TABLE 3. Average major element compositions of tourmalines from the Heemskirk and Pieman Heads granites, analyzed by EMPA

Locati	Trial Harbor, Heemskirk								Granville Harbor,				Pieman Heads Granite					
Featur	Patch		Orbicule		Cavity		Vein		Orbicule		Cavity		Patch		Orbicule		Vein	
	Av	S	Av.	SD	Av	S	Av.	S	Av.	SD	Av.	S	Av.	S	Av.	SD	Av	S
SiO_2	33.	0.	32.	0.5	33.	0.	33.	0.	33.	0.5	33.	0.	34.	0.	34.	0.4	33.	0.
TiO_2	0.5	0.	0.2	0.1	0.3	0.	0.2	0.	0.4	0.1	0.4	0.	0.4	0.	0.5	0.2	0.3	0.
Al_2O_3	33.	0.	34.	0.7	33.	0.	33.	1.	34.	1.2	34.	1.	35.	0.	34.	0.7	35.	1.
FeO	14.	0.	15.	0.5	15.	0.	16.	0.	13.	0.4	14.	0.	11.	1.	11.	0.7	12.	1.
MgO	1.2	0.	0.5	0.1	0.6	0.	0.2	0.	1.2	0.3	1.0	0.	2.4	1.	2.7	0.3	1.4	1.
CaO	0.1	0.	0.1	0.0	0.1	0.	0.0	0.	0.2	0.0	0.1	0.	0.2	0.	0.2	0.0	0.1	0.
MnO	0.1	0.	0.1	0.0	0.0	0.	0.1	0.	0.1	0.0	0.1	0.	0.0	0.	0.0	0.0	0.3	0.
Na_2O	1.9	0.	1.9	0.1	1.8	0.	1.9	0.	1.9	0.1	1.8	0.	1.7	0.	1.7	0.1	1.6	0.
K_2O	0.0	0.	0.0	0.0	0.0	0.	0.0	0.	0.0	0.0	0.0	0.	0.0	0.	0.0	0.0	0.0	0.
F	1.0	0.	0.9	0.1	0.8	0.	0.7	0.	0.9	0.1	1.0	0.	0.5	0.	0.5	0.1	0.6	0.
*H_2O	2.9	0.	3.0	0.0	3.0	0.	3.1	0.	3.0	0.0	3.0	0.	3.3	0.	3.3	0.1	3.2	0.
*B_2O_3	10.	0.	10.	0.0	10.	0.	10.	0.	10.	0.0	10.	0.	10.	0.	10.	0.0	10.	0.
Total	99.	0.	99.	0.5	99.	0.	100	0.	100	0.5	100	0.	100	0.	99.	0.7	99.	0.
Si (T)	5.6	0.	5.6	0.0	5.7	0.	5.7	0.	5.6	0.0	5.7	0.	5.7	0.	5.7	0.0	5.6	0.
Al (T)	0.3	0.	0.3	0.0	0.2	0.	0.2	0.	0.3	0.0	0.2	0.	0.2	0.	0.2	0.0	0.3	0.
Al (Z)	6.0	0.	6.0	0.0	6.0	0.	6.0	0.	6.0	0.0	6.0	0.	6.0	0.	6.0	0.0	6.0	0.
Al (Y)	0.4	0.	0.6	0.1	0.5	0.	0.5	0.	0.6	0.1	0.5	0.	0.6	0.	0.5	0.1	0.7	0.
Ti (Y)	0.0	0.	0.0	0.0	0.0	0.	0.0	0.	0.0	0.0	0.0	0.	0.0	0.	0.0	0.0	0.0	0.
Mg	0.3	0.	0.1	0.0	0.1	0.	0.0	0.	0.3	0.0	0.2	0.	0.6	0.	0.6	0.0	0.3	0.
Mn	0.0	0.	0.0	0.0	0.0	0.	0.0	0.	0.0	0.0	0.0	0.	0.0	0.	0.0	0.0	0.0	0.
Fe (Y)	2.1	0.	2.1	0.0	2.2	0.	2.3	0.	1.9	0.0	2.1	0.	1.6	0.	1.6	0.1	1.7	0.
Ca	0.0	0.	0.0	0.0	0.0	0.	0.0	0.	0.0	0.0	0.0	0.	0.0	0.	0.0	0.0	0.0	0.
Na	0.6	0.	0.6	0.0	0.6	0.	0.6	0.	0.6	0.0	0.6	0.	0.5	0.	0.5	0.0	0.5	0.
K (X)	0.0	0.	0.0	0.0	0.0	0.	0.0	0.	0.0	0.0	0.0	0.	0.0	0.	0.0	0.0	0.0	0.
vac.(	0.2	0.	0.3	0.0	0.3	0.	0.3	0.	0.3	0.0	0.3	0.	0.4	0.	0.3	0.0	0.4	0.
F (W)	0.5	0.	0.5	0.1	0.4	0.	0.4	0.	0.5	0.0	0.5	0.	0.3	0.	0.2	0.1	0.3	0.
OH	3.4	0.	3.4	0.1	3.5	0.	3.5	0.	3.4	0.0	3.4	0.	3.6	0.	3.7	0.1	3.6	0.
B	3.0	0.	3.0	0.0	3.0	0.	3.0	0.	3.0	0.0	3.0	0.	3.0	0.	3.0	0.0	3.0	0.

* H_2O and * B_2O_3 calculated by stoichiometry; §apfu, tourmaline structure formulae calculations based on 31 anions including 15 cations at T, Z, and Y sites (Henry and Dutrow, 1996). Abbreviations: Av. = average, SD = standard deviation.

TABLE 5. Summary of trace element compositions of tourmalines from the Heemskirk and Pieman Heads granites, analyzed by LA-ICP-MS

	Heemskirk Batholith			Heemskirk Batholith			Pieman Heads Granite (n=50)		
	Trial Harbor (n=63)			Granville Harbor (n=19)					
Elements	Range	Median	% bdl	Range	Median	% bdl	Range	Median	% bdl
Li	22.82 - 262.3	119.8	0	74.64 - 154.3	131.4	0	18.80 - 968.4	79.83	0
Be	1.79 - 64.51	9.36	2	3.46 - 62.09	9.71	0	0.89 - 22.32	3.69	24
P	40.69 - 512.1	81.49	25	41.37 - 284.7	73.11	26	48.15 - 189.1	81.59	22
Sc	1.22 - 118.6	45.61	0	5.10 - 83.10	23.63	0	0.84 - 109.9	49.92	0
V	0.49 - 62.97	10.73	3	2.42 - 78.04	32.49	0	0.24 - 180.6	60.51	4
Cr	0.23 - 19.29	7.9	60	2.59 - 74.28	20.75	5	1.05 - 40.65	6.4	60
Co	1.35 - 14.73	10.05	0	10.11 - 22.39	20.33	0	2.21 - 31.33	26.61	0
Ni	0.23 - 6.54	1.41	33	2.01 - 9.69	6.08	5	0.28 - 14.86	10.1	20
Cu	0.84 - 10.31	2.44	59	1.23 - 9.86	2.02	58	0.71 - 8.80	1.55	82
Zn	61.57 - 260.2	208.1	0	189.5 - 271.8	211.0	0	166.6 - 430.0	206.9	0
Ga	46.34 - 282.6	187.9	0	138.5 - 219.0	181.3	0	69.20 - 792.8	136.3	0
As	0.30 - 10.59	2.47	56	0.30 - 1.22	0.65	68	0.34 - 3.03	0.82	76
Rb	0.04 - 13.64	0.5	51	0.08 - 0.37	0.12	68	0.10 - 0.72	0.13	86
Sr	0.06 - 9.12	1.2	0	1.47 - 6.03	3.92	0	0.15 - 18.20	5.57	2
Y	0.01 - 8.77	0.08	27	0.02 - 0.14	0.05	47	0.01 - 0.54	0.06	42
Zr	0.12 - 6.64	0.39	5	0.03 - 1.51	0.33	21	0.02 - 3.46	0.28	24
Nb	0.86 - 70.38	5.67	0	1.17 - 27.52	1.82	0	0.20 - 5.16	1.6	0
^{95}Mo	0.08 - 1.71	0.42	57	0.09	0.09	95	0.07 - 0.44	0.16	90
^{98}Mo	0.06 - 1.34	0.32	54	0.04 - 0.12	0.08	89	0.09 - 0.31	0.24	92
Ag	0.06 - 0.09	0.07	87	0.08	0.08	95	0.03 - 0.06	0.05	96
Cd	0.21 - 4.60	0.44	87	0.19 - 0.30	0.25	89	0.13 - 0.45	0.19	86
Sn	19.33 - 289.2	44.8	0	3.42 - 35.29	4.97	0	3.50 - 98.18	13.65	0
Sb	0.10 - 1.09	0.17	81	0.19	0.19	95	0.07 - 0.19	0.16	92
Cs	0.01 - 19.38	0.16	37	0.02 - 0.26	0.05	53	0.01 - 0.69	0.11	64
Ba	0.04 - 0.80	0.1	56	0.09 - 0.24	0.13	63	0.05 - 0.75	0.16	52
La	0.13 - 11.60	2.34	0	0.48 - 3.39	2.12	0	0.04 - 6.48	0.93	6
Ce	0.29 - 25.35	4.2	0	0.87 - 6.23	3.98	0	0.07 - 8.83	1.68	6
Pr	0.03 - 3.36	0.39	3	0.08 - 0.59	0.32	0	0.01 - 0.78	0.17	16
Nd	0.13 - 9.78	1.23	10	0.19 - 1.52	0.79	0	0.03 - 1.97	0.52	28
Sm	0.03 - 4.52	0.33	30	0.05 - 0.39	0.14	26	0.03 - 0.28	0.1	56
Eu	0.01 - 0.10	0.03	57	0.02 - 0.14	0.07	32	0.01 - 0.25	0.09	48
Gd	0.03 - 1.79	0.21	37	0.03 - 0.20	0.1	53	0.02 - 0.25	0.06	58
Dy	0.01 - 0.75	0.09	52	0.01 - 0.10	0.03	58	0.01 - 0.16	0.05	64
Er	0.01 - 2.14	0.03	56	0.01 - 0.04	0.02	68	0.01 - 0.11	0.02	68
Yb	0.02 - 9.49	0.05	54	0.02 - 0.10	0.05	58	0.02 - 0.08	0.03	70
Hf	0.04 - 1.78	0.21	33	0.01 - 0.59	0.13	53	0.01 - 0.79	0.09	42
Ta	0.51 - 40.21	4.55	0	0.63 - 30.83	0.85	0	0.45 - 7.01	1.52	0
W	0.01 - 6.77	0.28	35	0.06 - 0.38	0.15	58	0.04 - 14.07	0.17	56
Au	0.03 - 29.48	0.1	63	0.10 - 1.11	0.23	79	0.02 - 18.70	0.14	76
Tl	0.01 - 0.15	0.03	75	0.01 - 0.03	0.02	79	0.01 - 0.05	0.02	86
Pb	0.17 - 3.82	1.1	0	0.67 - 2.22	1.21	0	0.06 - 15.25	1.96	0
Bi	0.01 - 0.66	0.08	37	0.01 - 2.25	0.12	32	0.03 - 14.26	0.3	38
Th	0.01 - 22.43	0.13	6	0.01 - 2.85	0.12	26	~0.01 - 2.49	0.03	32
U	0.01 - 4.22	0.08	38	0.01 - 3.44	0.02	53	~0.01 - 0.16	0.02	46