

## Appendix II. Glass XRF analyses for major and trace elements

Area	Yellowstone						Jemez Mountains			Lipari
Location	Nez Perce Creek	Upper Basin member	Dry Creek	Solfatara Plateau	Mount Jackson	Lava Creek Tuff	Bear Canyon	Camp May-Pajarito Mtn	Ancho Canyon	Aeolian Arc Italy
Unit	Qpcn	Qpu	Qpcd	Qpcf	Qmj	Qyl	Qbt (Upper Bandelier Tuff)			V. ne Gabelotto
# of Sample	98821	98822	98823	98824	98825	98827	95504	95521	95531	98502
<b>XRF</b>										
SiO <sub>2</sub>	75.42 (0.27)	76.17 (0.27)	76.54 (0.28)	75.36 (0.27)	74.85 (0.27)	75.85 (0.27)	74.36 (0.27)	74.59 (0.27)	75.92 (0.27)	74.16 (0.27)
TiO <sub>2</sub>	0.09 (<.01)	0.14 (<.01)	0.11 (<.01)	0.16 (<.01)	0.04 (<.01)	0.08 (<.01)	0.04 (<.01)	0.08 (<.01)	0.01 (<.01)	0.01 (<.01)
Al <sub>2</sub> O <sub>3</sub>	12.07 (0.14)	12.73 (0.15)	11.86 (0.14)	11.32 (0.13)	13.73 (0.16)	13.10 (0.15)	13.95 (0.16)	12.53 (0.15)	12.21 (0.14)	12.70 (0.15)
FeO	1.43 (0.02)	0.87 (0.01)	1.06 (0.01)	2.04 (0.03)	0.50 (0.01)	0.95 (0.01)	1.06 (0.01)	1.19 (0.02)	1.29 (0.02)	1.28 (0.02)
MnO	0.07 (<.01)	0.00	0.02 (<.01)	0.04 (<.01)	0.00	0.00	0.02 (<.01)	0.02 (<.01)	0.08 (<.01)	0.04 (<.01)
MgO	0.03 (<.01)	0.14 (0.01)	0.01 (<.01)	0.00	0.05 (<.01)	0.01 (<.01)	0.09 (<.01)	0.04 (<.01)	0.07 (<.01)	0.06 (<.01)
CaO	0.44 (0.01)	0.44 (0.01)	0.43 (0.01)	0.55 (0.01)	0.29 (0.01)	0.37 (0.01)	0.00	0.12 (<.01)	0.22 (<.01)	0.72 (0.01)
Na <sub>2</sub> O	3.51 (0.07)	3.46 (0.07)	3.41 (0.07)	3.69 (0.07)	4.36 (0.08)	3.77 (0.07)	4.36 (0.08)	4.20 (0.08)	4.13 (0.08)	3.75 (0.07)
K <sub>2</sub> O	5.16 (0.26)	5.08 (0.25)	4.94 (0.25)	4.73 (0.24)	4.99 (0.25)	4.96 (0.25)	4.78 (0.24)	4.59 (0.23)	4.27 (0.21)	4.90 (0.24)
P <sub>2</sub> O <sub>5</sub>	0.01 (<.01)	0.01 (<.01)	0.03 (<.01)	0.01 (<.01)	0.01 (<.01)	0.01 (<.01)	0.04 (<.01)	0.02 (<.01)	0.02 (<.01)	0.00
Total	98.23	99.04	98.41	97.90	98.82	99.10	98.70	97.38	98.22	97.62
ASI <sup>(1)</sup>	0.99	1.06	1.01	0.93	1.05	1.07	1.13	1.04	1.03	0.99
Al	0.94	0.88	0.92	0.99	0.92	0.88	0.89	0.95	0.93	0.90
Rb	206 (11.9)	194 (11.2)	200 (11.5)	153 (8.8)	317 (18.3)	196 (11.3)	185 (10.7)	116 (6.7)	311 (17.9)	293 (16.9)
Sr	5 (0.2)	30 (1.2)	8 (0.3)	6 (0.2)	n.d.	15 (0.6)	9 (0.4)	12 (0.5)	6 (0.2)	9 (0.4)
Ba	113 (3.9)	511 (17.5)	161 (5.5)	553 (18.9)	n.d.	262 (9.0)	35 (1.2)	92 (3.1)	19 (0.6)	5 (0.2)
Y	80 (3.7)	32 (1.5)	59 (2.7)	69 (3.2)	64 (3.0)	25 (1.2)	44 (2.0)	25 (1.2)	112 (5.2)	41 (1.9)
Zr	286 (12.0)	177 (7.4)	241 (10.1)	455 (19.1)	150 (6.3)	224 (9.4)	268 (11.2)	298 (12.5)	284 (11.9)	128 (5.4)
Nb	92 (6.8)	58 (4.3)	78 (5.8)	82 (6.1)	67 (5.0)	65 (4.8)	111 (8.2)	71 (5.3)	221 (16.4)	50 (3.7)
Th	32	16	29	25	22	9	24	14	37	42
La	109	47	100	105	24	23	23	20	61	
Ce	204	58	182	191	45	30	58	80	140	
Nd	90	21					30	23	62	

Number in parentheses represents standard errors.

<sup>(1)</sup> ASI = molar Al<sub>2</sub>O<sub>3</sub>/(CaO+Na<sub>2</sub>O+K<sub>2</sub>O); Al = molar (Na<sub>2</sub>O+K<sub>2</sub>O)/Al<sub>2</sub>O<sub>3</sub>

n.d. = Not detectable; Blank = not determined.

## Appendix II. Glass XRF analyses for major and trace elements (continued)

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## Appendix II. Glass XRF analyses for major and trace elements (continued)

Area	Taylor Creek			Jemez Mountains		
Location	North Boiler Peak	Penamoum Canyon	Kemp Mesa	BM 8407	Jemez Falls	Las Conchas Campground
Unit	BLP	DGC	KPM	Qvvf (South Mountain Rhyolite-SMC)		
# of Sample	98912	98913	98914	93908B	95811B	98901
<b>XRF</b>						
SiO <sub>2</sub>	73.01 (0.26)	74.79 (0.27)	75.07 (0.27)		73.25 (0.26)	74.20 (0.27)
TiO <sub>2</sub>	0.06 (<.01)	0.07 (<.01)	0.15 (<.01)		0.00	0.02 (<.01)
Al <sub>2</sub> O <sub>3</sub>	14.16 (0.17)	13.50 (0.16)	13.31 (0.16)		13.81 (0.16)	13.16 (0.15)
FeO	0.58 (0.01)	0.59 (0.01)	0.75 (0.01)		0.00	0.40 (0.01)
MnO	0.06 (<.01)	0.03 (<.01)	0.06 (<.01)		0.06 (<.01)	0.04 (<.01)
MgO	0.12 (<.01)	0.06 (<.01)	0.11 (<.01)		0.07 (<.01)	0.14 (0.01)
CaO	0.17 (<.01)	0.20 (<.01)	0.24 (<.01)		0.67 (0.01)	0.49 (0.01)
Na <sub>2</sub> O	4.45 (0.08)	4.54 (0.09)	3.89 (0.07)		4.25 (0.08)	3.70 (0.07)
K <sub>2</sub> O	5.21 (0.26)	4.83 (0.24)	5.22 (0.26)		4.42 (0.22)	4.49 (0.22)
P <sub>2</sub> O <sub>5</sub>	0.01 (<.01)	0.02 (<.01)	0.01 (<.01)		0.00	0.00
Total	97.83	98.63	98.81		96.53	96.64
ASI	1.07	1.03	1.07		1.06	1.11
AI	0.92	0.94	0.91		0.85	0.83
Rb	412 (23.8)	412 (23.8)	324 (18.7)		228 (13.2)	261 (15.1)
Sr	3 (0.1)	3 (0.1)	7 (0.3)		19 (0.8)	8 (0.3)
Ba	17 (0.6)	n.d.	40 (1.4)		78 (2.7)	36 (1.2)
Y	29 (1.3)	36 (1.7)	70 (3.2)		55 (2.5)	61 (2.8)
Zr	156 (6.5)	137 (5.7)	158 (6.6)		85 (3.6)	91 (3.8)
Nb	65 (4.8)	65 (4.8)	80 (5.9)		87 (6.5)	105 (7.8)
Th	39	34	42		36	40
La	13	13	49		29	25
Ce	85	86	110		61	68
Nd						