



Weatherford
LABORATORIES

TOTAL ORGANIC CARBON, PROGRAMMED PYROLYSIS DATA
WHITING PETROLEUM CORPORATION

Well Name : Two Mile Creek #22-33M	Operator : J. Kurek	State : CO	Weatherford Labs Project
	SRA ID : Fletch Junior	County : Weld	CO-51715

Weatherford Labs ID	Median Depth (feet)	Formation	Sample Type	Sample Prep	*	TOC	S1	S2	S3	Tmax (°C)	**	Meas. % Ro	HI	OI	S2/S3	S1/TOC *100	PI	Notes		Lab ID
																		Checks	Pyrogram	
1-2G	5552.3	Undisclosed	Core	NOPR		3.88	11.28	17.22	0.35	442			444	9	49	291	0.40			51715-1-2G.RAV
1-9G	5559.2	Undisclosed	Core	NOPR		2.31	12.06	8.32	0.35	436			360	15	24	522	0.59			51715-1-9G.RAV
1-15G	5565.5	Undisclosed	Core	NOPR		2.08	6.38	8.40	0.29	441			404	14	29	307	0.43			51715-1-15G.RAV
1-23G	5573.2	Undisclosed	Core	NOPR		1.99	8.01	7.81	0.29	440			392	15	27	403	0.51			51715-1-23G.RAV
2-38G	5588.2	Undisclosed	Core	NOPR		1.68	6.33	5.17	0.28	441			308	17	18	377	0.55			51715-2-38G.RAV
2-43G	5593.5	Undisclosed	Core	NOPR		1.86	5.47	5.59	0.33	438			301	18	17	294	0.49			51715-2-43G.RAV
2-46G	5596.5	Undisclosed	Core	NOPR		4.86	2.27	15.60	0.29	436			321	6	54	47	0.13			51715-2-46G.RAV
2-52G	5602.5	Undisclosed	Core	NOPR		1.52	6.15	5.21	0.32	433			343	21	16	405	0.54			51715-2-52G.RAV
2-61G	5611.5	Undisclosed	Core	NOPR		2.34	7.54	8.71	0.36	442			372	15	24	322	0.46			51715-2-61G.RAV
2-65G	5615.2	Undisclosed	Core	NOPR		2.84	6.57	11.32	0.28	444			399	10	40	231	0.37			51715-2-65G.RAV
2-72G	5622.5	Undisclosed	Core	NOPR		2.73	8.58	10.47	0.31	439			384	11	34	314	0.45			51715-2-72G.RAV
2-76G	5626.3	Undisclosed	Core	NOPR		2.96	6.46	10.83	0.34	438			366	11	32	218	0.37			51715-2-76G.RAV
2-84G	5634.5	Undisclosed	Core	NOPR		3.93	9.84	16.35	0.32	440			416	8	51	250	0.38			51715-2-84G.RAV
2-94G	5644.5	Undisclosed	Core	NOPR		4.92	4.84	20.24	0.32	439			411	7	63	98	0.19			51715-2-94G.RAV
2-97G	5647.5	Undisclosed	Core	NOPR		3.42	11.82	13.45	0.36	444			393	11	37	346	0.47			51715-2-97G.RAV
2-101G	5651.2	Undisclosed	Core	NOPR		2.65	4.81	10.68	0.36	442			403	14	30	182	0.31			51715-2-101G.RAV
2-108G	5658.2	Undisclosed	Core	NOPR		2.12	8.81	9.02	0.28	443			425	13	32	416	0.49			51715-2-108G.RAV
2-113G	5663.6	Undisclosed	Core	NOPR		2.46	7.89	10.22	0.35	443			415	14	29	321	0.44			51715-2-113G.RAV
2-116G	5666.2	Undisclosed	Core	NOPR		2.36	8.03	9.66	0.30	441			409	13	32	340	0.45			51715-2-116G.RAV
2-126G	5676.4	Undisclosed	Core	NOPR		2.61	10.89	11.52	0.29	441			441	11	40	417	0.49			51715-2-126G.RAV
3-1G	5679.2	Undisclosed	Core	NOPR		4.29	3.46	17.88	0.28	441			417	7	64	81	0.16			51715-3-1G.RAV
3-5G	5683.4	Undisclosed	Core	NOPR		2.09	10.65	9.42	0.33	441			451	16	29	510	0.53			51715-3-5G.RAV
3-13G	5691.4	Undisclosed	Core	NOPR		2.07	8.68	9.76	0.28	441			471	14	35	419	0.47			51715-3-13G.RAV
3-15G	5693.2	Undisclosed	Core	NOPR		2.26	7.08	9.50	0.34	442			420	15	28	313	0.43			51715-3-15G.RAV
3-17G	5695.7	Undisclosed	Core	NOPR		1.80	9.81	8.98	0.28	441			499	16	32	545	0.52			51715-3-17G.RAV
3-20G	5698.6	Undisclosed	Core	NOPR		1.91	5.84	8.34	0.34	443			437	18	25	306	0.41			51715-3-20G.RAV
3-22G	5700.2	Undisclosed	Core	NOPR		1.85	7.48	8.29	0.31	444			448	17	27	404	0.47			51715-3-22G.RAV
3-24G	5702.8	Undisclosed	Core	NOPR		2.28	8.47	10.49	0.31	443			460	14	34	371	0.45			51715-3-24G.RAV
3-28G	5706.2	Undisclosed	Core	NOPR		1.86	9.65	9.59	0.26	443			516	14	37	519	0.50			51715-3-28G.RAV
3-34G	5712.2	Undisclosed	Core	NOPR		1.73	11.98	9.49	0.26	440			549	15	37	692	0.56			51715-3-34G.RAV
3-37G	5715.8	Undisclosed	Core	NOPR		2.01	9.95	10.20	0.21	445			507	10	49	495	0.49			51715-3-37G.RAV
3-41G	5719.4	Undisclosed	Core	NOPR		1.82	9.69	9.55	0.22	442			525	12	43	532	0.50			51715-3-41G.RAV
3-44G	5722.6	Undisclosed	Core	NOPR		2.29	5.28	10.78	0.23	444			471	10	47	231	0.33			51715-3-44G.RAV
3-48G	5726.7	Undisclosed	Core	NOPR		2.23	5.34	10.48	0.19	443			470	9	55	239	0.34			51715-3-48G.RAV
3-52G	5730.1	Undisclosed	Core	NOPR		2.48	7.60	11.82	0.19	445			477	8	62	306	0.39			51715-3-52G.RAV
3-58G	5736.7	Undisclosed	Core	NOPR		2.80	5.73	12.79	0.23	445			457	8	56	205	0.31			51715-3-58G.RAV
3-72G	5750.3	Undisclosed	Core	NOPR		2.04	3.32	9.06	0.19	442			444	9	48	163	0.27			51715-3-72G.RAV
4-29G	5800.7	Undisclosed	Core	NOPR		3.12	5.07	14.62	0.23	444			469	7	64	163	0.26			51715-4-29G.RAV
4-36G	5807.2	Undisclosed	Core	NOPR		3.02	5.25	15.03	0.20	444			498	7	75	174	0.26			51715-4-36G.RAV
4-60G	5831.2	Undisclosed	Core	NOPR		1.73	5.97	7.84	0.24	444			453	14	33	345	0.43			51715-4-60G.RAV
4-87G	5858.1	Undisclosed	Core	NOPR		0.54	4.38	2.47	0.18	434			457	33	14	811	0.64			51715-4-87G.RAV
4-92G	5863.2	Undisclosed	Core	NOPR		0.23	0.30	0.45	0.22	442	**		197	96	2	132	0.40			51715-4-92G.RAV
5-5G	5870.6	Undisclosed	Core	NOPR		0.09	0.12	0.12	0.29	419	**		128	310	0	128	0.50			51715-5-5G.RAV
5-16G	5881.1	Undisclosed	Core	NOPR		0.11	0.12	0.29	0.21	430	**		269	194	1	111	0.29			51715-5-16G.RAV
5-31G	5896.3	Undisclosed	Core	NOPR		0.19	0.25	0.37	0.27	442	**		193	141	1	130	0.40			51715-5-31G.RAV
5-45G	5910.1	Undisclosed	Core	NOPR		0.97	7.98	4.82	0.08	432			496	8	60	822	0.62			51715-5-45G.RAV
5-48G	5911.4	Undisclosed	Core	NOPR		1.15	0.30	2.64	0.21	443			230	18	13	26	0.10			51715-5-48G.RAV



**TOTAL ORGANIC CARBON, PROGRAMMED PYROLYSIS DATA
WHITING PETROLEUM CORPORATION**

Well Name : Two Mile Creek #22-33M	Operator : J. Kurek	State : CO	Weatherford Labs Project
	SRA ID : Fletch Junior	County : Weld	CO-51715

Weatherford Labs ID	Median Depth (feet)	Formation	Sample Type	Sample Prep	*	TOC	S1	S2	S3	Tmax (°C)	**	Meas. % Ro	HI	OI	S2/S3	S1/TOC *100	PI	Notes		Lab ID
																		Checks	Pyrogram	
7-32G	6014.6	Undisclosed	Core	NOPR		1.39	0.58	3.78	0.16	446			272	12	24	42	0.13			51715-7-32G.RA\
8-6G	6023.5	Undisclosed	Core	NOPR		1.32	0.53	3.09	0.15	447			234	11	21	40	0.15			51715-8-6G.RAV
8-17G	6034.8	Undisclosed	Core	NOPR		1.32	0.53	3.06	0.18	446			232	14	17	40	0.15			51715-8-17G.RA\
8-25G	6042.8	Undisclosed	Core	NOPR		1.57	0.50	3.59	0.16	446			229	10	22	32	0.12			51715-8-25G.RA\
8-30G	6047.3	Undisclosed	Core	NOPR		1.63	0.61	4.01	0.17	447			246	10	24	37	0.13			51715-8-30G.RA\
8-36G	6053.4	Undisclosed	Core	NOPR		1.62	0.56	3.79	0.16	447			234	10	24	35	0.13			51715-8-36G.RA\
8-42G	6059.3	Undisclosed	Core	NOPR		0.80	1.03	2.38	0.21	450			299	26	11	129	0.30			51715-8-42G.RA\
8-46G	6063.4	Undisclosed	Core	NOPR		0.55	1.09	1.58	0.17	445			289	31	9	199	0.41			51715-8-46G.RA\
8-52G	6069.3	Undisclosed	Core	NOPR		1.18	0.79	3.59	0.29	446			304	25	12	67	0.18			51715-8-52G.RA\
8-55G	6072.9	Undisclosed	Core	NOPR		1.83	1.10	7.34	0.22	446			401	12	33	60	0.13			51715-8-55G.RA\
8-62G	6079.4	Undisclosed	Core	NOPR		1.76	0.92	5.34	0.24	447			303	14	22	52	0.15			51715-8-62G.RA\
8-64G	6081.2	Undisclosed	Core	NOPR		1.41	1.20	5.14	0.17	448			365	12	30	85	0.19			51715-8-64G.RA\
8-69G	6086.4	Undisclosed	Core	NOPR		1.97	1.65	6.88	0.26	447			349	13	26	84	0.19			51715-8-69G.RA\
8-72G	6089.4	Undisclosed	Core	NOPR		2.68	2.27	9.36	0.24	447			349	9	39	85	0.20			51715-8-72G.RA\
8-76G	6093.3	Undisclosed	Core	NOPR		2.05	3.12	7.04	0.28	447			343	14	25	152	0.31			51715-8-76G.RA\
8-79G	6096.3	Undisclosed	Core	NOPR		2.75	2.14	8.98	0.26	449			327	9	35	78	0.19			51715-8-79G.RA\
8-83G	6100.7	Undisclosed	Core	NOPR		2.73	3.27	9.56	0.26	449			350	10	37	120	0.25			51715-8-83G.RA\
8-87G	6105.0	Undisclosed	Core	NOPR		2.99	2.10	9.48	0.25	449			317	8	38	70	0.18			51715-8-87G.RA\
8-89G	6106.2	Undisclosed	Core	NOPR		2.71	1.66	7.92	0.20	449			292	7	40	61	0.17			51715-8-89G.RA\
8-92G	6109.2	Undisclosed	Core	NOPR		2.65	1.97	8.49	0.25	449			320	9	34	74	0.19			51715-8-92G.RA\

Notes:

"-1" - not measured or invalid value for T_{max}
TOC - Total Organic Carbon, wt. %

S1 - volatile hydrocarbon (HC) content, mg HC/ g rock
S2 - remaining HC generative potential, mg HC/ g rock
S3 - carbon dioxide content, mg CO₂/ g rock

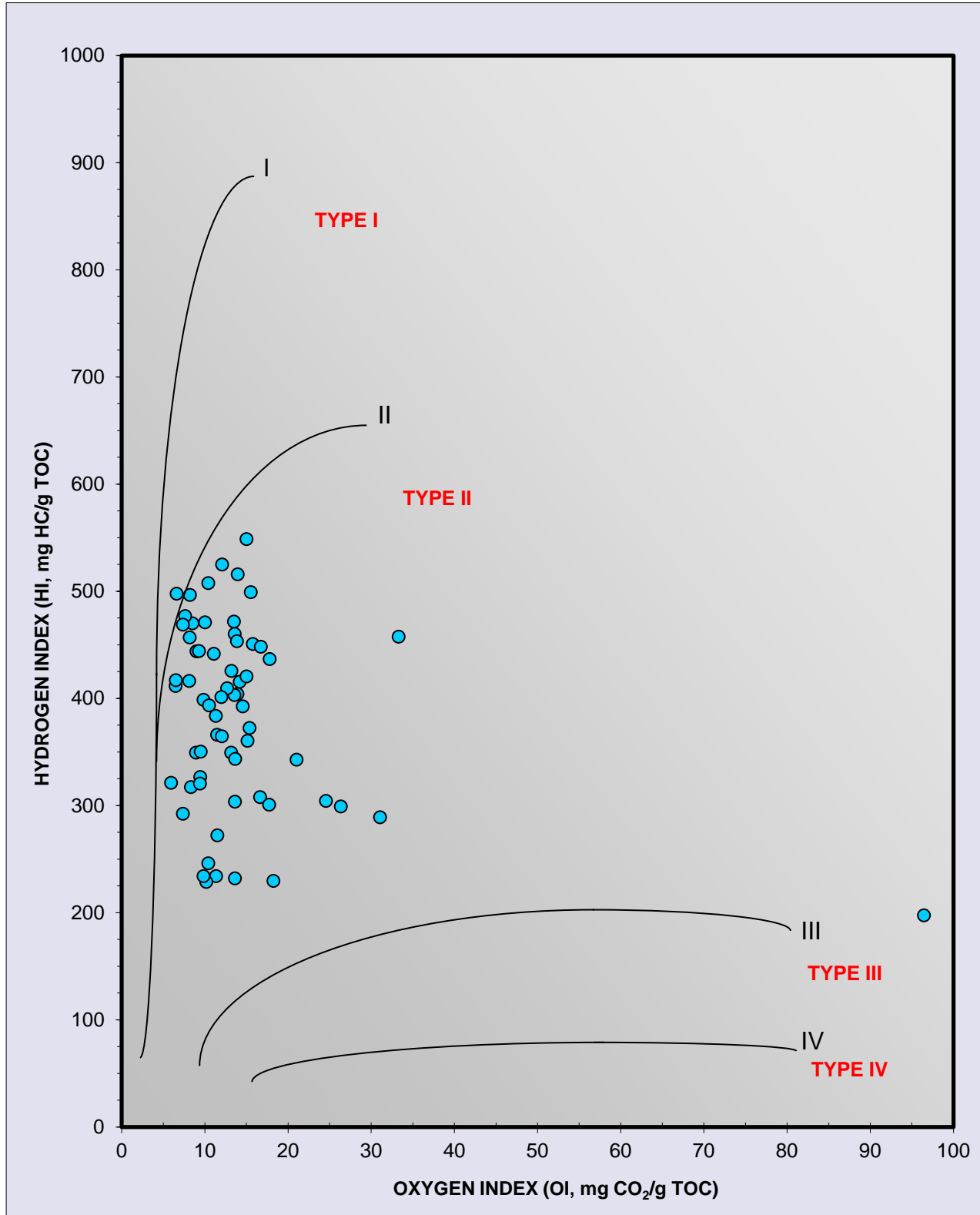
* - comments regarding contamination
** - low S2, Tmax is unreliable

Meas. %Ro - measured vitrinite reflectance
HI - Hydrogen index = S2 x 100 / TOC, mg HC/ g TOC
OI - Oxygen Index = S3 x 100 / TOC, mg CO₂/ g TOC
PI - Production Index = S1 / (S1+S2)

Pyrogram:

f - flat S2 peak
n - normal
ltS2sh - low temperature S2 shoulder
ltS2p - low temperature S2 peak
htS2p - high temperature S2 peak

RE - Programmed pyrolysis on Rock-Eval instrument
EXT - Extracted Rock
NOPR - Normal Preparation



KEROGEN TYPE AND MATURITY (Tmax) - Two Mile Creek #22-33M

Company: Whiting Petroleum Corporation

Project #: CO-51715

