

Table 1-5. Chemical and isotopic data for samples from the CW core (see text for description of analytical methods).
 [insuff, insufficient amount recovered for isotopic analyses; blanks indicate no data]

FIELD ID	Depth (ft)	Depth (m)	Member	Description	Photo of sample	Thin section	oil yield gal/ton ¹	C _{organic} %	δ ¹³ C _{organic} ‰ ²	H-index mg/g ³	O-index mg/g ³	Al ₂ O ₃ %	CaO %	Fe ₂ O ₃ %	K ₂ O %	MgO %	Na ₂ O %	P ₂ O ₅ %	SiO ₂ %	TiO ₂ %	Al %	As mg/kg	Ba mg/kg	Ca %	Ce mg/kg
CW-38	1873.4	571.0	Mahogany Zone	oil shale	no	polished	8	3.4	-29.6	635	135	8.5	16	3.7	4.1	5.0	1.9	0.11	35	0.31	4.5	20	400	12	44
CW-37	1926.2	587.1	Mahogany Zone	oil shale	no	unpolished	9	3.5				7.7	18	3.3	1.4	5.5	3.0	0.08	34	0.28	4.1	20	580	13	38
CW-36	1957.6	596.7	Mahogany Zone	oil shale	no	unpolished	9	6.6				5.3	24	2.6	1.9	6.7	1.3	0.12	22	0.19	2.9	<20	580	17	33
CW-35	1986.8	605.6	Mahogany Zone	oil shale	no	polished	13	6.2				4.7	24	2.2	0.86	6.7	2.0	0.07	25	0.16	2.5	10	520	17	21
CW-34	2047.8	624.2	Mahogany Zone	oil shale	no	polished	22	11				5.8	17	2.6	1.7	6.7	1.7	0.15	28	0.21	3.2	30	440	12	29
CW-33	2105.6	641.8	Mahogany Zone	oil shale	no	polished	16	7.2				4.5	12	2.1	1.3	3.0	1.4	0.06	52	0.11	2.4	110	320	8.9	30
CW-32	2137.8	651.6	Mahogany Zone	oil shale	no	unpolished	24	8.2				5.5	24	2.3	1.8	4.4	1.6	0.40	26	0.22	3.0	40	590	17	34
CW-31	2167.9	660.8	Mahogany Zone	oil shale	no	unpolished	15	5.6	-29.8	700	100	7.0	20	2.9	1.6	5.9	2.5	0.07	30	0.24	3.8	90	420	14	31
CW-30	2197.2	669.7	Mahogany Zone	oil shale	no	unpolished	25	26	-32.5			4.4	13	2.4	1.1	6.0	2.1	0.50	20	0.15	2.4	20	360	9.1	25
CW-29	2232.8	680.6	Mahogany Zone	oil shale	no	polished	59	27	-28.5	995	26	4.1	13	2.9	0.79	4.6	1.6	0.45	21	0.15	2.2	110	330	9.1	21
CW-28	2287.4	697.2	Mahogany Zone	oil shale	no	polished	16	2.5		580	71	3.5	23	2.3	0.98	11	1.4	0.07	24	0.12	1.9	<20	500	16	19
CW-27	2317.4	706.3	Parachute Creek	marlstone	no	polished	16	4.9	-31.2			2.4	8.5	1.4	0.84	3.2	0.59	0.11	65	0.07	1.3	30	310	6.3	10
CW-26	2349.2	716.0	Parachute Creek	marlstone	no	unpolished	4	2.4	-30.8	595	63	12	11	5.2	3.1	4.2	4.4	0.10	39	0.48	6.4	<20	380	8.1	46
CW-25	2380.4	725.5	Parachute Creek	silty marlstone	no	polished	2	0.9				12	11	3.4	4.6	5.8	3.1	0.08	41	0.45	6.2	10	510	7.7	65
CW-24	2407.1	733.7	Parachute Creek	marlstone	no	unpolished	9	3.2	-31.1			4.9	22	1.9	2.4	11	1.0	0.17	22	0.18	2.7	<20	640	16	27
CW-23	2467.2	752.0	Parachute Creek	pyritic oil shale	no	polished	12	4.9	-31.0			7.1	16	3.1	1.9	9.3	2.0	0.11	29	0.24	3.8	20	530	11	33
CW-22	2499.8	761.9	Parachute Creek	oil shale	no	unpolished	7	2.4	-31.5			4.3	25	1.4	0.93	11	1.7	0.10	21	0.19	2.3	<20	670	18	21
CW-21	2527.8	770.5	Parachute Creek	pyritic marlstone	no	polished	5	2.8	-30.3			13	7.2	5.4	3.7	5.0	3.4	0.12	43	0.44	6.9	<20	550	5.2	57
CW-20	2587.9	788.8	Parachute Creek	pyritic oil shale	no	polished	18	7.6	-28.3	850	27	13	5.6	6.0	2.8	3.6	4.1	0.11	43	0.45	6.7	20	440	4.0	55
CW-19	2647.3	806.9	Parachute Creek	marly oil shale	no	polished	3	0.7	-28.3			6.4	19	2.2	3.4	8.2	0.77	0.09	34	0.28	3.5	<20	480	14	41
CW-18	2674.4	815.2	Parachute Creek	pyritic marlstone	no	polished	2	1.2	-30.3	340	45	11	14	4.8	3.5	4.8	3.1	0.11	37	0.38	6.0	<20	680	10	57
CW-17	2707.1	825.1	Parachute Creek	pyritic, tuffaceous marlstone	no	polished	18	8.6	-30.8			6.1	13	1.9	2.2	12	1.2	0.06	29	0.21	3.3	<20	580	9.3	26
CW-16	2767.2	843.4	Parachute Creek	oil shale	no	polished	30	19	-32.0			7.5	9.6	3.0	2.0	4.3	1.6	0.26	34	0.26	4.0	10	360	6.9	35
CW-15	2827.6	861.9	Parachute Creek	pyritic marlstone	no	polished	4	1.1	-30.5			13	10	5.8	2.2	6.6	4.1	0.21	37	0.44	6.6	10	720	7.2	65
CW-14	2857.5	871.0	Parachute Creek	oil shale	no	polished	10	4.8	-30.7			6.4	18	2.5	1.5	10	1.6	0.16	26	0.22	3.5	<20	540	13	31
CW-13	2887.7	880.2	Parachute Creek	pyritic oil shale	no	polished	12	5.8	-30.3	665	41	6.0	17	5.4	0.92	9.8	2.1	0.11	25	0.32	3.2	150	460	12	24
CW-12	2946.8	898.2	Parachute Creek	silty mudstone	no	unpolished	4	1.3	-30.0			5.8	21	3.7	1.4	11	1.5	0.11	24	0.23	3.2	<20	490	15	32
CW-11	2977.2	907.5	Parachute Creek	silty mudstone	no	polished	2	1.8	-30.8	605	53	12	11	3.3	2.6	5.4	3.0	0.19	43	0.55	6.2	<20	530	7.9	65
CW-10	3007.4	916.7	Douglas Creek	calcareous mudstone	no	polished	1	0.6	-28.4			11	14	5.4	2.1	4.4	2.9	0.14	40	0.50	5.6	20	520	10	60
CW-9	3037.2	925.7	Douglas Creek	calcareous mudstone	no	unpolished	0	0.5	-26.5			16	5.6	5.1	3.3	2.8	3.4	0.19	53	0.67	8.0	20	420	3.9	82
CW-8	3067.1	934.9	Douglas Creek	mudstone	no	polished	0	0.4	-26.3			15	4.9	5.9	2.8	2.6	3.7	0.17	53	0.63	7.9	<20	390	3.5	74
CW-7	3127.6	953.3	Douglas Creek	tuffaceous mudstone	no	polished	0	0.9	-30.2			11	10	3.9	2.5	3.7	2.3	0.15	51	0.55	5.9	<20	530	7.2	62
CW-6	3186.6	971.3	Douglas Creek	silty mudstone	no	polished	0	0.6	-28.1			12	13	5.5	2.2	4.3	2.9	0.17	41	0.49	6.4	10	510	8.9	73
CW-5A	3217.0	980.5	Douglas Creek	silty, calcareous mudstone	no	polished	0	0.5	-27.7			14	7.4	5.6	2.9	2.7	2.2	0.16	51	0.60	7.4	<20	450	5.3	72
CW-5	3247.7	989.9	Douglas Creek	mudstone	no	polished	0	0.6	-28.0			12	9.8	4.4	2.6	2.3	2.3	0.17	52	0.54	6.4	<20	3000	7.0	63
CW-4	3307.0	1008.0	Douglas Creek	mudstone	no	polished	0	0.3	-26.1			7.4	9.0	3.0	1.1	1.4	2.5	0.13	64	0.36	3.9	<20	3100	6.6	43
CW-3	3367.0	1026.3	Douglas Creek	oil shale	no	unpolished	13	6.2	-29.9			5.7	31	1.7	0.89	1.1	1.2	0.20	24	0.16	3.1	<20	985	22	28
CW-2	3396.9	1035.4	Douglas Creek	siltstone	no	polished	0	0.3	-26.0			9.5	8.9	4.2	1.6	2.4	2.6	0.17	58	0.51	5.0	<20	470	6.4	52
CW-1	3423.0	1043.3	Douglas Creek	oil shale	no	polished	12	3.3	-30.5	570	38	5.9	18	4.2	1.2	11	1.4	0.08	24	0.21	3.2	20	13	36	20

¹Data extrapolated from depth logs in Scott and Pantea (1982)

²Data from Dean and Anders (1991); Pitman (1996)

³Data from Dean and Anders (1991)

⁴Data from Pitman (1996)

⁵δ¹⁸O data converted from PDB to SMOW using δ¹⁸O_{SMOW} = 1.03086 (δ¹⁸O_{PDB}) + 30.86 (Hoefs, 1980)

Co mg/kg	Cr mg/kg	Cu mg/kg	Fe %	Ga mg/kg	K %	La mg/kg	Li mg/kg	Mg %	Mn mg/kg	Mo mg/kg	Na %	Nd mg/kg	Ni mg/kg	Pb mg/kg	P %	Sc mg/kg	Sr mg/kg	Th mg/kg	Ti %	V mg/kg	Y mg/kg	Zn mg/kg	S _{total} %	S _{SO4} %	S _{acidvolitile} %	S _{disulfide} %	S _{organic} %	δ ³⁴ S _{SO4} ‰ (CDT)
59	520	42	2.6	12	2.2	24	62	3.0	430	47	1.5	19	400	20	0.04	6	660	6	0.15	63	13	62				0.66	0.03	
39	460	38	2.3	11	1.3	20	100	3.3	440	39	2.5	14	360	13	0.03	7	720	5	0.13	59	10	86						
22	360	31	1.8	7	1.7	16	76	3.9	490	41	1.1	15	250	15	0.05	6	1000	5	0.11	76	9	40	<0.01	<0.01		0.01	0.05	insuff
26	390	26	1.5	6	0.83	11	180	4.0	460	39	1.7	11	280	12	0.03	4	1100	<4	0.10	50	7	38						
20	380	34	1.8	9	1.6	15	82	3.9	290	49	1.5	12	280	28	0.07	5	770	<4	0.11	90	9	49	<0.01	0.05		0.16	0.08	insuff
20	230	26	1.5	7	1.2	15	61	1.9	280	30	1.1	12	220	16	0.02	3	535	<4	0.06	25	7	33						
20	340	47	1.7	7	1.7	17	170	2.7	290	41	1.3	15	250	22	0.19	4	1200	<6	0.11	67	14	55	<0.01	<0.01		0.70	0.08	insuff
24	360	39	2	11	1.5	17	84	3.5	360	33	2.1	11	270	19	0.03	6	930	<4	0.13	67	7	59	<0.01	0.03		0.30	0.08	insuff
29	440	47	1.6	6	0.97	14	150	3.5	210	74	1.7	11	320	26	0.21	3	480	<4	0.09	66	8	47						
20	270	34	2	5	0.73	12	53	2.8	210	45	1.3	9	240	18	0.21	3	610	<4	0.08	82	7	47	0.23	<0.01		0.76	0.69	40.5
16	190	16	1.6	4	0.93	9	290	5.7	250	18	1.1	6	150	6	0.03	4	1300	<4	0.07	53	5	17	<0.01	<0.01		0.01	0.04	insuff
420	1600	32	0.99	<4	0.74	7	180	2.0	190	140	0.45	6	1400	5	0.04	<4	420	<4	0.04	26	5	7						
38	430	46	3.5	17	2.9	28	23	2.5	540	32	3.6	21	300	21	0.04	10	380	4	0.21	92	15	88	<0.01	<0.01		0.01	0.03	insuff
37	310	45	2.4	18	4.4	38	65	3.3	510	26	2.6	34	240	9	0.03	9	450	8	0.20	84	18	84	0.06	<0.01		0.39	0.03	40.8
39	380	17	1.3	8	2.4	13	270	6.0	320	37	0.84	12	260	9	0.08	5	1400	8	0.10	61	8	33	<0.01	<0.01		0.31	0.04	insuff
17	230	26	2.1	10	1.8	18	310	5.0	240	30	1.6	14	170	16	0.05	6	910	4	0.13	83	9	51	<0.01	<0.01		0.93	0.08	insuff
22	220	15	1	5	0.96	10	18	5.6	350	20	1.4	9	160	7	0.04	4	980	<4	0.09	36	7	21						
28	250	41	3.7	18	3.5	33	92	2.9	380	24	2.7	28	190	20	0.05	8	340	9	0.23	140	14	95	<0.01	0.05		0.17	0.04	insuff
24	300	58	4.1	17	2.5	34	94	2.1	390	35	3.2	26	220	26	0.04	7	210	7	0.24	120	12	110	<0.01	1.00		0.64	0.10	insuff
27	200	16	1.6	10	3.4	21	73	4.6	400	18	0.62	20	180	7	0.03	6	820	5	0.12	56	12	40	0.04			0.72	0.02	22.7
25	180	51	3.3	15	3.3	31	41	2.8	400	15	2.5	24	140	26	0.05	11	470	8	0.20	120	15	94	0.02	0.67		0.29	0.03	insuff
11	80	20	1.3	8	2.1	15	430	6.4	200	11	0.99	12	56	15	0.02	5	940	<4	0.11	80	7	47	<0.01	<0.01		0.01	0.09	insuff
18	170	47	2	12	1.8	19	290	2.5	240	26	1.3	17	130	20	0.11	6	440	4	0.14	110	9	68						
65	320	39	3.9	18	2.1	36	33	3.7	480	28	3.3	31	200	18	0.08	16	340	11	0.23	120	18	82	<0.01	<0.01		0.38	0.02	insuff
17	220	26	1.8	10	1.5	16	120	5.6	420	19	1.3	14	120	11	0.07	5	850	<4	0.12	82	9	47						
53	420	54	3.7	8	0.84	12	99	5.4	350	79	1.7	13	400	5	0.04	5	820	<4	0.16	61	7	29	<0.01	<0.01		3.3	0.12	insuff
16	130	14	2.6	8	1.4	15	45	5.7	470	8	1.3	14	100	6	0.04	5	700	<4	0.11	45	9	37						
31	250	46	2.3	16	2.4	35	65	3.1	460	23	2.4	29	200	17	0.08	10	500	11	0.27	110	19	82	<0.01	<0.01		0.03	0.02	insuff
37	210	31	3.7	14	2.0	32	48	2.6	920	17	2.3	28	200	17	0.06	10	500	9	0.24	77	18	61	<0.01	<0.01		0.84	0.01	insuff
19	110	42	3.4	20	2.8	45	66	1.6	350	4	2.6	38	75	20	0.08	13	200	13	0.35	120	21	89						
18	150	40	4	21	2.5	41	67	1.5	280	8	2.9	35	99	15	0.07	13	190	12	0.31	100	19	130	<0.01	<0.01		0.46	0.02	insuff
21	170	25	2.7	15	2.3	34	63	2.2	490	12	1.8	31	160	10	0.06	10	390	8	0.26	78	17	73						
21	180	33	3.7	16	2	40	43	2.5	850	11	2.3	33	140	16	0.07	13	450	10	0.25	87	21	110	<0.01	<0.01		1.3	0.01	insuff
20	140	32	3.8	19	2.7	40	55	1.6	400	7	1.7	34	110	20	0.06	12	270	12	0.29	96	19	93						
40	240	33	3	16	2.4	35	44	1.4	500	16	1.8	33	240	17	0.07	10	310	10	0.26	78	20	120	0.07	<0.01		0.16	0.02	38.2
190	700	28	2.1	6	1.0	22	29	0.87	980	61	1.9	22	900	9	0.05	4	680	6	0.10	29	14	38						
14	65	26	1.2	7	0.82	15	31	0.69	185	12	0.94	12	56	11	0.09	5	1600	<4	0.10	89	11	43	0.02	<0.01		0.59	0.08	insuff
61	330	30	2.9	10	1.4	28	38	1.4	600	27	2.1	26	360	12	0.07	7	220	7	0.20	54	17	57						
220	31	2.9	10	1.1	17	36	5.9	580	18	1.2	14	180	15	0.03	7	920	0.11	5	98	11	36	0.78	<0.01	<0.01		27.8	1.2	insuff

$\delta^{34}\text{S}_{\text{acid-volatile}} \text{‰ (CDT)}$	$\delta^{34}\text{S}_{\text{disulfide}} \text{‰ (CDT)}$	$\delta^{34}\text{S}_{\text{organic}} \text{‰ (CDT)}$	$\text{C}_{\text{carbonate}} \%$	$\delta^{13}\text{C}_{\text{calcite}} \text{‰ (PDB)}^4$	$\delta^{18}\text{O}_{\text{calcite}} \text{‰ (PDB)}^4$	$\delta^{18}\text{O}_{\text{calcite}} \text{‰ (SMOW)}^5$	$\delta^{13}\text{C}_{\text{dolomite}} \text{‰ (PDB)}^4$	$\delta^{18}\text{O}_{\text{dolomite}} \text{‰ (PDB)}^4$	$\delta^{18}\text{O}_{\text{dolomite}} \text{‰ (SMOW)}^5$
	25.0	19.9	4.7						
			5.2						
insuff	12.6	26.0	7.3						
			6.3						
28.5	25.2	30.5	5.2						
			3.8						
	27.9	28.7	6.3						
41.7	34.6	32.2	6.0						
			4.7	9.3	-0.7	30.1	9.6	-0.1	30.8
insuff	40.3	41.9	4.9	11.1	0.1	31.0	11.8	0.3	31.2
insuff	insuff	40.4	8.4	8.8	-1.2	29.7	10.5	1.1	31.9
			2.9	7.2	-1.7	29.1	7.5	-0.9	29.9
insuff	31.8	26.9	4.4	5.0	-2.1	28.7	6.4	-1.7	29.1
insuff	41.9	20.9	4.2	4.5	-2.6	28.2	4.3	-0.6	30.2
insuff	40.2	40.4	8.0	4.9	-1.9	28.9	5.1	-1.4	29.4
insuff	30.0	29.2	6.4	7.0	-0.4	30.4	7.6	0.2	31.1
			8.6	6.3	-1.6	29.3	6.5	-0.4	30.4
insuff	22.3	16.2	2.7	5.4	-0.7	30.2	5.6	-0.4	30.4
32.1	31.9	28.7	2.2	6.4	-0.2	30.6	6.5	0.0	30.9
insuff	27.9	insuff	6.2	1.9	-2.0	28.8	2.4	0.0	30.8
26.8	26.2	24.5	4.3	1.4	-2.2	28.6	3.5	-0.4	30.4
insuff	insuff	19.4	5.3	2.9	0.1	30.9	3.0	0.1	31.0
			3.1	4.9	-2.0	28.8	6.5	-1.5	29.4
insuff	13.2	12.8	4.3	8.1	-0.7	30.2	10.1	0.9	31.8
			6.9	6.2	0.0	30.8	6.6	0.1	30.9
insuff	25.6	insuff	6.0	5.5	0.1	31.0	5.8	0.0	30.8
			7.5	3.8	-2.7	28.1	5.3	-0.2	30.6
insuff	17.2	insuff	3.6	1.8	-3.1	27.7	2.2	-2.2	28.6
insuff	11.4	10.7	4.1	1.1	-4.2	26.5	2.1	-2.0	28.8
			1.3	-2.4	-6.0	24.7	-0.5	-3.7	27.0
insuff	23.0	insuff	1.2	-2.1	-6.9	23.8	0.1	-3.3	27.5
			2.6	-0.3	-4.9	25.9	2.1	-2.0	28.8
insuff	7.3	insuff	3.4						
			1.9	-1.3	-6.2	24.5	-0.7	-4.6	26.1
insuff	10.9	11.0	2.1	-1.2	-8.2	22.5	-0.6	-5.3	25.4
			2.1	-2.7	-9.5	21.1	-1.1	-5.5	25.2
insuff	4.7	14.6	6.1	4.1	-4.6	26.1	3.6	-6.0	24.7
			2.4	-2.0	-8.5	22.1	-0.2	-3.9	26.9
insuff	27.8	20.6	7.5	5.4	-3.0	27.8	5.9	-3.2	27.6