TABLE 1. U Series Data for Calcite Precipitates, Wind Cave, S.D.

Sample No.	Type	Elevation above watertable (m)	U context (ppm)	$^{234}U:^{238}U$	$^{234}U:^{238}U_o$	$^{230}Th:^{234}U$	$^{230}Th:^{232}Th$	$^{230}Th:^{234}U$ age-ky (1 σ error)	$^{234}U:^{238}U$ age-ky (1 σ error)	Notes
BC22	W	83.0	0.96	1.628	2.12	0.924	218	204 ± 22		
BC24	W	79.0	0.67	1.562	-	1.112	13		314 ± 50	Age estimate at 2σ
BC25	W	79.0	0.82	1.460	-	1.064	34		337 ± 59	Age estimate at 1σ
BC26b	W	71.0	1.21	1.498	1.884	0.916	345	205 ± 12		
BC26m	W	71.0	0.91	1.591	2.294	1.03	21	$283 \pm^{46}_{34}$		
BC27	W	69.0	1.59	1.544	2.123	0.998	43	$259 \pm^{30}_{24}$		
BC28t	W	68.0	3.14	1.242	1.609	1.012	44	$328 \pm^{76}_{58}$		
BC28w	W	68.0	3.10	1.129	1.324	0.987	60	$330 \pm^{99}_{69}$		
BC29	W	67.0	1.26	1.266	-	1.047	38		464 ± 69	Age estimate at $\bar{x}$. Incorporated silica growth may distort.
BC30t	W	60.0	2.95	1.556	1.965	0.905	100	196 ± 16		
BC30w	W	60.0	2.26	1.555	1.996	0.927	222	209 ± 19		
BC31t	W	55.5	2.71	1.583	2.018	0.911	44	$198 \pm^{17}_{15}$		
BC31w	W	55.5	2.44	1.5	1.938	0.948	158	$224 \pm^{21}_{18}$		
BC32	W	54.0	2.44	1.538	1.943	0.911	155	200 ± 16		

(W = subaqueous wall crust. R = calcite raft. S = waterline shelfstone. E = evaporite. H = helictite; subaqueous bush growth.)

BC32R	W	54.0	2.40	1.551	3.126	0.99	24	$259 \pm^{30}_{25}$		
BC33	R	54.0	2.10	1.593	1.930	0.828	156	$160 \pm^{17}_{15}$		
BC33At	W	55.0	2.77	1.596	1.992	0.878	219	$181 \pm^{14}_{12}$		
BC33Ab	W	55.0	2.69	1.578	2.114	0.969	53	$234 \pm^{18}_{16}$		
BC33Aw	W	55.0	2.94	1.574	2.007	0.914	68	$200 \pm^{13}_{12}$		
BC36	W	51.0	2.43	1.596	-	1.345	104		303 ± 50	Age estimate at 2σ
BC37	W	52.0	2.59	1.61	2.176	0.972	285	$234 \pm^{26}_{22}$		
BC37t	E	52.0	4.38	1.654	1.915	0.708	336	120 ± 6		
BC41	W	50.5	3.37	1.656	2.163	0.927	237	$204 \pm^{13}_{12}$		
BC42	W	54.5	1.47	1.655	2.075	0.872	73	$177 \pm^{18}_{16}$		
BC47	W	50.0	2.70	1.602	1.996	0.874	48	$180 \pm^{18}_{16}$		
BC50	W	52.0	1.77	1.528	1.948	0.924	62	$208 \pm^{7}_{5}$		
BC51	W	52.0	2.06	1.511	2.055	0.994	73	$258 \pm^{23}_{19}$		
BC58	W	40.0	3.04	1.618	2.012	0.867	105	$176 \pm^{14}_{12}$		
BC59	S	38.5	1.83	1.787	2.125	0.74	131	127 ± 8		
BC60	S	34.0	3.11	1.735	2.099	0.789	355	144 ± 7		
BC65	W	29.0	2.04	1.558	1.93	0.877	121	$182 \pm^{13}_{12}$		
BC66	W	28.0	5.28	1.815	2.111	0.679	223	$110 \pm^{4}_{3}$		
BC69	W	18.0	1.48	1.631	2.011	0.85	49	$168 \pm^{8}_{7}$		
BC71	W	5.0	1.48	1.623	1.809	0.604	63			

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BC73	W	18.0	1.98	1.324	1.515	0.837	14	165±14		
BC74	R	0.0	1.11	1.739	1.749	0.048	9	5.3±0.6		
76WC1	W	50.0	3.57	1.568	-	1.099	33		320±50	Age estimate at 2σ
82WC7	W	60.0	2.17	1.587	2.157	0.982	540	242±16		
82WC9	S	66.0	3.17	1.580	2.035	0.923	134	205±14		
82WC5	R	65.0	3.58	1.663	2.114	0.890	60	185±12		
82WC6	S	60.0	7.86	1.122	1.189	0.775	110	154±2		
82WC10	W	35.0	2.67	1.670	2.284	0.974	316	230±20		
82WC12	S	30.0	0.53	1.538	1.665	0.571	7	76±5		
82WC20	W	25.0	2.62	1.585	2.101	0.957	210	225±15		
82WC14	W	15.0	1.71	1.736	2.421	0.984	47	234±20		
82WC19	W	10.0	1.51	1.514	1.922	0.931	24	208±23		
82WC18	W	10.0	1.14	1.459	1.706	0.802	350	153±18		
87LC2	W	0.6	0.46	1.86	1.994	0.409	18	55±5		
87LC3	W	1.2	0.50	1.667	1.926	0.699	29	117±6		
87LC4	W	2.0	0.72	1.399	1.678	0.877	30	189±10		
87LC5	W	3.2	0.90	1.597	1.806	0.661	46	107±5		
87LC5R	W	3.2	0.80	1.586	1.801	0.676	39	111±6		
87LC6b	W	5.5	0.82	1.521	1.597	0.427	7	58±3		
87LC7R	R	6.5	1.51	1.022	1.022	0.021	9	2.3±0.2		

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87LC8	W	11.0	0.79	1.516	1.951	0.939	103	218±34		
87LC10A	W	6.7	0.96	1.611	1.916	0.786	122	145±7		
87LC10B	W	6.7	1.04	1.618	1.920	0.780	202	142±12		
87LC23	R	7.0	1.04	1.783	1.785	0.011	6	1.2±0.3		
87LC23R	R	7.0	1.25	1.765	1.771	0.028	11	3.1±0.2		
87LC32	R	9.8	1.55	1.755	1.773	0.096	6	11±0.5		
87LC37	R	11.3	1.01	1.761	1.767	0.030	17	3.3±0.2		
87UC1	W	87.0	0.94	1.448	-	1.318	71		347±58	Age estimate at 1σ
87UC2R	S	67.0	0.94	1.518	2.111	1.009	30	272±41		
87UC3A	S	80.0	0.58	1.448	1.869	0.959	28	236±28		
87UC3AF	W	80.5	0.56	1.318	1.567	0.900	39	206±28		
87UC3B	W	80.0	0.96	1.535	2.172	1.020	26	280±40		
87UC3X	W	81	0.80	1.497	-	1.125	95		309±59	Age estimate at 1σ
87UC5A	E	91.0	0.69	1.046	1.077	0.831	25	188±17		
87UC5B	W	91.0	0.33	1.287	-	1.067	34		457±49	Age estimate at $\bar{x}$
87UC5	W	92.0	0.19	1.306	1.687	1.003	13	300±95		
88MAX	H	20.0	1.44	1.646	2.131	0.918	30	200±19		
88UC6	W	89.0	0.28	1.263	-	1.133	87		488±49	Age estimate at $\bar{x}$
87MAJ2	W	53.0	4.11	1.671	2.107	0.872	134	177±4		

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87MAJ1	W	53.0	4.28	1.660	2.073	0.859	128	171±2		
87MAJk	W	53.0	4.27	1.456	2.101	1.037	370	311±6		
87MAJj	W	52.0	4.48	1.468	2.054	1.019	370	287±9		
87MAJh	W	53.0	4.23	1.594	2.059	0.969	370	236±2		
87MAJg	W	53.0	3.97	1.594	2.122	0.958	370	225±2		
87MAJf	W	53.0	3.34	1.641	2.160	0.934	200	208±2.5		
87MAJe	W	53.0	4.14	1.653	2.077	0.871	139	177±1		
87MAJb	W	53.0	4.21	1.681	2.080	0.840	319	163±2		
87MAJa	W	53.0	4.30	1.662	1.959	0.747	220	131±1.5		
87MAJ5	W	53.0	4.53	1.459	2.019	1.018	334	289±15		
87MAJ4	W	53.0	4.24	1.554	2.071	0.965	52	282±9		
87MAJ3	W	53.0	3.70	1.642	2.115	0.909	118	195±3.5		
87MAJ2	W	53.0	4.11	1.671	2.107	0.872	134	177±4		
87MAJ2	W	53.0	4.28	1.660	2.073	0.859	128	171±2		

(W = subaqueous wall crust. R = calcite raft. S = waterline shelfstone. E = evaporite. H = helictite; subaqueous bush growth.)