

**Supplemental Item S7 - New igneous bedrock <sup>40</sup>Ar/<sup>39</sup>Ar fusion ages from the Wrangell Arc, Wrangell-St. Elias Mountains, Alaska**

Weighted average of J from standards = 1.185e-04 +/- 5.157e-07

Sample	Phase dated	UTM Easting or Latitude N (deg)	UTM Northing or Longitude W (deg)	Location	Rock type	40Ar/39Ar meas.	+/-	37Ar/39Ar meas.	+/-	36Ar/39Ar meas.	+/-	% Atm. 40Ar	+/-	Ca/K	+/-	Cl/K	+/-	40*/39K	+/-	Age (Ma)	+/- (Ma)	Volts	# Grains
SB-01	WR	07 v 0400535	6875995	Green Hills area	Porphyritic lava	124.77333	1.13648	1.77431	0.02085	0.33306	0.00408	78.77962	0.74646	3.25971	0.03835	0.00293	0.0005	26.50429	0.9931	5.65	0.21	1.22019	2
SB-02	WR	07 v 0400507	6875885	Green Hills area	Porphyritic lava	141.16226	0.89336	1.24033	0.01451	0.38696	0.00915	80.94878	1.85739	2.27783	0.02668	0.00198	0.00069	26.91106	2.63272	5.74	0.56	0.69077	2
SB15-03	WR	07 v 0399991	6875469	Green Hills area	Lava	183.66915	1.41128	5.4602	0.0504	0.5097	0.01296	81.77166	2.00547	10.0575	0.0932	0.00448	0.00123	33.60402	3.7136	7.16	0.79	0.48904	2
SB15-04	WR	07 v 0400225	6873390	Green Hills area	Andesite lava	46.43677	0.35172	1.5596	0.01414	0.06839	0.00173	43.27211	1.0562	2.86481	0.026	0.00257	0.00026	26.3548	0.5334	5.62	0.11	0.55526	2
SB15-05	WR	07 v 0400234	6873378	Green Hills area	Basalt/andesite lava	68.35331	0.7198	2.16305	0.03177	0.14488	0.00434	62.39959	1.7739	3.97497	0.05848	0.00244	0.00054	25.72928	1.25043	5.49	0.27	0.38123	2
SB15-06	WR	07 v 0400068	6872705	Green Hills area	Felsic lava	33.05152	0.18782	0.61171	0.00648	0.0299	0.00131	26.60016	1.16877	1.12289	0.01189	0.00227	0.00024	24.24845	0.41391	5.17	0.09	0.61921	2
SB15-07	WR	07 v 0399943	6872537	Green Hills area	Basalt/andesite lava	563.33889	3.61124	1.59257	0.01325	1.78704	0.02175	93.72117	0.97357	9.25243	0.02436	0.01189	0.00095	35.40906	5.49647	7.55	1.17	6.39181	2
SB15-08	WR	07 v 0400010	6872294	Green Hills area	Felsic pryclastic	50.0922	0.48808	4.36152	0.05318	0.0993	0.00493	57.89471	2.86341	8.02751	0.09818	0.00094	0.00059	21.14412	1.45577	4.51	0.31	0.23075	4
SB15-09	WR	07 v 0400146	6872026	Green Hills area	Basalt/andesite lava	26.97636	0.21154	0.53544	0.00748	0.0186	0.00201	20.23135	2.19471	0.98282	0.01373	0.00198	0.00017	21.50313	0.61568	4.59	0.13	0.22447	2
SB15-10	WR	07 v 0400263	6871822	Green Hills area	Basalt/andesite lava	62.13946	0.48693	1.52232	0.0173	0.13581	0.00368	64.4101	1.68576	2.79625	0.03182	0.00761	0.00038	22.1286	1.06613	4.72	0.23	0.46776	1
SB15-11	WR	07 v 0400315	6871765	Green Hills area	Basalt/andesite lava	94.85685	0.64362	4.3451	0.04078	0.24513	0.0051	76.00798	1.51015	7.99721	0.07528	0.00509	0.00039	22.821	1.447	4.87	0.31	0.76361	2
SB15-12	WR	07 v 0400356	6871732	Green Hills area	Andesite/dacite lava	89.20962	0.47418	1.67031	0.01745	0.22389	0.00508	74.03317	1.64662	3.06841	0.03209	0.00592	0.00046	23.18456	1.47811	4.94	0.31	0.72563	2
SB15-14	WR	07 v 0400396	6876250	Green Hills area	Andesite lava	33.68459	0.25784	0.82222	0.00907	0.03246	0.00125	28.2959	1.08023	1.50953	0.01666	0.00316	0.00024	24.14597	0.41094	5.15	0.09	0.35907	2

Weighted average of J from standards = 1.097e-04 +/- 4.804e-07

Sample name		UTM Easting or Latitude N (deg)	UTM Northing or Longitude W (deg)			40Ar/39Ar meas.	+/-	37Ar/39Ar meas.	+/-	36Ar/39Ar meas.	+/-	% Atm. 40Ar	+/-	Ca/K	+/-	Cl/K	+/-	40*/39K	+/-	Age (Ma)	+/- (Ma)	Volts	# Grains
SB-45	WR	07 v 0492754	6858664	Cabin Creek area	Rhyolite plug	105.08924	0.47711	0.29121	0.00447	0.00539	0.00119	1.49384	0.33589	0.53444	0.0082	0.00654	0.0002	103.51141	0.58885	20.34	0.12	1.79464	1
SB-57	WR	07 v 0403822	6876252	Euchre Mountain	Basalt/andesite lava	37.38511	0.30713	1.49321	0.0186	0.10241	0.0035	80.67976	2.70686	2.74272	0.0342	0.01344	0.00068	7.22478	1.01559	1.43	0.2	0.22764	2
SB-58	WR	07 v 0437780	6880770	Euchre Mountain	Basalt/andesite lava	10.75998	0.09356	1.72545	0.02515	0.0057	0.00278	14.36995	7.66163	3.16982	0.04627	0.01608	0.00068	9.19959	0.82757	1.82	0.16	0.04352	2
SB-59	WR	07 v 0437716	6880729	Euchre Mountain	Dacite lava	14.45586	0.07451	1.61088	0.01464	0.01491	0.00149	29.61598	3.04673	2.95912	0.02691	0.00511	0.00033	10.1653	0.44378	2.01	0.09	0.16205	2
SB-60	WR	07 v 0437711	6990630	Euchre Mountain	Basalt/andesite lava	74.16088	0.37732	1.99416	0.0189	0.21844	0.00351	86.85098	1.34516	3.66417	0.03477	0.02518	0.00055	9.76128	1.00176	1.93	0.2	0.81188	2
SB-61	WR	07 v 0437705	6880606	Euchre Mountain	Dacite lava	28.11437	0.14811	2.43937	0.01703	0.06328	0.00166	65.86469	1.73202	4.48364	0.03135	0.02005	0.00054	9.60335	0.49215	1.9	0.1	0.27584	2
SB-62	WR	07 v 0437761	6880563	Euchre Mountain	Dacite lava	22.80175	0.1843	3.17736	0.04982	0.05035	0.0034	64.18637	4.39908	5.84313	0.09182	0.00818	0.00092	8.17386	1.00789	1.61	0.2	0.10366	2
SB-63	WR	07 v 0437682	6880522	Euchre Mountain	Andesite lava	75.52482	0.54494	4.78952	0.04363	0.22868	0.00979	88.98703	3.77844	8.81794	0.0806	0.02594	0.00104	8.34248	2.86317	1.65	0.57	0.29426	2
SB-64	WR	07 v 0437463	6880468	Euchre Mountain	Andesite lava	119.18283	1.63214	4.28113	0.07406	0.37905	0.01224	93.70753	2.76165	7.87911	0.13671	0.01787	0.00101	7.52042	3.30328	1.49	0.65	0.31275	2

Weighted average of J from standards = 1.121e-04 +/- 6.859e-07

Sample		UTM Easting or Latitude N (deg)	UTM Northing or Longitude W (deg)			40Ar/39Ar meas.	+/-	37Ar/39Ar meas.	+/-	36Ar/39Ar meas.	+/-	% Atm. 40Ar	+/-	Ca/K	+/-	Cl/K	+/-	40*/39K	+/-	Age (Ma)	+/- (Ma)	Volts	# Grains
SB-65	WR	07 v 0436908	6880054	Euchre Mountain	Andesite lava	55.22326	0.89913	5.66397	0.10914	0.15518	0.00734	82.23546	3.70665	10.43434	0.20188	0.01281	0.00107	9.84428	2.06222	1.99	0.42	0.15352	1
SB-66	WR	07 v 0382099	6910524	Pass Creek	Basalt lava	123.43972	1.02918	2.88864	0.03391	0.36057	0.00918	86.14397	2.08949	5.31109	0.06248	0.00673	0.00063	17.13469	2.59043	3.46	0.52	0.537	1

Weighted average of J from standards = 1.028e-04 +/- 5.880e-07

Sample name		UTM Easting or Latitude N (deg)	UTM Northing or Longitude W (deg)			40Ar/39Ar meas.	+/-	37Ar/39Ar meas.	+/-	36Ar/39Ar meas.	+/-	% Atm. 40Ar	+/-	Ca/K	+/-	Cl/K	+/-	40*/39K	+/-	Age (Ma)	+/- (Ma)	Volts	# Grains
15JB011A	WR	62.01565	142.892	Green Hills area	Basalt/andesite dike	113.46105	0.81008	2.29184	0.04026	0.2805	0.0086	72.90646	2.18348	4.21203	0.0741	0.00227	0.00073	30.78241	2.49285	5.7	0.46	0.50061	1
15JB021A	WR	62.01565	142.892	Green Hills area	Hypabyssal intrusion	117.35532	1.1765	0.42096	0.01607	0.29499	0.00858	74.26733	0.29369	0.77264	0.02951	0.00421	0.00138	30.2	2.41772	5.59	0.45	0.44559	1
15JB051A	WR	62.23203	142.974	Monte Cristo Creek	Hypabyssal intrusion	183.87788	1.35266	6.56171	0.06961	0.27798	0.01015	44.38623	1.60246	12.09589	0.12893	0.00678	0.00127	102.72099	3.06437	18.94	0.56	0.62484	1
15JB091A	WR	62.11008	142.4666	Cross Creek area	Hypabyssal intrusion	166.77422	0.88561	0.80448	0.00728	0.14907	0.00198	26.37784	0.32478	1.47696	0.01338	0.001494	0.00043	122.83072	0.85768	22.62	0.16	2.45314	1
15JB121A	WR	62.48293	143.098798	Nabesna area	Basalt/andesite lava	612.24815	6.09144	3.80331	0.06198	1.94204	0.0361	93.68527	1.48321	6.99735	0.11433	0.00619	0.00329	38.76406	9.11783	7.17	1.68	0.9661	1
15JB251A	WR	61.87848	141.0013	Rocker Creek area	Basalt/andesite lava	1776.79713	21.46266	6.271	0.08629	4.85416	0.06563	80.7021	0.49299	11.55762	0.15975	0.02986	0.00231	344.40402	9.75002	62.72	1.75	10.92289	1
15JB281A	WR	61.87213	141.0259	Rocker Creek area	Basalt/andesite lava	148.60255	0.94232	0.22925	0.00545	0.07694	0.00203	15.28969	0.39226	4.4207	0.01001	0.00447	0.00042	125.8769	0.99239	23.18	0.18	1.90485	1
15JB341A	WR	61.88716	141.022	Rocker Creek area	Rhyolite dome	272.15837	2.53092	1.02355	0.01409	0.43251	0.00868	46.93436	0.83907	1.87943	0.02589	0.00279	0.0012	144.51128	2.66314	26.58	0.49	2.00045	1
15JB381A	WR	61.8816	140.9876	Rocker Creek area	Rhyolite lava	128.55037	0.43864	0.06109	0.00183	0.00741	0.0005	1.70062	0.11474	0.11209	0.00336	0.00038	0.00016	126.34048	4.55886	23.26	0.08	4.78694	1
15JB391A	WR	61.87183	141.0331	Rocker Creek area	Basalt/andesite lava	153.14689	0.88566	0.926	0.01074	0.09293	0.00258	17.8855	0.4885	1.7002	0.01973	0.00112	0.00058	125.81372	1.04831	23.17	0.19	1.41786	1

Weighted average of J from standards = 1.0173e-04 +/- 5.880e-07

Sample name		UTM Easting or Latitude N (deg)	UTM Northing or Longitude W (deg)			40Ar/39Ar meas.	+/-	37Ar/39Ar meas.	+/-	36Ar/39Ar meas.	+/-	% Atm. 40Ar	+/-	Ca/K	+/-	Cl/K	+/-	40*/39K	+/-	Age (Ma)	+/- (Ma)	Volts	# Grains
15JB441A	WR	61.88728	141.0333	Rocker Creek area	Rhyolite lava	706.68555	18.72061	9.89719	0.2807	0.17689	0.01674	7.28137	0.6724	18.28781	0.52232	0.069	0.00381	65.81361	18.2471	117.07	3.13	0.31225	1
15JB501A	WR	62.04721	142.2343	Euchre Mountain	Basalt/andesite lava	102.70033	1.03333	7.12821	0.10196	0.3014	0.01	86.17329	2.75332	13.14547	0.18898	0.00254	0.00217	14.26781	2.8465	2.61	0.52	0.0367	1
15JB511A-RHYOLITE	WR	62.04752	142.2366	Euchre Mountain	Rhyolite lava	12.61568	0.09355	0.97598	0.01403	0.00438	0.00275	9.64109	6.44624	1.79202	0.02578	0.00335	0.00088	11.38042	0.81642	2.09	0.15	0.15878	1
15JB521A	WR	62.04952	142.2421	Euchre Mountain	Rhyolite lava	13.36749	0.09187	1.1819	0.01168	0.00578	0.00244	12.08486	5.39434	2.17044	0.02146	0.00326	0.00027	11.73575	0.7247	2.15	0.13	1.08642	1
15JB551A	HO	62.00842	142.3194	Euchre Mountain	Hypabyssal intrusion	234.55041	6.87045	12.42681	0.38044	0.25806	0.02709	32.07968	3.27935	23.00336	0.71047	0.2693	0.01081	160.69767	9.10404	29.22	1.64	0.38786	3
Short	HO	07 v 0401138	6905326	Bond Creek area	Hypabyssal intrusion	266.88243	4.67346	17.33722	0.31806	0.54878	0.02067	60.23401	2.02912	32.20573	0.59815	0.15752	0.00389	107.43215	5.80766	19.59	1.05	0.60527	3
Bond Fine	HO	N62°16'26.1"	W142°51'21.3"	Bond Creek area	Hypabyssal intrusion	174.7878	2.0338	12.1433	0.16773	0.28512	0.01111	47.63816	1.29065	22.47402	0.31311	0.21034	0.00343	92.92823	3.57512	16.84	0.61	0.24382	4

Sample name		UTM Easting or Latitude N (deg)	UTM Northing or Longitude W (deg)			40Ar/39Ar meas.	+/-	37Ar/39Ar meas.	+/-	36Ar/39Ar meas.	+/-	% Atm. 40Ar	+/-	Ca/K	+/-	Cl/K	+/-	40*/39K +/-	Age (Ma)	+/- (Ma)	Volts	# Grains	
15JB20LATUFF	BI	61.90856	141.0505	Rocker Creek area	Rhyolite tuff	158.38014	0.40074	-0.00322	0.00245	0.01197	0.00086	2.23436	0.16115	-0.00591	0.0045	0.00569	0.0002	154.81196	0.46779	27.86	0.08	4.98111	1
15JB09LA	HO	62.11008	142.4666	Cross Creek area	Hypabyssal intrusion	214.88561	2.78416	14.21231	0.20004	0.26937	0.00852	36.50186	1.07305	26.34202	0.37453	0.22271	0.00401	137.8129	2.95933	24.82	0.53	0.62825	1

Weighted average of J from standards = 1.347e-04 +/- 2.749e-06

Sample name		UTM Easting or Latitude N (deg)	UTM Northing or Longitude W (deg)			40Ar/39Ar meas.	+/-	37Ar/39Ar meas.	+/-	36Ar/39Ar meas.	+/-	% Atm. 40Ar	+/-	Ca/K	+/-	Cl/K	+/-	40*/39K +/-	Age (Ma)	+/- (Ma)	Volts	# Grains	
67LA	BI	61.9852	141.8087	Beaver Lake area	Lava	112.97817	1.4044	0.02663	0.00748	0.03956	0.00223	10.3468	0.56981	0.04886	0.01372	0.00936	0.00106	101.26382	1.41893	24.41	0.34	0.84004	1
122LA	WR	61.4608	141.15393	Klutlan Glacier area	Lava	56.76085	0.44105	0.14776	0.00647	0.06873	0.00236	35.78048	1.20354	0.27114	0.01187	0.00052	0.00051	36.43628	0.74583	8.82	0.18	0.69001	1
123LA-B	WR	61.4869	141.22655	Klutlan Glacier area	Lava	51.81863	0.84059	0.37533	0.01587	0.04499	0.00339	25.61129	1.89304	0.68887	0.02913	0.0014	0.00096	38.53534	1.16501	9.33	0.28	0.27676	1
123LA-C	WR	61.4869	141.22655	Klutlan Glacier area	Lava	591.02204	1.67358	0.03607	0.00179	0.03106	0.00098	1.55258	0.04896	0.06618	0.00328	0.00033	0.0002	581.83156	1.67543	135.97	0.38	21.48054	1

Weighted average of J from standards = 1.241e-04 +/- 1.137e-06

Sample name		UTM Easting or	UTM Northing or			40Ar/39Ar	+/-	37Ar/39Ar	+/-	36Ar/39Ar	+/-	% Atm.	+/-	Ca/K	+/-	Cl/K	+/-	40*/39K	+/-	Age	+/-	Volts	# Grains
		Latitude N (deg)	Longitude W (deg)			meas.	meas.	meas.	40Ar	40Ar	40Ar	40Ar	40Ar	40Ar	40Ar	40Ar	40Ar	40Ar	40Ar	(Ma)	(Ma)		
MB16-13	WR	07 v 0456226	6848156	Solo Creek area	Flow below tillites	263.10058	11.584	3.64613	0.16567	0.62004	0.02987	69.53325	1.36622	6.70741	0.30555	0.01306	0.00357	80.35608	5.06016	17.88	1.12	0.62664	1
MB16-15	WR	07 v 0458226	6848847	Solo Creek area	Basalt/andesite lava	108.12276	4.05274	7.11171	0.27149	0.28703	0.01443	77.92462	2.64435	13.11487	0.50318	0.00938	0.00247	23.98244	3.01612	5.36	0.67	0.26636	1
MB16-18	WR	07 v 0458195	6848629	Solo Creek area	Basalt/andesite lava	78.32108	1.6842	4.18059	0.0918	0.13449	0.00667	50.32264	2.27135	7.69352	0.16943	0.00354	0.00167	39.0083	1.97567	8.7	0.44	0.3661	1
070416G	WR	62.01361	141.92137			565.8527	11.17283	5.97815	0.12097	0.04732	0.00782	2.38411	0.40559	11.01558	0.22384	0.01758	0.00242	554.67504	11.24181	119.97	2.35	2.09644	1

Weighted average of J from standards = 1.338e-04 +/- 1.605e-06

Sample name		UTM Easting or Latitude N (deg)	UTM Northing or Longitude W (deg)			40Ar/39Ar meas.	+/-	37Ar/39Ar meas.	+/-	36Ar/39Ar meas.	+/-	% Atm. 40Ar	+/-	Ca/K	+/-	Cl/K	+/-	40*/39K +/-	Age (Ma)	+/- (Ma)	Volts	# Grains	
32LA	PL	61.88054	141.03178	Rocker Creek area	Basalt/andesite lava	101.68559	6.91491	6.49325	0.44795	0.0309	0.02397	8.45428	6.94187	11.96911	0.82952	0.01694	0.00658	93.49046	9.54462	22.4	2.27	0.12829	1
46LA	WR	61.8568	141.07463	Rocker Creek area	Basalt/andesite lava	289.24587	7.46373	3.76077	0.10101	0.62961	0.01917	64.22212	1.05882	6.91887	0.18632	0.02526	0.00273	103.75099	4.10283	24.84	0.98	0.82457	1
49LA	WR	61.89246	141.01753	Rocker Creek area	Rhyolite lava	164.58776	2.09313	0.18531	0.01117	0.04579	0.00368	8.21387	0.6524	0.34006	0.0205	0.00267	0.00105	151.06125	2.20817	36.05	0.52	1.12262	1
53LA	WR	62.05035	142.24463	Euchre Mountain	Rhyolite tuff/flow	23.56587	0.3336	2.88418	0.04399	0.05445	0.00357	67.3564	4.38112	5.30288	0.08105	0.01373	0.00121	7.69875	1.03976	1.85	0.25	0.13742	1

**Notes:**

Phase dated abbreviation: BI-biotite, HO-hornblende, PL-plagioclase, WR-whole rock

Rock types are field-based descriptions prior to geochemical analyses reported in Brueseke et al. (2019) and Berkelhammer et al. (2019).