00)	**SHALE** dark gray to dark green gray, micromicaceous, fissile, trace microfractures cemented with dolomite in part, trace drusy Dolomite crystals lining open open fractures, trace fracture porosity
2,200.00 to 2,205.00 (5.00)	**SHALE** dark gray to dark green gray as above, slightly sideritic in part
2,205.00 to 2,210.00 (5.00)	**SHALE** dark gray to very dark gray, micromicaceous, fissile to blocky in part, dolomitic and marly
2,210.00 to 2,215.00 (5.00)	**SHALE** dark gray to very dark gray, micromicaceous, fissile to blocky in part, dolomitic, trace pyrite, trace Marlstone, very dark gray to black, dolomitic, hard, tight

2,215.00 to 2,220.00 (5.00)	**SHALE** dark gray to very dark gray, dark green gray in part, micromicaceous, fissile, slightly dolomitic in part, marly, trace slickenside, abundant disseminated microcrystalline pyrite
2,220.00 to 2,225.00 (5.00)	**SHALE** dark gray to black, micromicaceous, fissile, slightly bituminous, trace pyrite
2,225.00 to 2,230.00 (5.00)	**SHALE** dark gray as above, micromicaceous, fissile, very pyritic with abundant disseminated microcrystalline pyrite
2,230.00 to 2,235.00 (5.00)	**SHALE** dark gray to very dark gray as above, micromicaceous, fissile, pyritic in part, minor Marlstone, dark brown gray, microcrystalline, dolomitic, tight, no shows
2,235.00 to 2,240.00 (5.00)	**SHALE** dark gray to dark brown gray, micromicaceous, fissile, slightly bituminous, pyritic to very pyritic in part
2,240.00 to 2,245.00 (5.00)	**SHALE** dark gray to black, micromicaceous, fissile to blocky in part, slightly bituminous, siliceous and very hard in part, pyritic to very pyritic with scattered disseminated microcrystalline pyrite in part
2,245.00 to 2,250.00 (5.00)	**SHALE** dark gray to black, micromicaceous, blocky in part, slightly bituminous, siliceous and very hard in part, trace conchoidal fracture, pyritic with scattered disseminated microcrystalline pyrite in part, trace black argillaceous Chert
2,250.00 to 2,255.00 (5.00)	**SHALE** dark gray to black as above, dark brown gray in part, very siliceous grading to argillaceous Chert in part, trace conchoidal fracture, scattered pyrite, trace dolomite cemented microfractures, rare trace open microfractures with quartz crystals lining fracture plane
2,255.00 to 2,260.00 (5.00)	**SHALE** dark gray to black as above, very siliceous grading to black Chert in part, scattered microfractures cemented with dolomite, rare trace open microfractures with drusy quartz crystal lining, trace fracture porosity, trace SHALE, dark brown gray to black, moderately soft, very bituminous
2,260.00 to 2,265.00 (5.00)	**SHALE** very dark gray to black, blocky, very siliceous grading to black argillaceous Chert, very hard, scattered microfractures with quartz crystal lining, trace poor fracture porosity, trace pyrite veins and pyritic inclusions, trace slickenside
2,265.00 to 2,270.00 (5.00)	**SHALE** very dark gray to black, blocky, very siliceous and very hard, scattered fractures with quartz crystal lining, trace quartz crystal fragments to 5mm, trace fracture porosity, trace pyrite veins and pyritic inclusions, minor Chert, black

2,270.00 to 2,275.00 (5.00)	**SHALE** very dark gray to black as above, very siliceous, cherty and hard, minor fractures with quartz lining, scattered loose quartz crystal fragments, trace poor fracture porosity, no shows, minor Dolomite, dark gray brown, microcrystalline, very argillaceous grading to Marlstone, tight, no shows
2,275.00 to 2,280.00 (5.00)	**SHALE** very dark gray to black, very siliceous, cherty and hard, trace slickenside, scattered disseminated pyrite and pyritic inclusions, trace microfractures, trace dark gray brown Dolomite as above
2,280.00 to 2,285.00 (5.00)	**SHALE** very dark gray to black as above, very siliceous and hard, trace conchoidal fracture, minor microfractures cement tight with quartz in part, open with drusy quartz crystals in part, trace pyrite
2,285.00 to 2,290.00 (5.00)	**SHALE** very dark gray to black as above, very siliceous grading to Chert, hard, trace open fractures with very coarse hexagonal quartz crystals and crystal fragments to 5mm, trace fracture porosity
2,290.00 to 2,295.00 (5.00)	**SHALE** dark gray to black, siliceous in part, moderately indurated to hard, trace pyrite, trace Shale, dark brown gray, bituminous, moderately soft
2,295.00 to 2,300.00 (5.00)	**SHALE** very dark gray to black, very siliceous and hard, cherty, trace conchoidal fracture, minor pyrite, trace quartz healed microfractures
2,300.00 to 2,305.00 (5.00)	**SHALE** very dark gray to black as above, siliceous in part, moderately indurated to hard, bituminous, minor disseminated microcrystalline pyrite, trace Shale, medium to dark gray, moderately soft, slightly calcareous
2,305.00 to 2,310.00 (5.00)	**SHALE** dark gray to black, siliceous and very hard in part, calcareous in part with trace white calcareous specks and laminations, trace fractures with sparry calcite calcite crystals
2,310.00 to 2,315.00 (5.00)	**SHALE** dark gray to black, fissile in part, blocky in part, very siliceous and hard, slightly calcareous in part, minor microfractures healed with both calcite and quartz crystals
2,315.00 to 2,320.00 (5.00)	**SHALE** dark gray to black as above, scattered fractures with very coarse calcite crystals, trace fractures porosity
2,320.00 to 2,325.00 (5.00)	**SHALE** very dark gray to black, siliceous, hard, trace conchoidal fracture, slightly calcareous in part, trace calcite healed microfractures

2,325.00 to 2,330.00 (5.00)	**SHALE** very dark gray to black in part, siliceous, cherty and very hard, scattered Shale, medium to dark gray, calcareous, moderately soft
2,330.00 to 2,335.00 (5.00)	**SHALE** very dark gray to black, siliceous in part, moderately indurated to very hard, trace conchoidal fracture, bituminous, slightly calcareous in part, trace pyrite, trace slickenside
2,335.00 to 2,340.00 (5.00)	**SHALE** dark gray to black as above, soft with scattered calcareous white specks in part, trace slickenside
2,340.00 to 2,345.00 (5.00)	**SHALE** very dark gray to black, siliceous, very hard, trace conchoidal fracture, interbedded SHALE, dark brown gray to black, moderately soft, very calcareous with trace calcite white specks, bituminous, trace calcite veins
2,345.00 to 2,350.00 (5.00)	**SHALE** dark gray to dark brown gray, micromicaceous, fissile, slightly calcareous with trace white calcareous specks and veins, moderately soft, trace pyrite, decreasing SHALE, very dark gray to black, siliceous and very hard
2,350.00 to 2,355.00 (5.00)	**SHALE** dark gray to very dark gray, brown gray as above, moderately soft, calcareous, minor black siliceous Shale as above
2,355.00 to 2,360.00 (5.00)	**SHALE** dark gray to black, micromicaceous, fissile, slightly calcareous to very calcareous in part, moderately soft, interbedded SHALE, black, siliceous and very hard, trace microfractures with quartz and pyrite veins
2,360.00 to 2,365.00 (5.00)	**SHALE** dark gray to black as above, calcareous to very calcareous with trace calcareous white specks, bituminous, interbedded siliceous Shale as above, trace pyrite
2,365.00 to 2,370.00 (5.00)	**SHALE** dark gray to black, calcareous to very calcareous, moderately soft, trace pyrite
2,370.00 to 2,375.00 (5.00)	**SHALE** dark gray to black as above, calcareous, scattered calcite healed fractures
2,375.00 to 2,380.00 (5.00)	**SHALE** dark gray to black, very hard, siliceous, trace conchoidal fracture, slightly calcareous in part, scattered microfractures with calcite veins to 5mm, trace pyrite
2,380.00 to 2,385.00 (5.00)	**SHALE** dark gray to black as above, siliceous, hard, conchoidal fracture, calcareous to marly in part, scattered microfractures with calcite cement, trace pyrite
2,385.00 to 2,390.00 (5.00)	**SHALE** dark gray to black, siliceous, hard, slightly calcareous in part, bituminous, trace Shale, dark gray, moderately soft, calcareous

2,390.00 to 2,395.00 (5.00)	**SHALE** dark gray to black, calcareous with trace calcareous white specks in part moderately soft to moderately indurated, siliceous and hard in part, bituminous, trace pyrite
2,395.00 to 2,400.00 (5.00)	**SHALE** as above, calcareous, bituminous, siliceous and hard in part, minor microfractures with calcareous cement, trace pyrite
2,400.00 to 2,405.00 (5.00)	**SHALE** dark gray to black, calcareous to very calcareous, moderately soft, siliceous and hard in part, bituminous, trace white calcite veins and specks
2,405.00 to 2,410.00 (5.00)	**SHALE** very dark gray to black, very calcareous, bituminous, moderately soft, trace disseminated microcrystalline pyrite
2,410.00 to 2,415.00 (5.00)	**SHALE** dark gray to black as above, calcareous, bituminous, moderately soft
2,415.00 to 2,420.00 (5.00)	**SHALE** dark gray to black, calcareous, marly, slightly siliceous in part, bituminous, mainly moderately soft, trace calcareous white specks and laminations
2,420.00 to 2,425.00 (5.00)	**SHALE** dark gray to black as above, bituminous, slightly calcareous with trace calcareous white specks, trace pyrite
2,425.00 to 2,430.00 (5.00)	**SHALE** medium to dark gray, calcareous to very calcareous, bituminous, soft, trace pyrite
2,430.00 to 2,435.00 (5.00)	**SHALE** dark gray to black, calcareous to very calcareous as above, bituminous, moderately soft
2,435.00 to 2,440.00 (5.00)	**SHALE** dark gray to black as above, calcareous with scattered white calcareous veins, specks and inclusions
2,440.00 to 2,445.00 (5.00)	**SHALE** dark gray to black, calcareous to very calcareous with trace calcareous white specks, slightly siliceous, moderately indurated, bituminous, trace pyrite
2,445.00 to 2,450.00 (5.00)	**SHALE** as above, calcareous, siliceous, moderately indurated, scattered Shale, dark gray to black, very calcareous, moderately soft
2,450.00 to 2,455.00 (5.00)	**SHALE** dark gray to black, slightly calcareous to very calcareous, trace calcite veins and white specks, slightly bituminous, trace pyrite

2,455.00 to 2,460.00 (5.00)	**SHALE** as above, calcareous, slightly siliceous in part, trace conchoidal fracture, bituminous, trace calcareous white specks, trace calcite filled microfractures
2,460.00 to 2,465.00 (5.00)	**SHALE** dark gray to black, siliceous, well indurated, slightly calcareous in part, slightly bituminous, minor calcareous chalky white specks and veins
2,465.00 to 2,470.00 (5.00)	**SHALE** dark gray to black as above, siliceous, calcareous grading to Marlstone in part, minor microfractures at acute angles, calcite filled
2,470.00 to 2,475.00 (5.00)	**SHALE** dark gray to black, dark brown gray in part, slightly calcareous to very calcareous with trace calcareous white specks and calcite filled microfractures, bituminous, siliceous, trace conchoidal fracture
2,475.00 to 2,480.00 (5.00)	**SHALE** mainly dark gray to black, trace medium gray, very calcareous, marly, soft, bituminous
2,480.00 to 2,484.00 (4.00)	**SHALE** medium to dark gray to black, very calcareous with scattered chalky calcareous white specks and inclusions, bituminous, moderately soft
2,484.00 to 2,490.00 (6.00)	**DOLOMITE** light to medium gray, to medium brown gray, microcrystalline to medium crystalline, to coarse crystalline in part, poor intercrystalline and pin point porosity, trace pyrobitumen, trace clear coarse quartz crystals
2,489.00 to 2,495.00 (6.00)	**DOLOMITE** as above, light to medium gray, fine to coarse crystalline, indicated poor to fair intercrystalline and pin point porosity (drusy coarse Dolomite rhombs and coarse hexagonal quartz crystals), trace pyrobitumen
2,494.00 to 2,500.00 (6.00)	**DOLOMITE** as above, with light gray coarse Dolomite crystals, mainly tight, trace pyrobitumen, trace medium to dark gray Dolomite, very fine to fine crystalline, tight, no shows, poor sample
2,500.00 to 2,503.00 (3.00)	**DOLOMITE** light to medium gray, to medium brown gray in part, fine to medium crystalline with scattered coarse to very coarse white Dolomite crystals, trace poor intercrystalline porosity, no fluorescence, scattered pyrobitumen, trace clear quartz crystals
2,503.00 to 2,510.00 (7.00)	**DOLOMITE** off white to very light gray to medium gray brown, very fine to medium crystalline to coarse crystalline in part, trace poor intercrystalline porosity mainly plugged with pyrobitumen, no fluorescence, trace stylolites, minor white Dolomite rhombs, trace microfractures with white Dolomite veins

2,510.00 to 2,515.00 (5.00)	**DOLOMITE** off white to light gray, medium gray brown in part, mainly fine to coarse crystalline, very fine to fine medium brown Dolomite in part, trace coarse to very coarse Dolomite crystals, trace poor intercrystalline and fracture porosity mainly plugged with scattered pyrobitumen, no fluorescence, abundant Dolomite rhombs, trace twinned Dolomite crystals, rare trace quartz crystals (hexagonal in part), scattered white Dolomite veins in medium gray brown Dolomite host rock
2,515.00 to 2,520.00 (5.00)	**DOLOMITE** as above, off white to light gray, medium gray brown in part, very fine to coarse crystalline, poor intercrystalline porosity, trace fracture porosity, scattered pyrobitumen, scattered very coarse Dolomite rhombs, sample 60% coarse white Dolomite, 40% very fine to fine crystalline brown Dolomite
2,520.00 to 2,525.00 (5.00)	**DOLOMITE** off white to very light gray, medium gray brown in part, trace dark gray brown, very fine to coarse crystalline, trace poor intercrystalline and fracture porosity with pyrobitumen in part, streak fair intercrystalline porosity plugged with pyrobitumen, no fluorescence, trace clear quartz crystals
2,525.00 to 2,530.00 (5.00)	**DOLOMITE** off white to medium gray brown, very fine to coarse crystalline, poor intercrystalline, vug and fracture porosity, intercrystalline porosity mainly plugged with pyrobitumen, trace very coarse clean drusy Dolomite crystal clusters (vugs?), no fluorescence, trace clear quartz crystals
2,530.00 to 2,535.00 (5.00)	**DOLOMITE** light to dark gray, very fine to medium crystalline, to coarse crystalline in part, poor intercrystalline, and fracture porosity, intercrystalline porosity plugged with pyrobitumen, no fluorescence, scattered drusy Dolomite rhombs, trace clear quartz crystals
2,535.00 to 2,540.00 (5.00)	**DOLOMITE** as above, mainly tight with trace poor intercrystalline porosity, decreasing pyrobitumen, scattered drusy Dolomite crystals, sample 50% coarse white Dolomite crystals, 50% medium to dark brown gray very fine to fine crystalline tight Dolomite
2,540.00 to 2,545.00 (5.00)	**DOLOMITE** light to medium gray to brown gray, fine to medium crystalline, to coarse crystalline in part, poor intercrystalline porosity, minor pyrobitumen, no fluorescence, trace pyrite, scattered very coarse drusy Dolomite rhombs
2,545.00 to 2,550.00 (5.00)	**DOLOMITE** light to medium gray to gray brown, fine to medium crystalline, to coarse crystalline in part, streaks poor to fair intercrystalline porosity, pyrobitumen plugging in part, scattered drusy Dolomite rhombs, trace quartz crystals
2,550.00 to 2,555.00 (5.00)	**DOLOMITE** as above, mainly medium brown to medium gray brown, very fine to fine crystalline, with minor coarse to very coarse white Dolomite crystals, mainly tight with trace poor intercrystalline porosity, minor pyrobitumen

2,555.00 to 2,560.00 (5.00)	**DOLOMITE** medium to dark gray brown, very fine to fine crystalline, bituminous with minor pyrobitumen residue, mainly tight, no fluorescence, streak Dolomite, off white to light gray, medium to very coarse crystalline drusy Dolomite rhombs and rosettes, fair intercrystalline and vug porosity, no fluorescence, no pyrobitumen on coarse crystals, scattered coarse light gray calcite crystals
2,560.00 to 2,565.00 (5.00)	**DOLOMITE** off white to medium to dark gray, very fine to coarse crystalline, to very coarse crystalline in part, streaks poor intercrystalline and vug porosity, no fluorescence, very coarse drusy Dolomite rhombs and rosettes have no pyrobitumen (vugs?), fine to coarse intercrystalline porosity has pyrobitumen plugging
2,565.00 to 2,570.00 (5.00)	**DOLOMITE** as above, fine to medium crystalline gray to brown gray Dolomite with coarse to very coarse crystalline white Dolomite rhombs, trace fossil shadows (circular, Amphipora? Coral? Crinoid?) indicated poor to fair vug &/or fracture porosity, trace intercrystalline porosity, no fluorescence, trace pyrobitumen plugging intercrystalline porosity
2,570.00 to 2,575.00 (5.00)	**DOLOMITE** light to medium gray to brown gray, very fine to medium crystalline, to coarse crystalline in part, poor intercrystalline porosity mainly pyrobitumen plugged, decreasing coarse white Dolomite crystals, trace stylolites, trace pyrite
2,575.00 to 2,580.00 (5.00)	**DOLOMITE** mainly medium gray to brown gray, fine to medium crystalline with scattered coarse to very coarse off white to light gray Dolomite crystals, trace circular fossil shadows (Amphipora?) (reefal?), trace poor intercrystalline porosity (mainly plugged with pyrobitumen), poor vug porosity, no fluorescence
2,580.00 to 2,585.00 (5.00)	**DOLOMITE** as above, medium to dark gray to brown gray host rock with white Dolomite crystals, very fine to medium crystalline with scattered white to light gray coarse to very coarse Dolomite crystals, decreasing porosity, decreasing coarse white Dolomite 25%, dark gray host rock 75%
2,585.00 to 2,590.00 (5.00)	**DOLOMITE** dark gray, very fine to fine crystalline, fossiliferous, trace Amphipora, trace poor intercrystalline and vug porosity, no fluorescence, trace pyrobitumen, scattered very coarse drusy Dolomite rhombs to 3mm, trace calcite crystals, trace clear quartz crystals (hexagonal in part)
2,590.00 to 2,595.00 (5.00)	**DOLOMITE** dark gray to dark brown gray as above, very fine to medium crystalline, fossiliferous, trace Amphipora, trace Brachiopods, Stromatoporoid remnants? mainly tight with trace very poor intercrystalline and vug porosity, no fluorescence, decreasing pyrobitumen to rare trace, scattered very coarse white Dolomite crystals, trace quartz crystals

2,595.00 to 2,600.00 (5.00)	**DOLOMITE** dark gray to dark brown gray host rock as above, increasing white Dolomite crystals, fossiliferous, trace poor intercrystalline and vug porosity, minor pyrobitumen, scattered coarse to very coarse Dolomite crystals, trace rhombs, trace quartz crystals
2,600.00 to 2,605.00 (5.00)	**DOLOMITE** medium to dark gray as above, mainly tight, streak of DOLOMITE, off white to very light gray, fine to very coarse crystalline, indicated fair porosity, mainly clean coarse Dolomite crystals, minor rhombs, trace quartz crystals (hexagonal in part)
2,605.00 to 2,610.00 (5.00)	**DOLOMITE** dark gray, dark brown gray in part, very fine to medium crystalline, fossiliferous, mainly tight with trace poor vug and fracture? porosity, no pyrobitumen, scattered coarse to very coarse Dolomite crystals, trace very coarse calcite crystals, trace white Dolomite veins in dark gray host rock, trace stylolites
2,610.00 to 2,615.00 (5.00)	**DOLOMITE** dark gray as above, fossiliferous, tight, scattered Dolomite, light to medium gray, fine to medium crystalline, fossiliferous, trace poor intercrystalline and vug porosity, trace pyrobitumen in part, scattered drusy Dolomite crystals and rhombs to 5mm, trace hexagonal quartz crystals, rare trace pyrite
2,615.00 to 2,620.00 (5.00)	**DOLOMITE** light to dark gray to brown gray, very fine to coarse crystalline, fossiliferous, mainly tight due to pyrobitumen plugging intercrystalline porosity, poor vug porosity, scattered coarse to very coarse drusy Dolomite crystals, trace quartz crystals
2,620.00 to 2,625.00 (5.00)	**DOLOMITE** mainly dark gray, medium to dark brown gray in part, very fine to medium crystalline, fossiliferous, mainly tight, no shows, scattered coarse white Dolomite crystals, trace clear quartz crystals
2,625.00 to 2,630.00 (5.00)	**DOLOMITE** medium to dark gray host rock as above, slightly siliceous with trace cherty residue, increasing off white to light gray coarse to very coarse Dolomite crystals, trace poor vug porosity, no shows, no pyrobitumen, trace Dolomite rhombs and rosettes, trace clear quartz crystals, 50% dark gray Dolomite, 50% coarse white crystals
2,630.00 to 2,635.00 (5.00)	**DOLOMITE** dark gray, medium to dark brown gray in part, very fine to medium crystalline, trace fossil shadows, tight, no shows, 80% dark gray Dolomite, 20% coarse white crystals, trace medium to dark gray Chert
2,635.00 to 2,640.00 (5.00)	**LIMESTONE** medium gray brown, cryptocrystalline, clean, slightly fossiliferous, tight, no shows, scattered stylolites, trace disseminated pyrite
2,640.00 to 2,645.00 (5.00)	**DOLOMITE** dark gray, very fine to fine crystalline, slightly fossiliferous, scattered very fine bituminous residue, tight, no shows, streak DOLOMITE, light gray, fine to coarse crystalline, poor intercrystalline and vug porosity, pyrobitumen plugging

intercrystalline porosity, no fluorescence

2,645.00 to 2,650.00 (5.00)	**DOLOMITE** light gray to light to medium brown gray, fine to coarse crystalline, trace fossil remnants, streaks poor to fair intercrystalline and trace vug porosity, no fluorescence, scattered pyrobitumen plugging intercrystalline porosity
2,650.00 to 2,655.00 (5.00)	**DOLOMITE** light to medium gray host rock, very fine to fine crystalline, fossiliferous (reefal?), abundant white coarse to very coarse Dolomite crystals, streaks poor intercrystalline porosity, trace vug porosity, no fluorescence, rare trace pyrobitumen, mainly clean, trace very coarse Dolomite rhombs
2,655.00 to 2,660.00 (5.00)	**DOLOMITE** light to dark gray to brown gray in part, fine to coarse crystalline, trace fossil remnants, streaks poor intercrystalline porosity, trace vug porosity, no fluorescence, minor pyrobitumen, scattered white coarse to very coarse Dolomite crystals, rhombic in part, trace white Dolomite veins, trace medium gray Chert
2,660.00 to 2,665.00 (5.00)	**DOLOMITE** medium to dark gray as above, fine to medium crystalline, abundant off white to light gray very to very coarse Dolomite crystals, trace fossil shadows, fair vug porosity, no fluorescence, trace pyrobitumen, trace clear quartz crystals
2,665.00 to 2,670.00 (5.00)	**DOLOMITE** as above, indicated fair vug porosity, no fluorescence, trace intercrystalline porosity with some pyrobitumen plugging, trace Dolomite, medium brown, microcrystalline, clean, tight, no shows
2,670.00 to 2,675.00 (5.00)	**DOLOMITE** light to dark gray, very fine to coarse crystalline, slightly fossiliferous, streaks poor to fair vug porosity, trace intercrystalline porosity pyrobitumen plugging in part, no fluorescence, scattered medium brown microcrystalline Dolomite as above, siliceous with abundant silicified spicules, tight, no shows
2,675.00 to 2,680.00 (5.00)	**DOLOMITE** off white to light gray, sample is 90% coarse to very coarse crystalline, fair intercrystalline and vug porosity, minor pyrobitumen, Dolomite rhombs to 2mm, trace clear hexagonal quartz crystals
2,680.00 to 2,685.00 (5.00)	**DOLOMITE** off white to light gray as above, coarse to very coarse crystalline, fair intercrystalline and vug porosity, minor pyrobitumen, scattered drusy Dolomite rhombs, increasing quartz crystals
2,685.00 to 2,690.00 (5.00)	**DOLOMITE** off white to light gray, medium to very coarse crystalline, sample mainly loose white coarse Dolomite crystals, fair vug and intercrystalline porosity, trace pyrobitumen
2,690.00 to 2,695.00 (5.00)	**DOLOMITE** dark gray with off white to light gray coarse Dolomite crystals, fine to coarse crystalline, slightly fossiliferous, fair intercrystalline and vug porosity, trace

pyrobitumen plugging, scattered drusy Dolomite rhombs to 2mm, rare trace twinned rhombohedral Dolomite crystals, trace quartz crystals

2,695.00 to 2,700.00 (5.00)
DOLOMITE
as above, increasing coarse to very coarse white Dolomite crystals, fair vug and intercrystalline porosity, no fluorescence, minor pyrobitumen

2,700.00 to 2,705.00 (5.00)
DOLOMITE
off white to light gray, sample predominately loose medium to very coarse Dolomite crystals, indicated fair vug porosity, trace intercrystalline porosity, mrn pyrobitumen, trace pyrite, rare trace green Shale, waxy, pyritic

2,705.00 to 2,710.00 (5.00)
DOLOMITE
medium gray, microcrystalline to very fine crystalline, clean, tight, no shows, trace stylolites

2,710.00 to 2,715.00 (5.00)
DOLOMITE
medium to dark gray to gray brown, very fine to fine crystalline, microsucrosic with pyrobitumen in part, trace fossil remnants, tight, no shows, trace white Dolomite veins, minor pyrobitumen

2,715.00 to 2,720.00 (5.00)
DOLOMITE
medium gray as above, very fine to fine crystalline, tight, no shows, interbedded DOLOMITE, very light gray, fine to coarse crystalline, streaks poor to fair vug porosity, trace intercrystalline porosity, no fluorescence, trace pyrobitumen, scattered loose coarse to very coarse Dolomite crystals, trace rhombs, trace quartz crystals

2,720.00 to 2,725.00 (5.00)
DOLOMITE
light to medium gray, brown gray in part, very fine to coarse crystalline, slightly fossiliferous, cherty with clear qtx inclusions, siliceous with scattered silty and sandy residue, poor to fair vug porosity, trace intercrystalline porosity, no fluorescence, trace pyrobitumen, trace disseminated pyrite

2,725.00 to 2,730.00 (5.00)
DOLOMITE
mainly dark gray, medium gray in part, trace light gray, very fine to fine crystalline, abundant black bituminous residue, slightly fossiliferous, tight with trace poor intercrystalline and vug porosity, no fluorescence, trace pyrobitumen, trace drusy Dolomite crystals and quartz crystals lining vugs, sample is 75% dark gray Dolomite, 25% coarse white crystals

2,730.00 to 2,735.00 (5.00)
DOLOMITE
medium to dark gray as above, very fine to medium crystalline, tight, no shows, trace pyrite, increasing coarse to very coarse white Dolomite crystals, trace Shale, medium gray green, waxy, pyritic with minor disseminated microcrystalline pyrite

2,735.00 to 2,740.00 (5.00)
DOLOMITE
off to light gray, fine to coarse crystalline, trace poor intercrystalline porosity with some pyrobitumen plugging, streaks poor vug porosity, no fluorescence, 80% loose medium to very coarse Dolomite crystals

2,740.00 to 2,745.00 (5.00)	**DOLOMITE** off white to light to medium gray, medium to very coarse crystalline, streaks fair to good vug porosity, no fluorescence, no pyrobitumen on coarse crystals, trace pyrobitumen in medium gray fine to medium crystalline Dolomite, abundant quartz crystals and crystal fragments
2,745.00 to 2,750.00 (5.00)	**DOLOMITE** light to medium gray, fine to coarse crystalline, fossiliferous, streaks fair vug porosity, trace intercrystalline porosity with pyrobitumen, no fluorescence, trace white Dolomite veins, trace stylolites, 80% of sample is loose white Dolomite crystals, trace green Shale streaks, pyritic with disseminated microcrystalline pyrite
2,750.00 to 2,755.00 (5.00)	**DOLOMITE** light to medium gray, medium to very coarse crystalline, fossiliferous, indicated fair vug porosity, no fluorescence, trace pyrobitumen, scattered loose Dolomite crystals, trace green pyritic Shale
2,755.00 to 2,760.00 (5.00)	**DOLOMITE** off white to light to medium gray, fine to coarse crystalline, fossiliferous, streaks fair vug porosity, trace intercrystalline with pyrobitumen, scattered Dolomite crystals, rhombs in part, trace clear quartz crystals, minor pyrite, increasing Shale, medium green to gray green, waxy in part, pyritic with disseminated microcrystalline pyrite
2,760.00 to 2,765.00 (5.00)	**DOLOMITE** off white to light to medium gray as above, fine to coarse crystalline, fossiliferous, streaks poor to fair vug porosity, scattered pyrobitumen, no fluorescence, trace pyrite, scattered Dolomite, dark gray, very fine to fine crystalline, fossiliferous, tight, no shows
2,765.00 to 2,770.00 (5.00)	**DOLOMITE** mainly medium gray, microcrystalline to fine crystalline, tight, no shows, scattered white to light gray coarse Dolomite as above, streaks poor vug porosity, trace green Shale streaks
2,770.00 to 2,775.00 (5.00)	**DOLOMITE** light to medium gray, fine to very coarse crystalline, slightly fossiliferous, mainly tight with streaks poor to fair vug porosity, trace intercrystalline porosity with pyrobitumen, no fluorescence, scattered drusy Dolomite crystals, minor Shale, mottled green to dark gray, pyritic, fissile, waxy in part
2,775.00 to 2,780.00 (5.00)	**DOLOMITE** off white to very light gray, sample is 80% coarse white Dolomite, 20% medium gray fine to coarse crystalline, mainly tight with trace poor vug porosity, scattered coarse to very coarse Dolomite crystals, mainly clean, pyrobitumen in part, trace clear quartz crystals
2,780.00 to 2,785.00 (5.00)	**DOLOMITE** as above, mainly off white coarse to very coarse crystals, indicated poor to fair vug porosity, no fluorescence, trace Dolomite rhombs, trace calcite crystals, trace quartz crystals, trace green Shale laminations

2,785.00 to 2,790.00 (5.00)	**DOLOMITE** medium to dark gray, fine to coarse crystalline, very fossiliferous, trace Amphipora? tight, no shows, interbedded DOLOMITE, off white to light gray, fine to very coarse crystalline, mainly loose Dolomite crystals, indicated fair vug porosity, no fluorescence, trace green Shale laminations
2,790.00 to 2,795.00 (5.00)	**DOLOMITE** medium to dark gray as above, tight, no shows, decreasing white Dolomite crystals
2,795.00 to 2,800.00 (5.00)	**DOLOMITE** off white to very light gray, medium to very coarse crystalline, streaks fair vug porosity with Dolomite rhombs and quartz crystals lining vugs, minor medium to dark gray fossiliferous Dolomite as above
2,800.00 to 2,805.00 (5.00)	**DOLOMITE** medium to dark gray, fine to coarse crystalline, fossiliferous, tight, no shows, scattered coarse to very coarse Dolomite crystals, clean, trace calcite crystals, trace quartz crystals, trace pyrite, trace green Shale streaks
2,805.00 to 2,810.00 (5.00)	**DOLOMITE** off white to very light gray, sample is 80% coarse to very coarse Dolomite crystals, siliceous to very siliceous with trace silicified Dolomite pseudomorphs, scattered siliceous residue, indicated poor to fair vug porosity, mainly clean, trace pyrobitumen, scattered Dolomite rhombs, minor clear quartz crystals
2,810.00 to 2,815.00 (5.00)	**DOLOMITE** off white to light gray as above, 65% coarse white Dolomite crystals, 35% mottled light to dark gray Dolomite, fine to coarse crystalline, tight with trace poor intercrystalline porosity, no shows, scattered drusy Dolomite rhombs and rosettes, trace pyrite, rare trace silver coloured sulfide, rhombohedral crystals, moderately soft
2,815.00 to 2,820.00 (5.00)	**DOLOMITE** off white to light gray as above, mainly medium to very coarse Dolomite crystals, siliceous with trace silicified Dolomite pseudomorphs, mainly tight with trace poor vug and intercrystalline porosity, no shows, trace Shale stringers, dark gray green, pyritic, waxy
2,820.00 to 2,825.00 (5.00)	**DOLOMITE** as above, mainly coarse to very coarse white crystals, siliceous with Dolomite pseudomorphs, tight, no shows, trace calcite crystals, trace clear quartz crystals
2,825.00 to 2,830.00 (5.00)	**DOLOMITE** medium to dark gray, mottled, fine to coarse crystalline, fossiliferous, trace Amphipora, tight with possible poor vug porosity, no shows, scattered coarse to very coarse Dolomite crystals, trace quartz crystals; 60% dark Dolomite, 40% coarse white crystals
2,830.00 to 2,835.00 (5.00)	**DOLOMITE** light to dark gray, 60% white coarse crystals, 40% dark mottled Dolomite, fine to coarse crystalline, fossiliferous, siliceous with pseudomorphs and silty residue, mainly tight with trace vug and fracture porosity, no shows, trace quartz crystals,

hexagonal in part

2,835.00 to 2,840.00 (5.00) **DOLOMITE**
light to dark gray, mottled, fine to coarse crystalline, fossiliferous, siliceous in part, tight with streaks poor vug porosity, trace fracture porosity, no shows, trace quartz crystals

2,840.00 to 2,845.00 (5.00) **DOLOMITE**
light to dark gray as above, tight, no shows, increasing clear quartz crystals, trace Limestone, dark gray brown, cryptocrystalline to microcrystalline, tight, no shows

2,845.00 to 2,850.00 (5.00) **DOLOMITE**
as above, light to dark gray, mottled, fine to very coarse crystalline, siliceous with Dolomite pseudomorphs, tight with trace vug and fracture porosity, no shows, trace quartz crystals

2,850.00 to 2,855.00 (5.00) **DOLOMITE**
as above, 60% coarse white Dolomite crystals, 40% medium to dark mottled Dolomite host rock, siliceous and cherty, tight with streaks poor intercrystalline, vug and fracture porosity, no shows, trace pyrobitumen, trace quartz crystals

2,855.00 to 2,860.00 (5.00) **DOLOMITE**
as above, white to light to dark gray, mottled, fine to very coarse crystalline, siliceous with Dolomite pseudomorphs and clear quartz crystals, trace poor vug and fracture porosity, no shows, trace Shale streaks, medium to dark green, waxy, pyritic

2,860.00 to 2,865.00 (5.00) **DOLOMITE**
off white to light to dark gray, fine to very coarse crystalline, trace fossil remnants, siliceous with scattered pseudomorphs, mainly tight with trace poor fracture and vug porosity, no shows, trace Shale stringers, medium to dark gray green, trace dark gray, waxy, pyritic with disseminated microcrystalline pyrite

2,865.00 to 2,870.00 (5.00) **DOLOMITE**
as above, increasing coarse white Dolomite crystals to 70%, siliceous with pseudomorphs and quartz inclusions, mainly tight with poor vug and fracture porosity, no shows, trace Shale streaks, green, waxy, pyritic

2,870.00 to 2,875.00 (5.00) **DOLOMITE**
light to dark gray as above, fine to coarse crystalline with abundant off white coarse to very coarse crystals, fossiliferous, mainly tight with trace fracture porosity, no shows, rare trace pyrobitumen, trace Dolomite rhombs and hexagonal quartz

2,875.00 to 2,880.00 (5.00) **DOLOMITE**
off white to light to medium gray, fine to coarse crystalline with abundant coarse to very coarse white crystals, siliceous, mainly tight with trace fracture porosity, no shows, trace Shale streaks, medium to dark gray green, waxy, pyritic with disseminated microcrystalline pyrite in part, sample is 80% coarse white Dolomite crystals

2,880.00 to 2,885.00 (5.00) **DOLOMITE**
as above, mainly coarse white crystals, trace intercrystalline porosity with

pyrobitumen plugging, decreasing green Shale streaks

2,885.00 to 2,890.00 (5.00)
DOLOMITE
off white to light to medium gray, fine to very coarse crystalline, siliceous in part, mainly tight with trace fracture and vug porosity, trace intercrystalline porosity with pyrobitumen, no shows, trace Shale streaks, medium to dark green to gray green, waxy, trace pyrite

2,890.00 to 2,895.00 (5.00)
DOLOMITE
as above, mainly off white to light gray, increasing intercrystalline porosity plugged with pyrobitumen, no fluorescence

2,895.00 to 2,900.00 (5.00)
DOLOMITE
off white to light to medium gray, fine to very coarse crystalline, slightly siliceous in part with trace cherty residue, poor intercrystalline porosity with pyrobitumen plugging in part, trace vug porosity, no shows, trace Shale streaks, medium green, waxy, pyritic with scattered disseminated microcrystalline pyrite

2,900.00 to 2,905.00 (5.00)
DOLOMITE
light to medium gray as above, to dark gray in part, fine to coarse crystalline, siliceous in part with trace crystal pseudomorphs, trace poor intercrystalline porosity with pyrobitumen plugging in part, trace fracture porosity, no fluorescence, trace fine to medium Dolomite crystals growing on fracture plane? or vugs?

2,905.00 to 2,910.00 (5.00)
DOLOMITE
medium to dark gray, microcrystalline, slightly calcareous with trace white calcite veins, minor bituminous residue, slightly silty, tight, no shows, scattered white calcite and dolomite healed microfractures, trace disseminated microcrystalline pyrite

2,910.00 to 2,915.00 (5.00)
DOLOMITE
medium gray as above, microcrystalline to very fine crystalline, slightly argillaceous and silty, tight, no shows, trace recemented microfractures

2,915.00 to 2,920.00 (5.00)
DOLOMITE
medium gray, microcrystalline, tight, no shows, trace microfractures to 2mm healed with white Dolomite

2,920.00 to 2,925.00 (5.00)
DOLOMITE
off white to light to medium gray, very fine to coarse crystalline, slightly siliceous with scattered silicified Dolomite pseudomorphs, trace poor intercrystalline, vug and fracture porosity, no shows, intercrystalline plugged with pyrobitumen, trace very fine to coarse Dolomite crystals on vug or fracture planes

2,925.00 to 2,930.00 (5.00)
DOLOMITE
medium to dark gray, fine to coarse crystalline, scattered bituminous residue, streaks poor to fair intercrystalline porosity with pyrobitumen plugging in part, no fluorescence, trace pyrite

2,930.00 to 2,935.00 (5.00)
DOLOMITE
off white to light to dark gray, fine to coarse crystalline, slightly siliceous in part with fine silty residue, fossiliferous, poor intercrystalline porosity mainly pyrobitumen

	plugged, trace fracture and vug porosity with drusy crystal growths, 40% coarse white Dolomite crystals, 60% medium to dark gray Dolomite
2,935.00 to 2,940.00 (5.00)	**DOLOMITE** medium to dark gray, mainly fine to medium crystalline, scattered coarse crystalline white Dolomite, slightly fossiliferous, mainly tight with trace poor intercrystalline porosity with pyrobitumen plugging, no fluorescence
2,940.00 to 2,945.00 (5.00)	**DOLOMITE** medium to dark gray, fine to medium crystalline, trace coarse crystalline, fossiliferous, trace Amphipora?, tight, no shows, minor pyrobitumen, trace microsucrosic very fine crystalline Dolomite with abundant pyrobitumen, trace green Shale streaks
2,945.00 to 2,950.00 (5.00)	**DOLOMITE** medium gray, light to medium gray in part, very fine to medium crystalline, fossiliferous, streaks poor to fair intercrystalline porosity, pyrobitumen plugged in part, poor vug porosity with minor drusy Dolomite rhombs
2,950.00 to 2,955.00 (5.00)	**DOLOMITE** as above, mainly medium gray, very fine to medium crystalline, mainly tight with trace poor intercrystalline and vug porosity, no fluorescence, trace pyrobitumen, trace microfractures cemented with white dolomite, trace white coarse Dolomite crystals
2,955.00 to 2,960.00 (5.00)	**DOLOMITE** off white to light to dark gray, very fine to coarse crystalline, slightly fossiliferous, tight with trace poor intercrystalline and trace vug porosity, no shows, trace white dolomite veins
2,960.00 to 2,965.00 (5.00)	**DOLOMITE** light to medium gray, dark gray in part, fine to coarse crystalline, slightly fossiliferous, mainly tight with trace poor intercrystalline porosity, pyrobitumen plugged, trace coarse white Dolomite crystals and rhombs
2,965.00 to 2,970.00 (5.00)	**DOLOMITE** light to dark gray, very fine to medium crystalline, trace coarse crystalline, slightly fossiliferous, mainly tight with trace very poor intercrystalline porosity, no shows, pyrobitumen plugging in part, rare trace pin point porosity, no shows, increasing coarse to very coarse white Dolomite, trace calcite crystals
2,970.00 to 2,975.00 (5.00)	**DOLOMITE** medium to dark gray, very fine to fine crystalline, to medium crystalline in part, trace coarse crystalline, fossiliferous, tight, no shows, trace stylolites, minor Chert, medium to dark gray
2,975.00 to 2,980.00 (5.00)	**DOLOMITE** very light gray to dark gray, very fine to medium crystalline, to coarse crystalline in part, slightly fossiliferous, streaks poor intercrystalline porosity with pyrobitumen plugging in part, no fluorescence, trace hexagonal quartz crystals, trace Dolomite rhombs

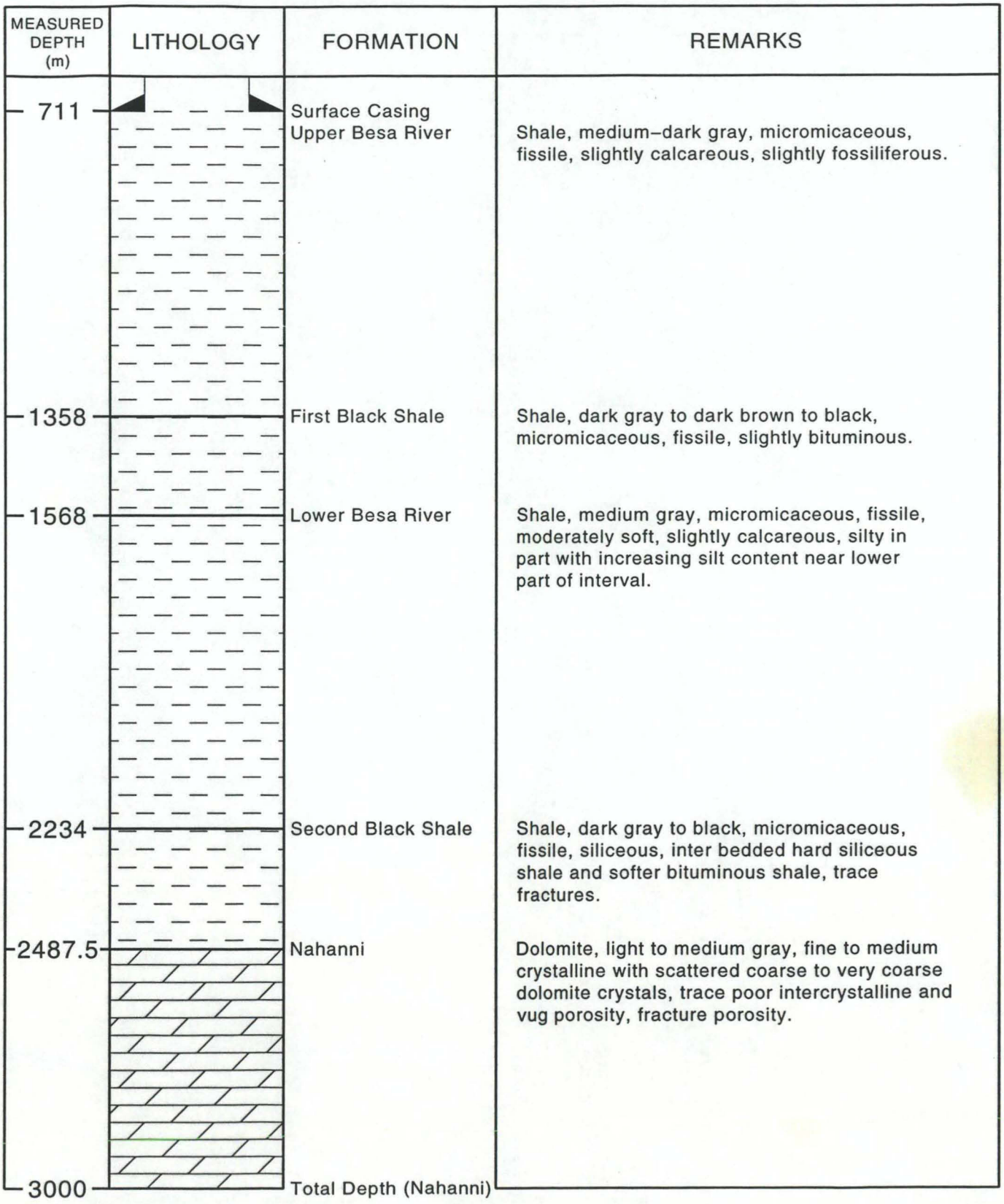
2,980.00 to 2,985.00 (5.00)	**DOLOMITE** as above, streak light gray Dolomite, fine to medium crystalline, poor to fair intercrystalline porosity with pyrobitumen plugging
2,985.00 to 2,990.00 (5.00)	**DOLOMITE** light to medium gray, fine to coarse crystalline, fossiliferous with scattered unrecognizable fossil shadows, streaks poor intercrystalline porosity mainly pyrobitumen plugged, no fluorescence, minor medium gray Chert
2,990.00 to 2,995.00 (5.00)	**DOLOMITE** light to dark gray, very fine to medium crystalline, siliceous, mainly tight with trace fracture porosity, no shows, minor coarse white Dolomite crystals
2,995.00 to 3,000.00 (5.00)	**DOLOMITE** mainly medium gray, light to dark gray in part, very fine to medium crystalline, siliceous, microsucrosic with scattered pyrobitumen in part, mainly tight with trace intercrystalline and vug porosity, pyrobitumen plugging intercrystalline porosity, trace drusy Dolomite rhombs, trace pyrite, trace Chert, medium gray

Well Stratigraphy Column

Chevron et al Liard K–29

60° 30' , 123° 30'

Grd = 409.6 m KB = 418.8 m



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