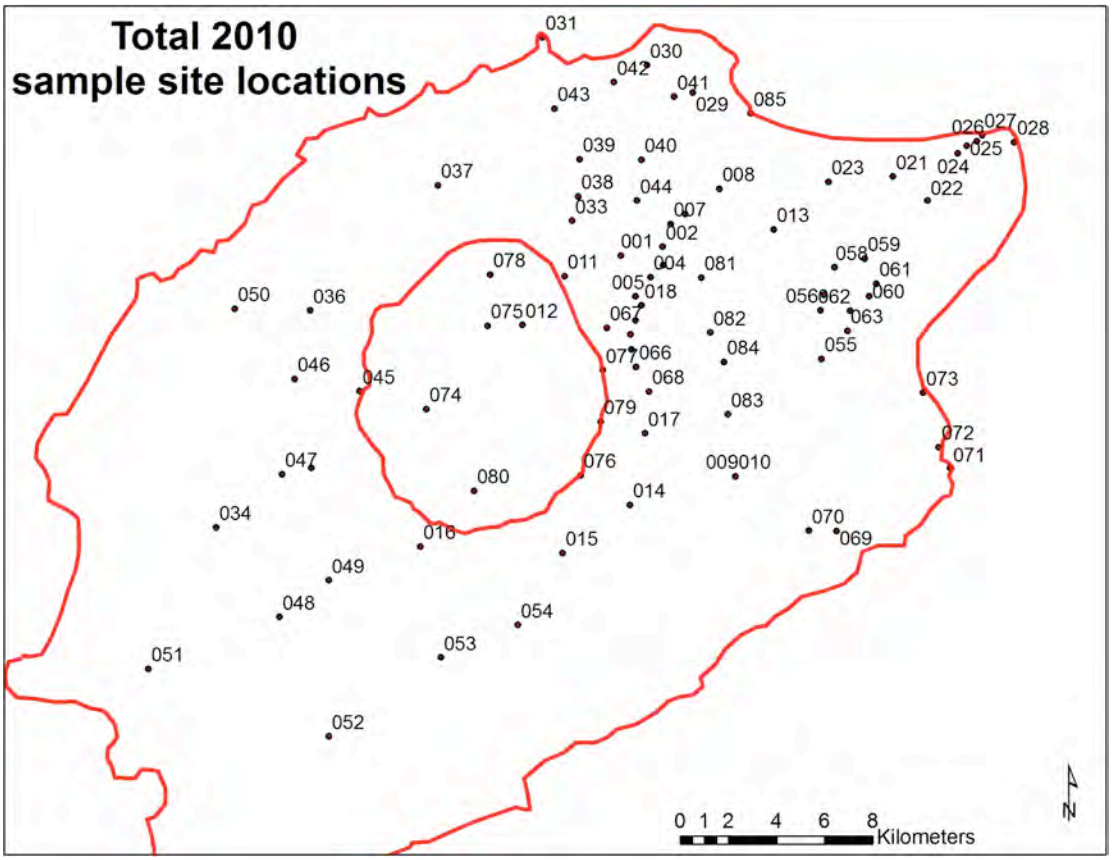
Appendix A: Stratigraphic Sections

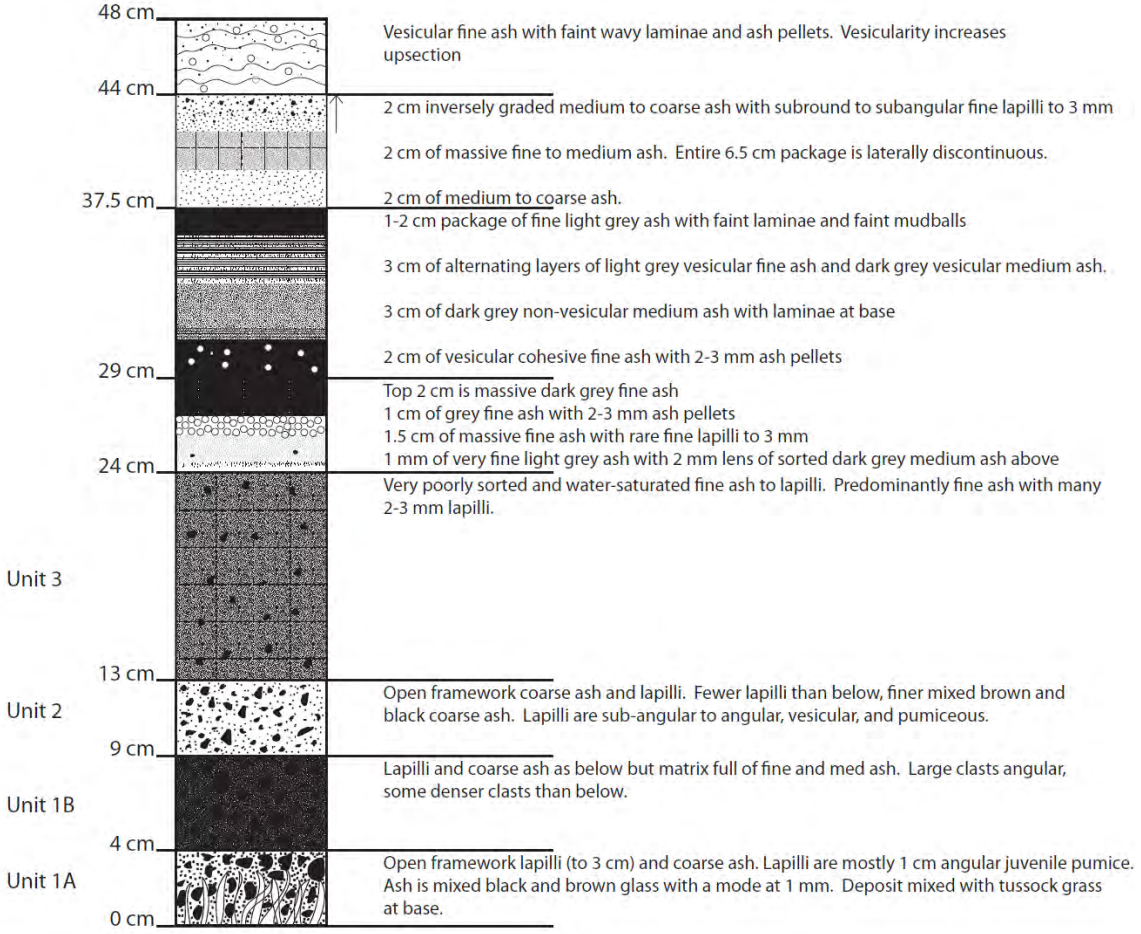


Locations of stratigraphic sections labeled with last three numbers of section name.

10JAUOK001 is 60 cm tephra not described in detail.

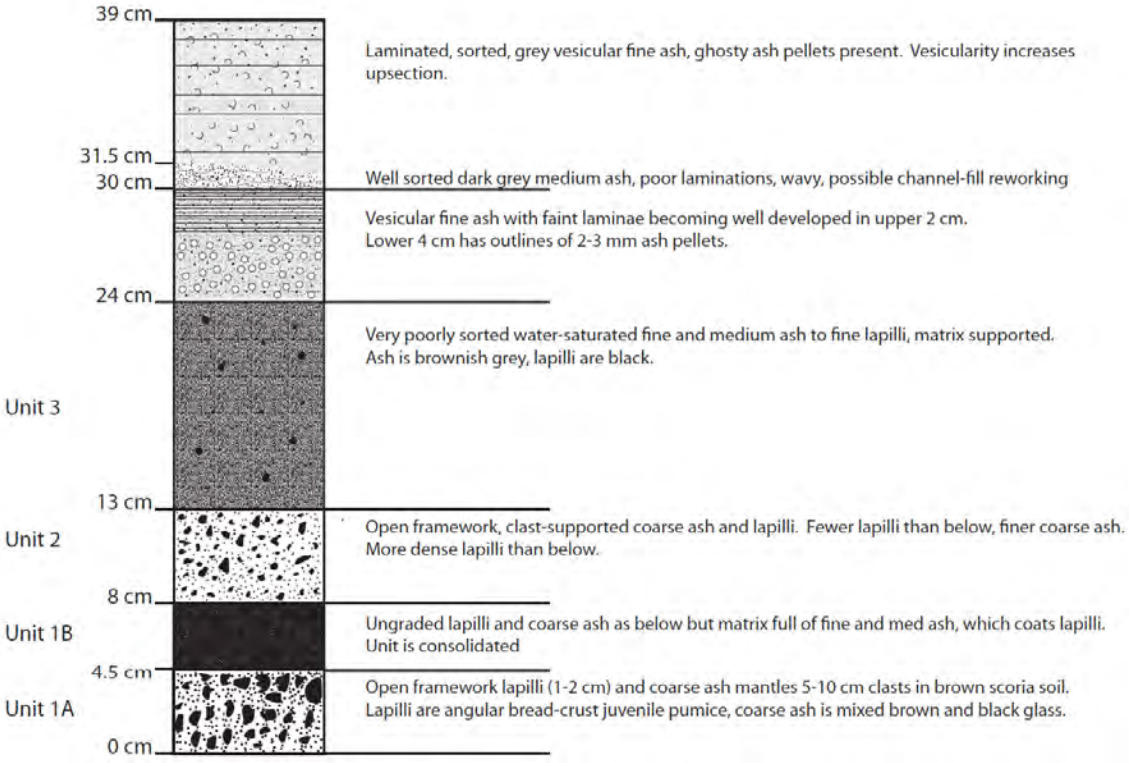
10JAUOK002

Location: E. Side Crater Creek



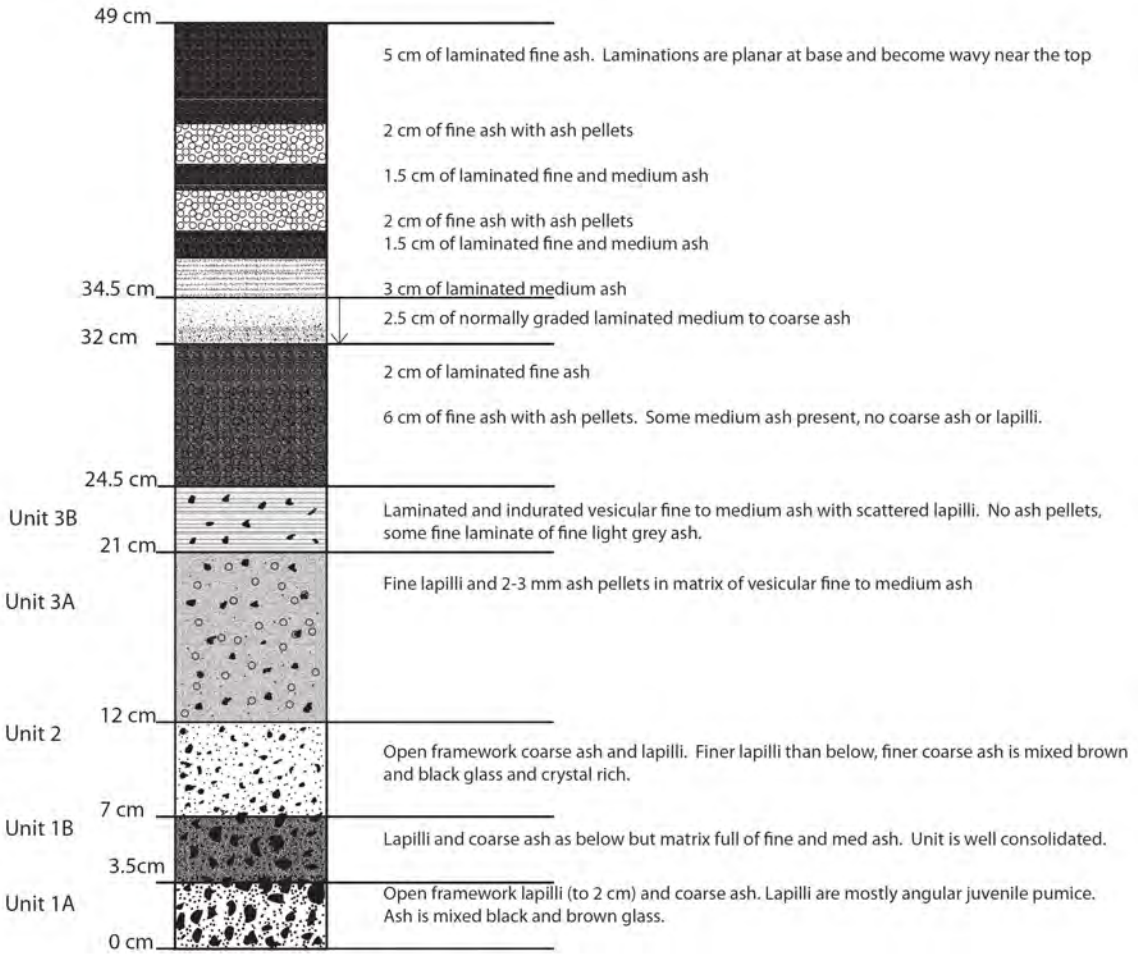
10JAUOK003

Location: E. Side Crater Creek



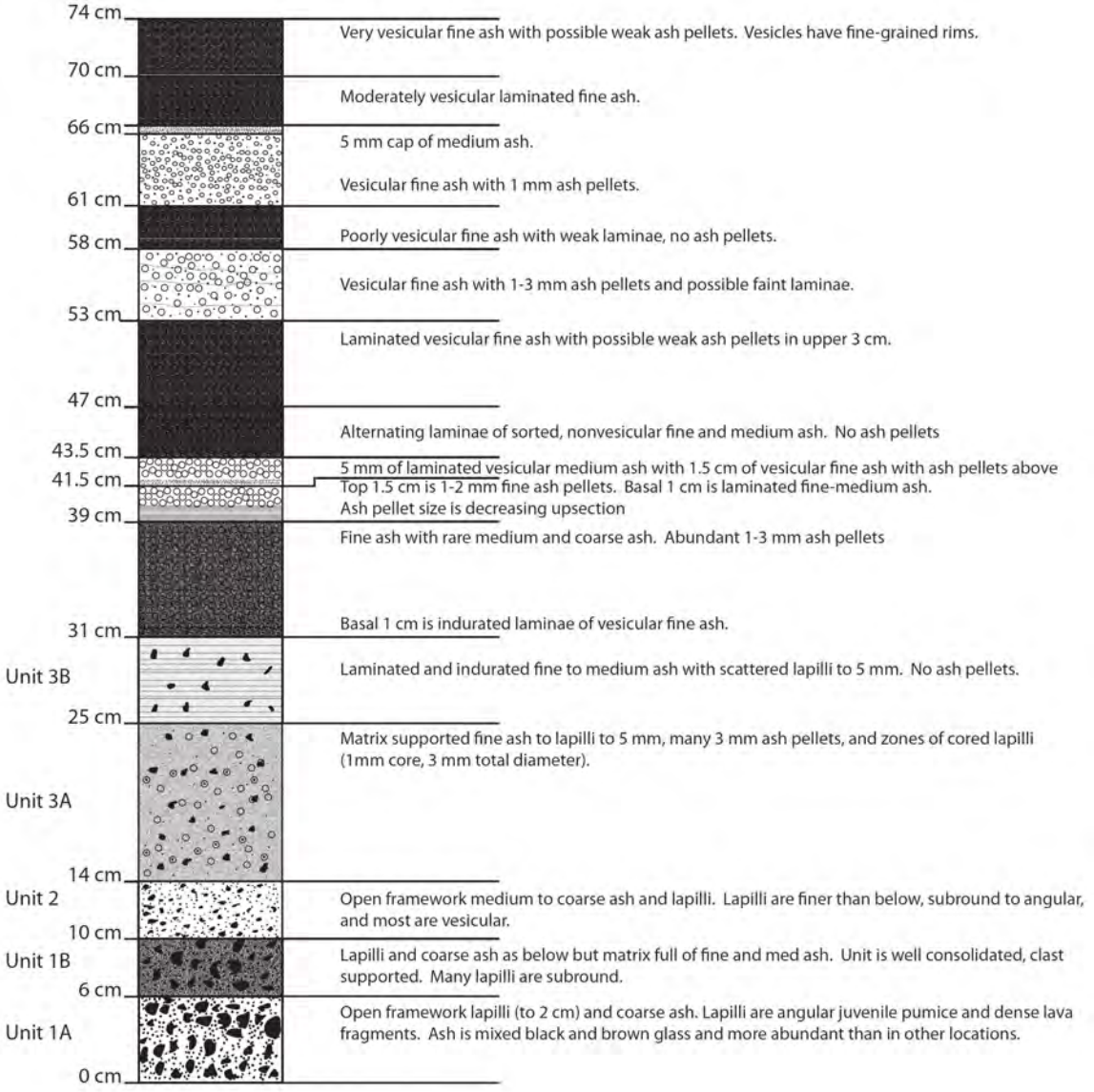
10JAUOK004

Location: E. Side Crater Creek



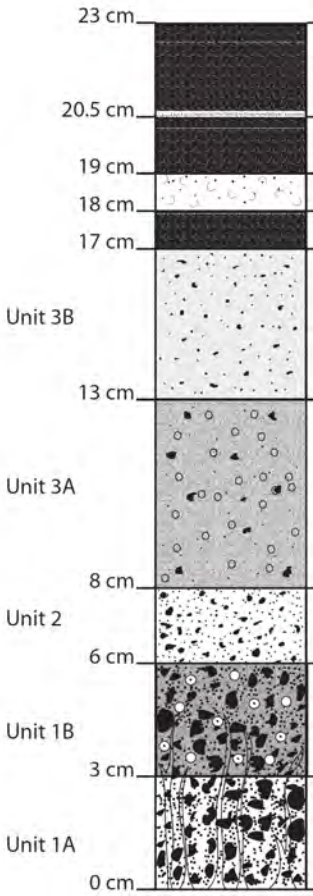
10JAUOK005

Location: E. Side Crater Creek



10JAUOK006

Location: E. Side Crater Creek



Very vesicular fine ash with possible ghosty mudballs, vesicularity increases upsection.

2-3 mm layer of medium ash at base, much is dense and black.

Laminated fine ash.

Vesicular fine ash with possible ghosty ash pellets.

Laminated fine ash.

Fine ash with coarse ash to fine lapilli. Lapilli are smaller but more abundant than below. Matrix of fine ash is coarser than below. Better sorted than Unit 3A below.

Fine lapilli and 2-3 mm ash pellets in matrix of fine ash.

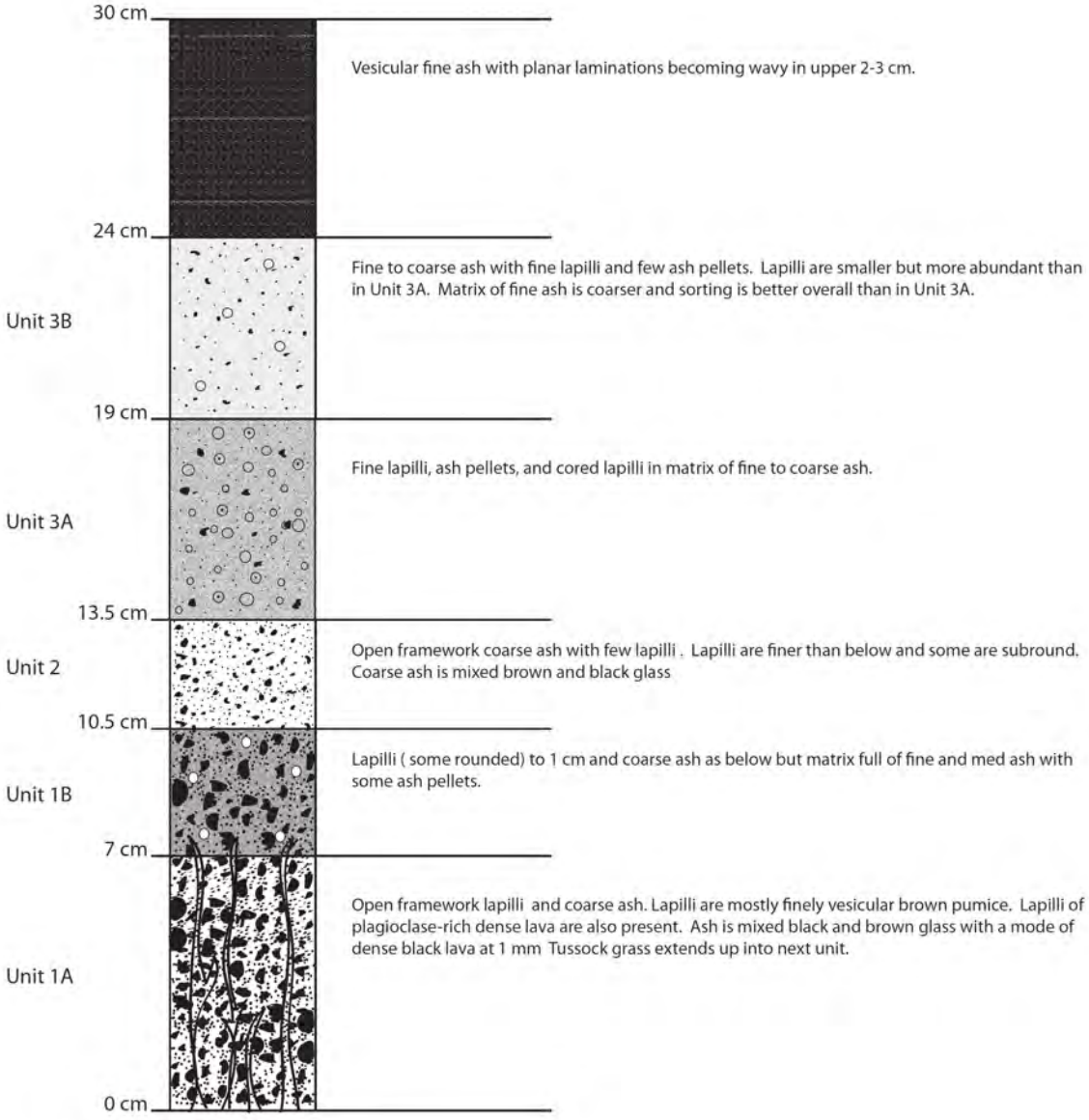
Open framework coarse ash and lapilli to 8 mm. Finer lapilli than below, some are subround. Coarse ash is mixed brown and black glass with black glass more prevalent.

Lapilli (some rounded) and coarse ash as below but matrix full of fine and med ash. Cored lapilli and ash pellets are present.

Open framework lapilli (to 2 cm) and coarse ash. Lapilli are mostly finely vesicular brown pumice. Some lapilli resemble ribbon bombs. Ash is mixed black and brown glass. Tussock grass extends up into next unit.

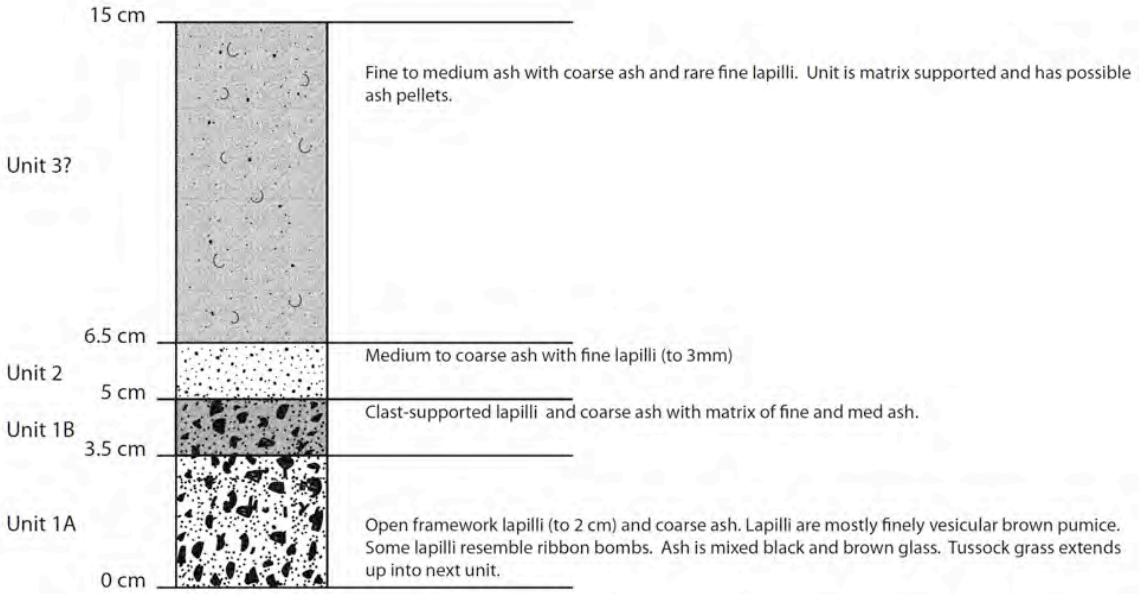
10JAUOK007

Location: E. Side Crater Creek



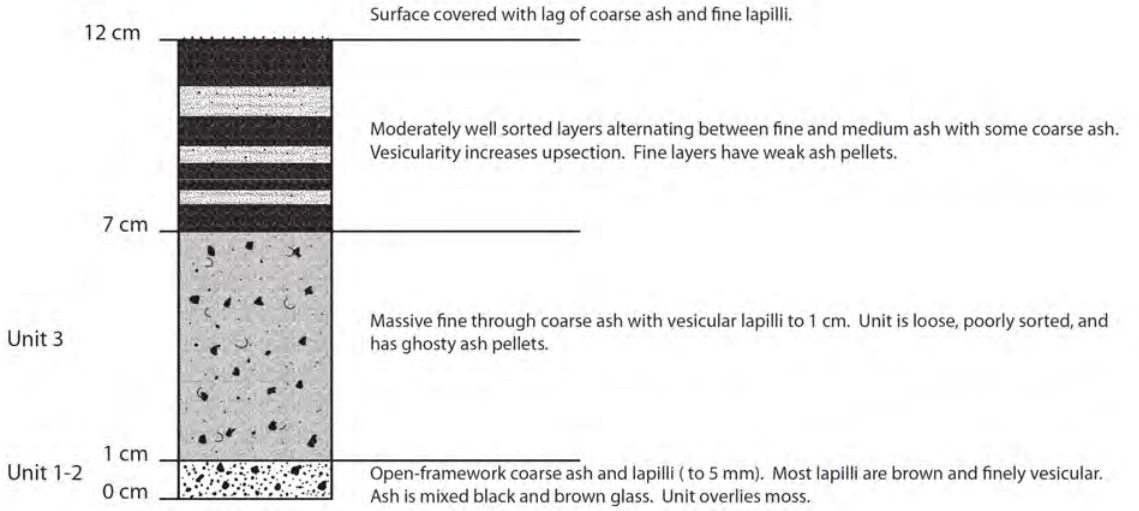
10JAUOK008

Location: E. Side Crater Creek



10JAUOK009

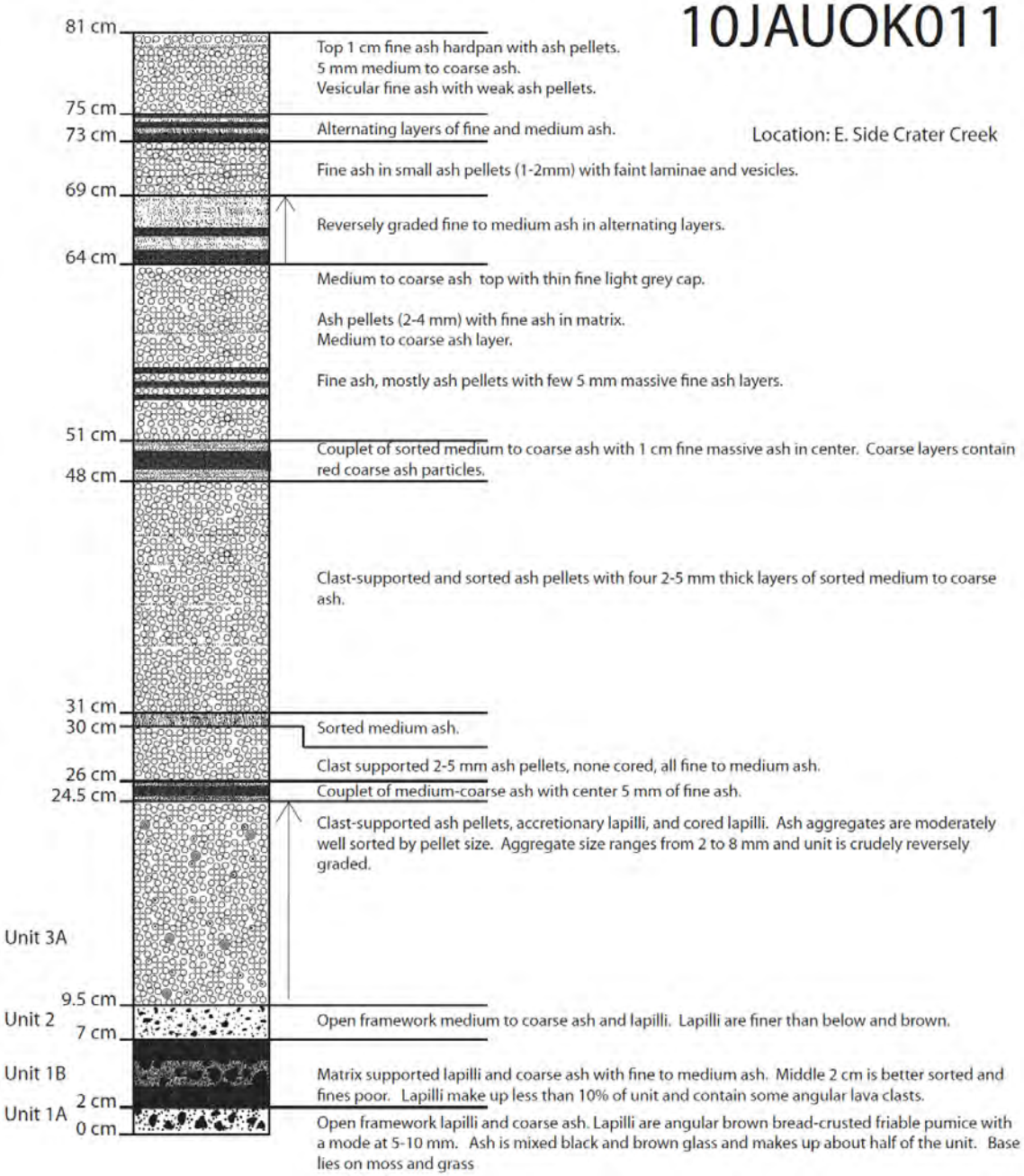
Location: S. Side 33 Creek above Fort Glenn



Section 10JAUOK010 was described within a few meters of 10JAUOK009. Section 10JAUOK009 was determined to be more representative of deposits in this area.

10JAUOK011

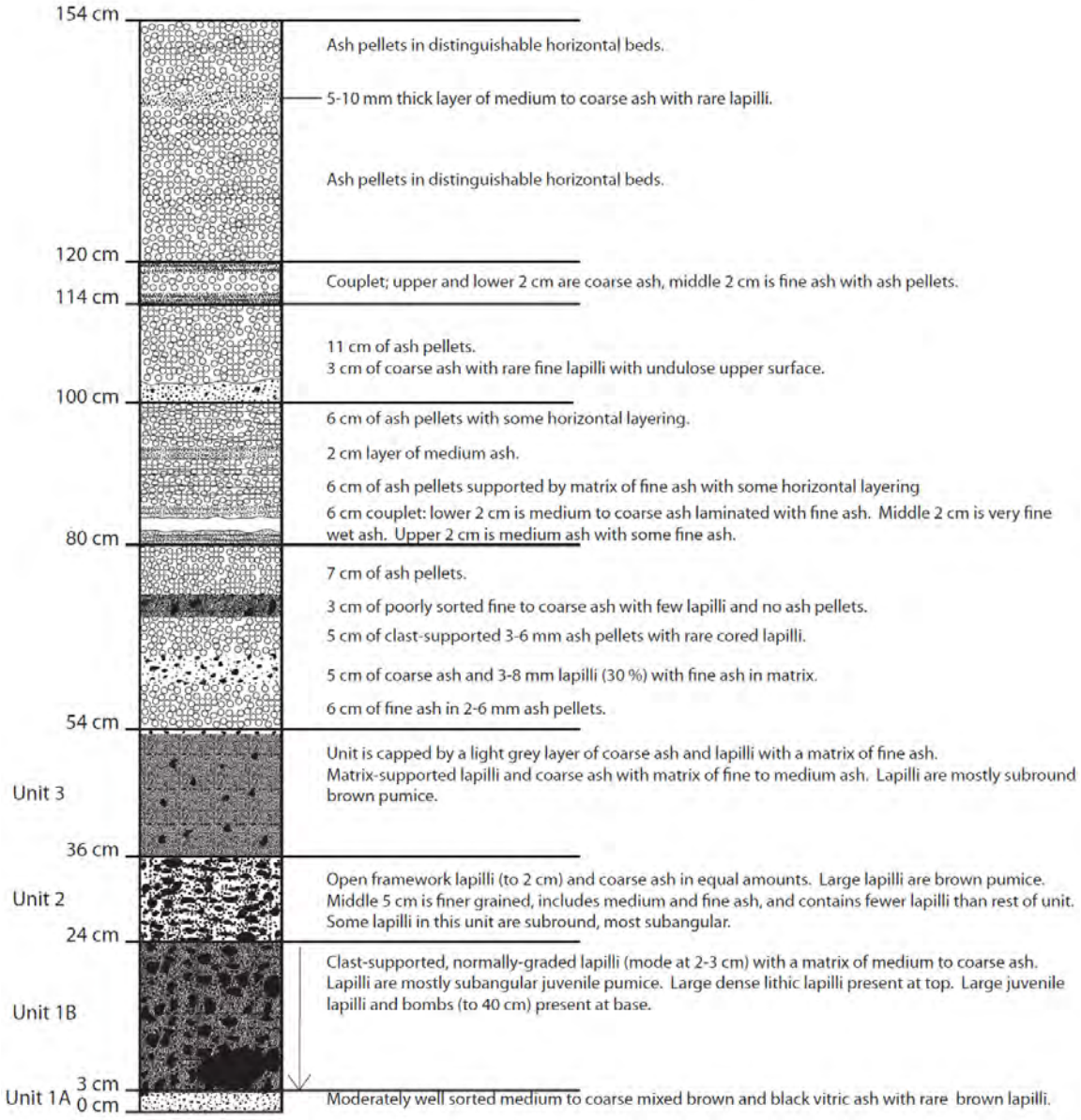
Location: E. Side Crater Creek



10JAUOK012

Lower 154 cm

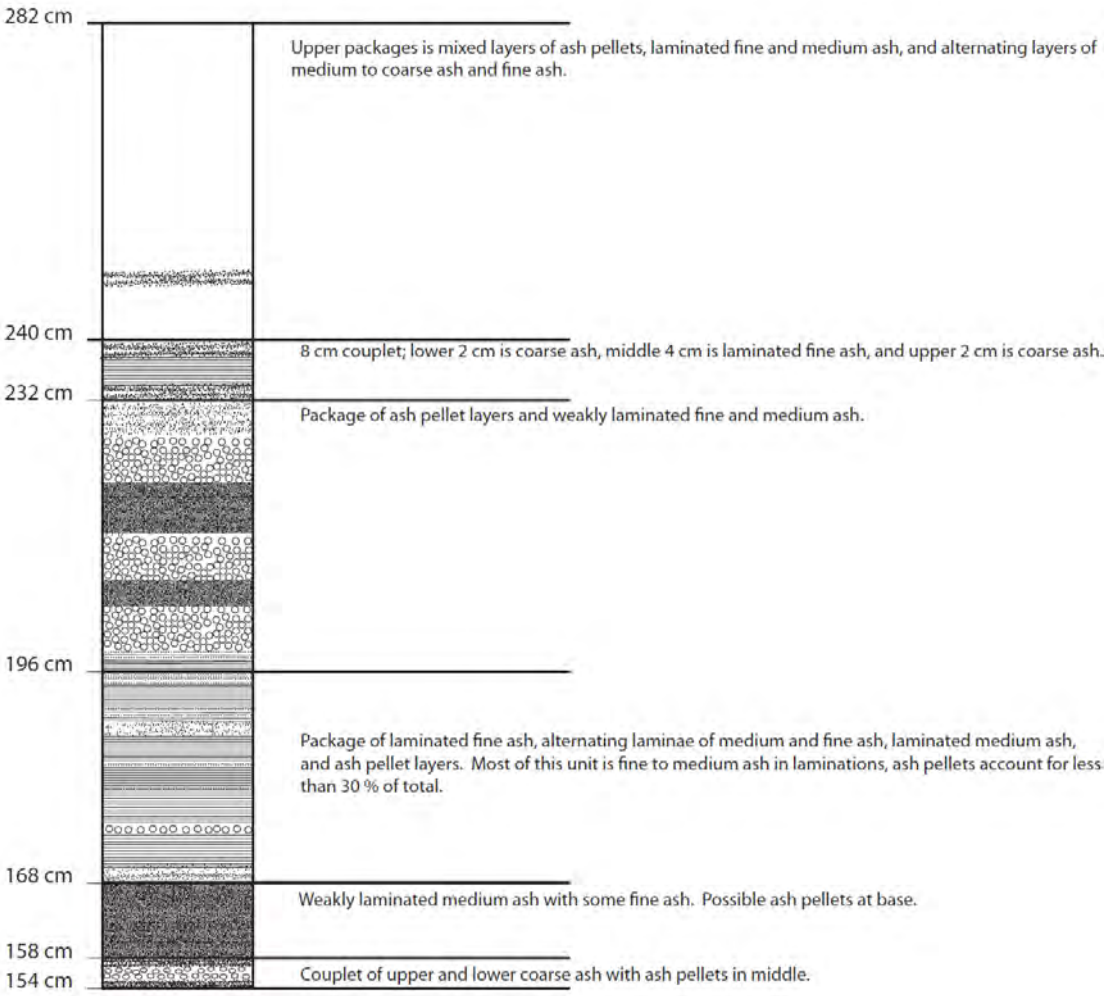
Location: In caldera, Cone B bench.



10JAUOK012

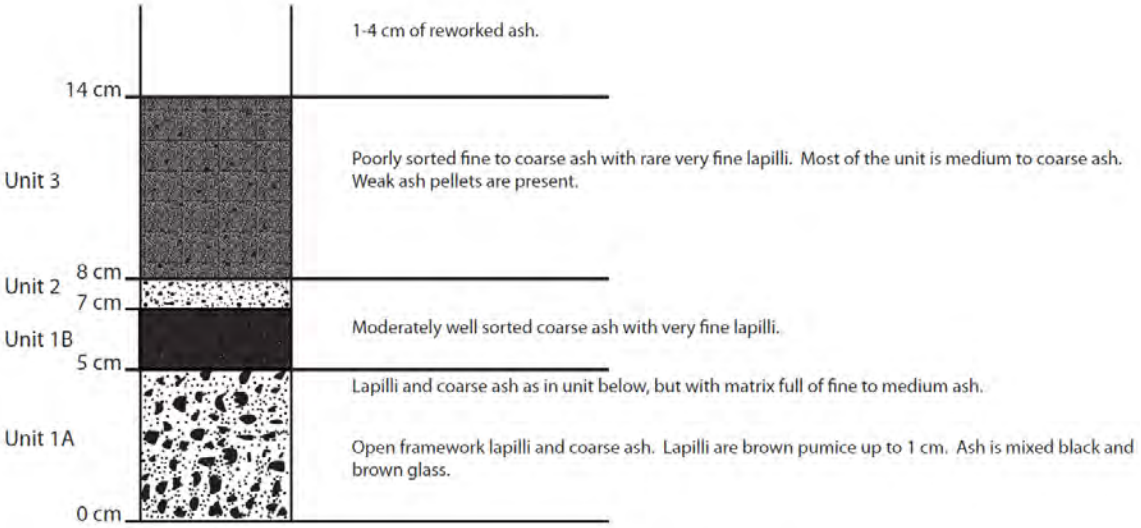
Upper 128 cm

Location: In caldera, Cone B bench.



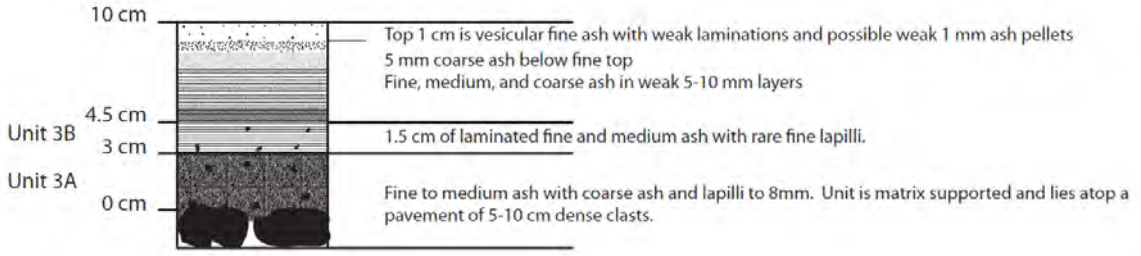
10JAUOK013

Location: On plain north of Idak



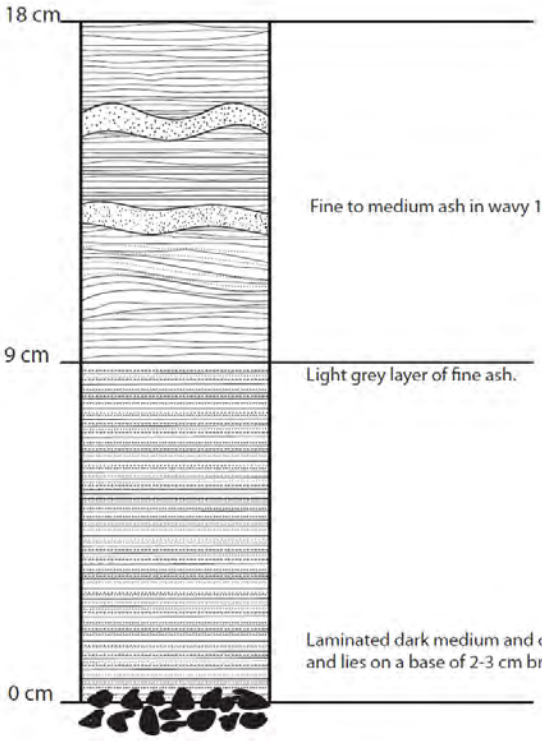
10JAUOK014

Location: East side Tulik, below Station OKTU



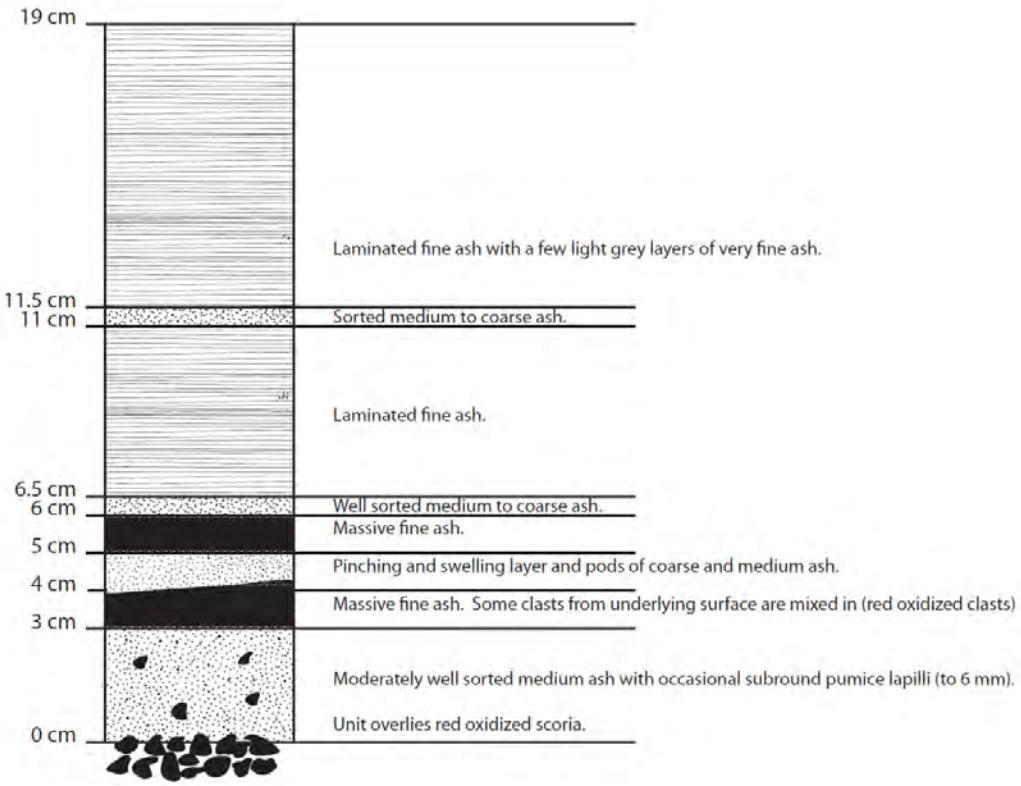
10JAUOK015

Location: West Side of Tulik



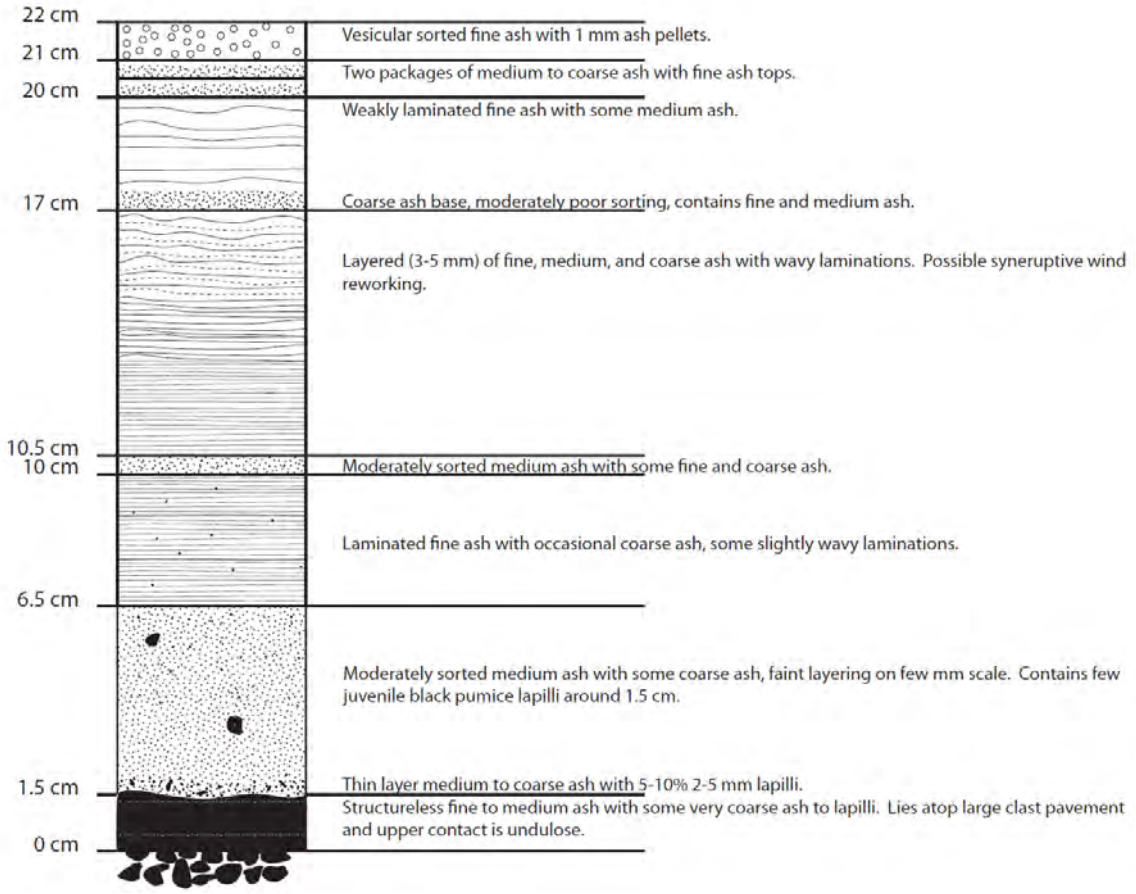
10JAUOK016

Location: East of Jag Peak



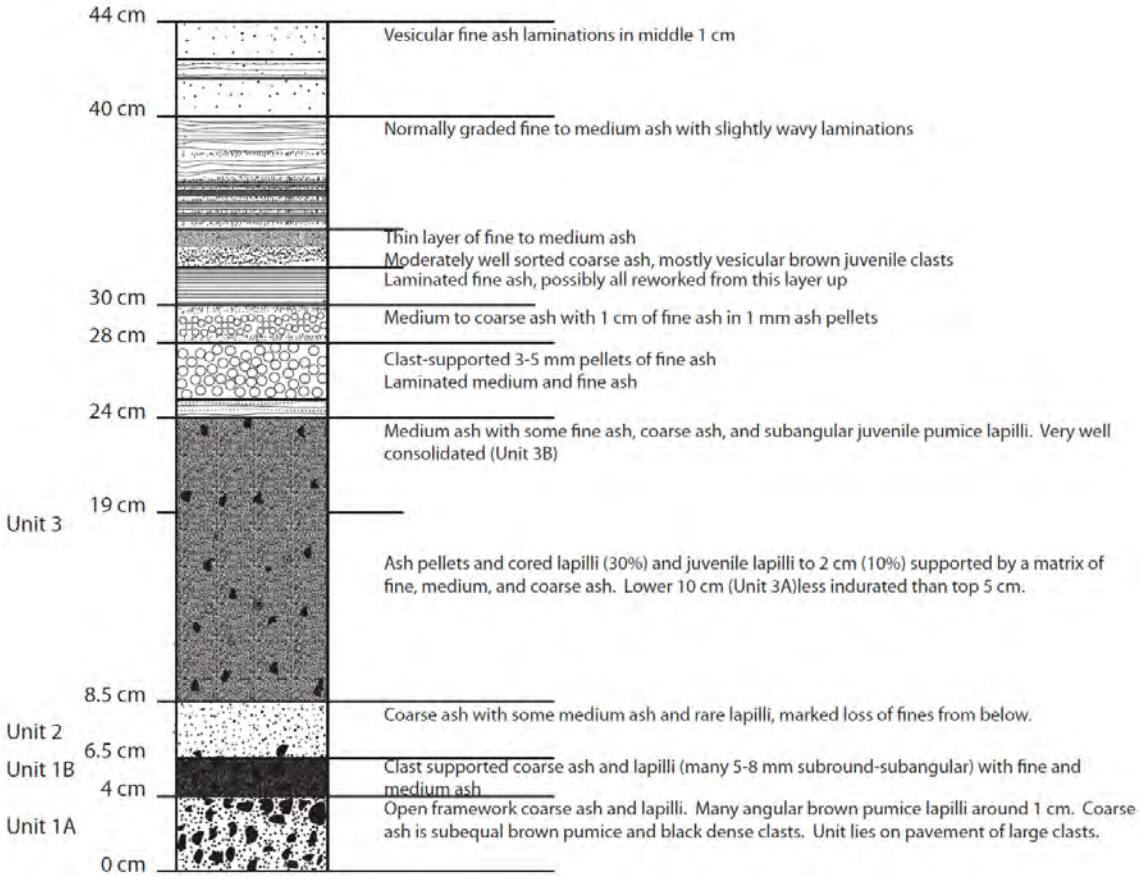
10JAUOK017

Location: Flanks East of Tulik



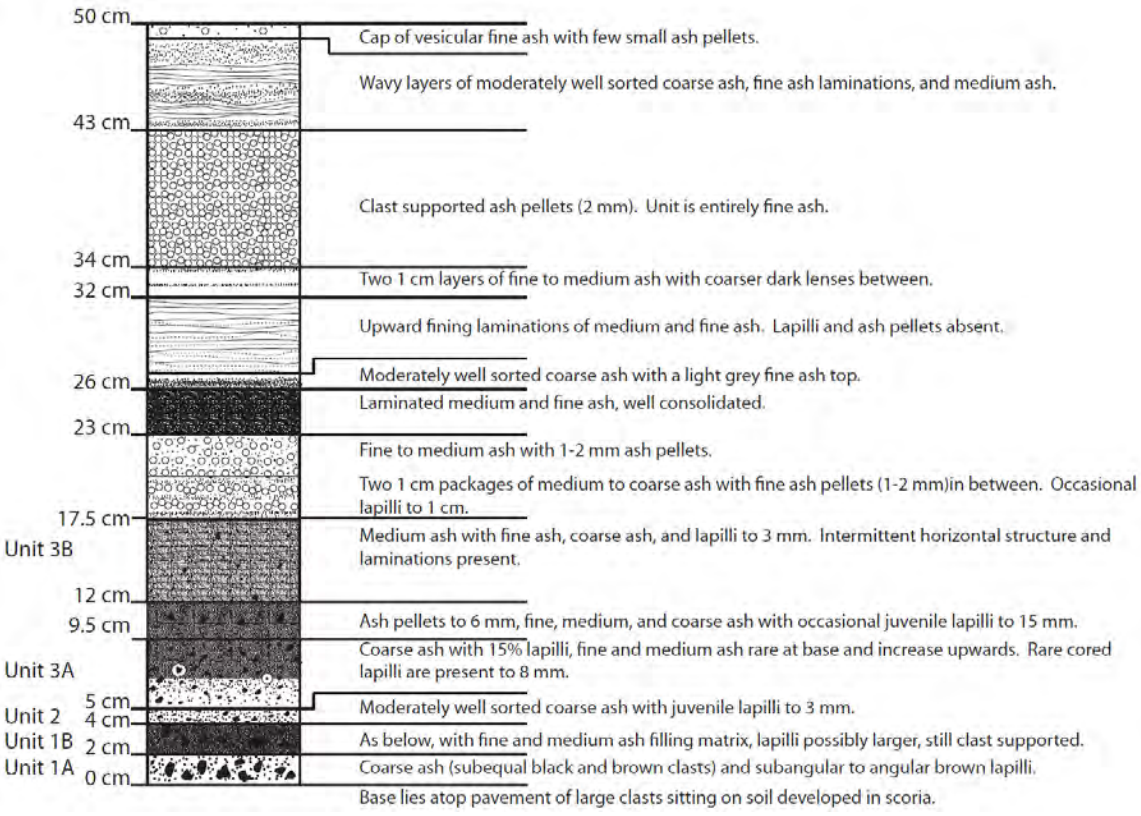
10JAUOK018

Location: Upper East Flanks



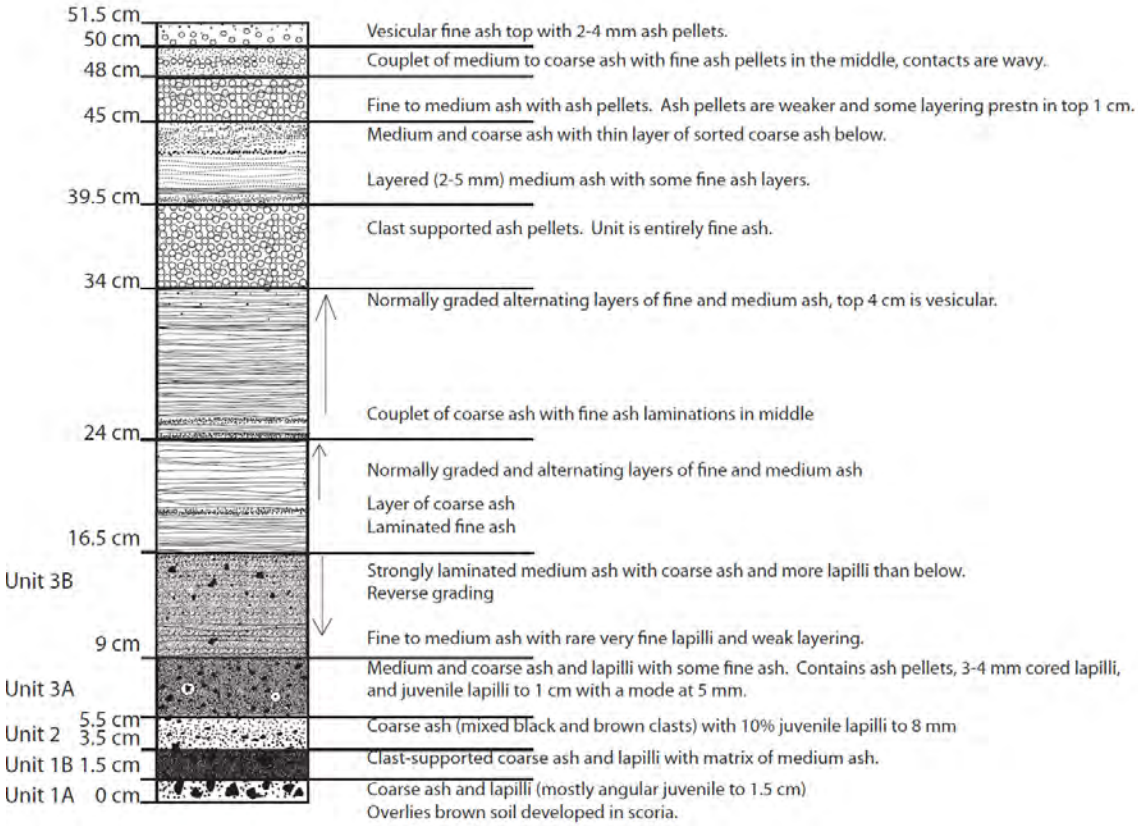
10JAUOK019

Location: Upper East Flanks



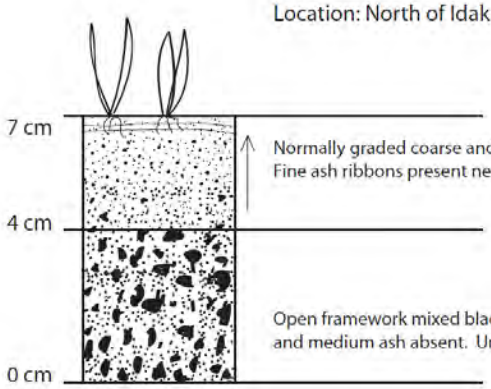
10JAUOK020

Location: Upper East Flanks



10JAUOK021

Location: North of Idak

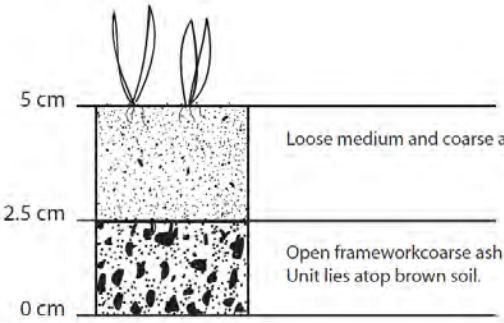


Normally graded coarse and medium ash, fine lapilli present throughout.
Fine ash ribbons present near top.

Open framework mixed black and brown coarse ash and brown pumice lapilli to 1.5 cm. Fine and medium ash absent. Unit lies atop brown soil.

10JAUOK022

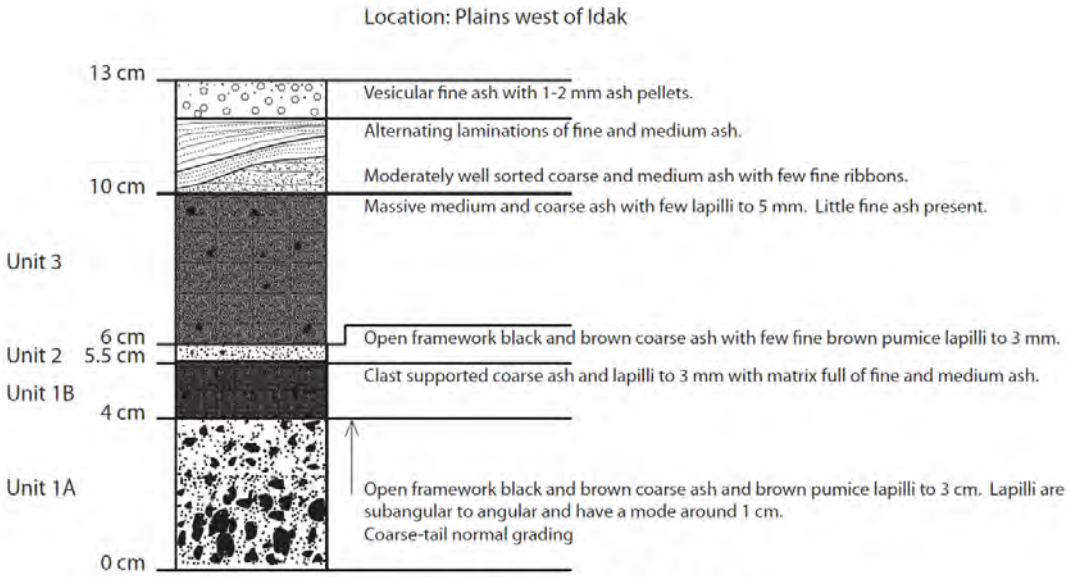
Location: North of Idak



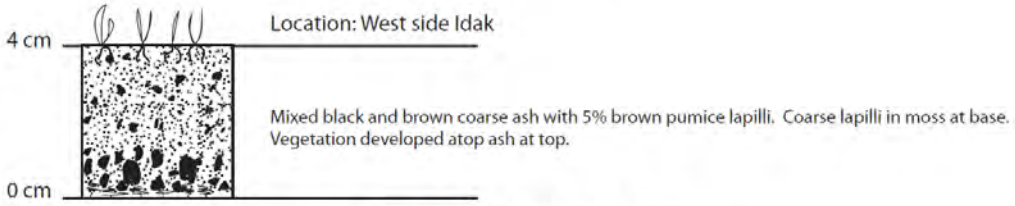
Loose medium and coarse ash with some very fine lapilli to 2 mm.

Open frameworkcoarse ash and lapilli to 1 cm.
Unit lies atop brown soil.

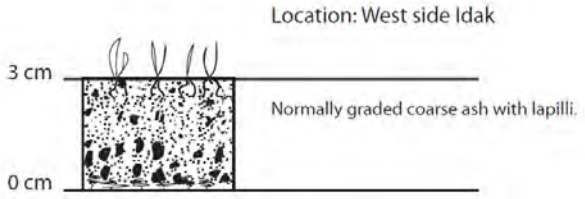
10JAUOK023



10JAUOK024



10JAUOK025

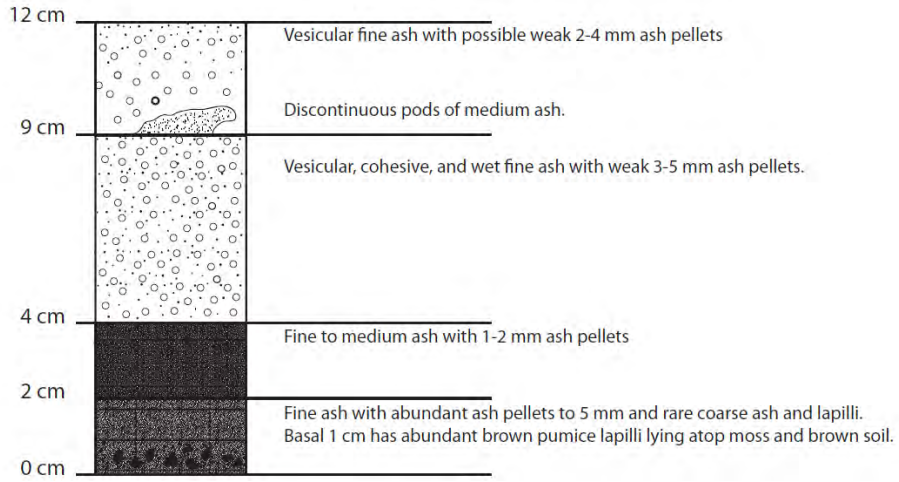


10JAUOK026 is 2 cm medium to coarse ash with fine lapilli.
10JAUOK027 is 3 cm ash.
10JAUOK028 is 4 cm upward-fining coarse ash with lapilli and medium ash at top.
10JAUOK029 is 1 cm or less medium and fine ash in vegetation.
10JAUOK030 is 2 cm fine ash in roots.
10JAUOK031 has no detectable ash

10JAUOK032 has no detectable ash.

10JAUOK033

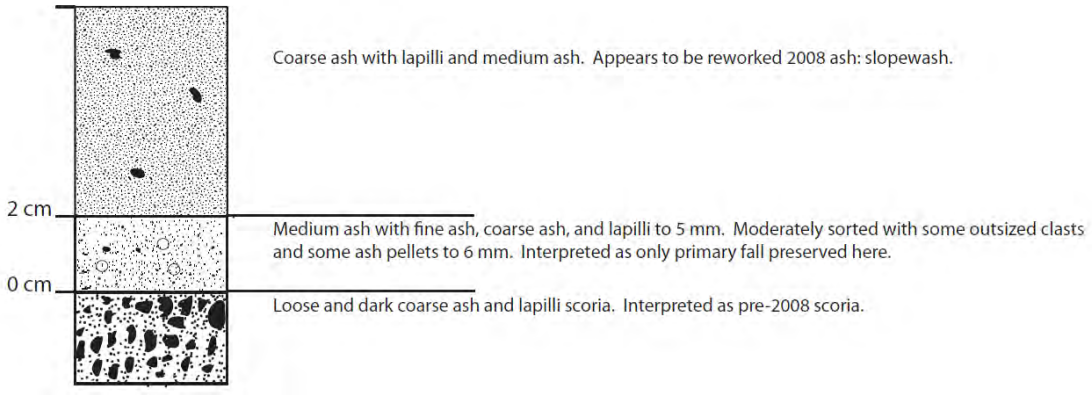
Location: Plains west of Crater Creek



10JAUOK034 is 1.5 cm gray fine ash in moss.

10JAUOK035

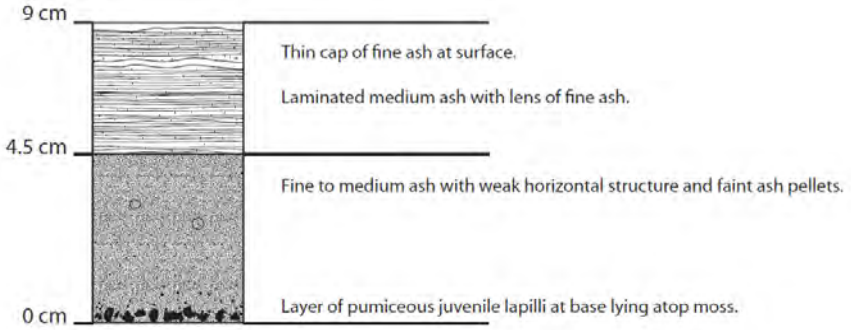
Location: Middle west flanks



10JAUOK036 is 1 cm gray fine ash.
10JAUOK037 is 0.5 cm fine ash.

10JAUOK038

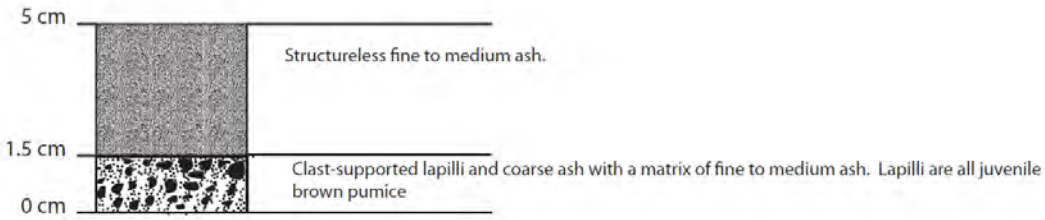
Location: Plains west of Crater Creek



10JAUOK039 is 3 cm fine to medium ash with coarse ash and lapilli at base.

10JAUOK040

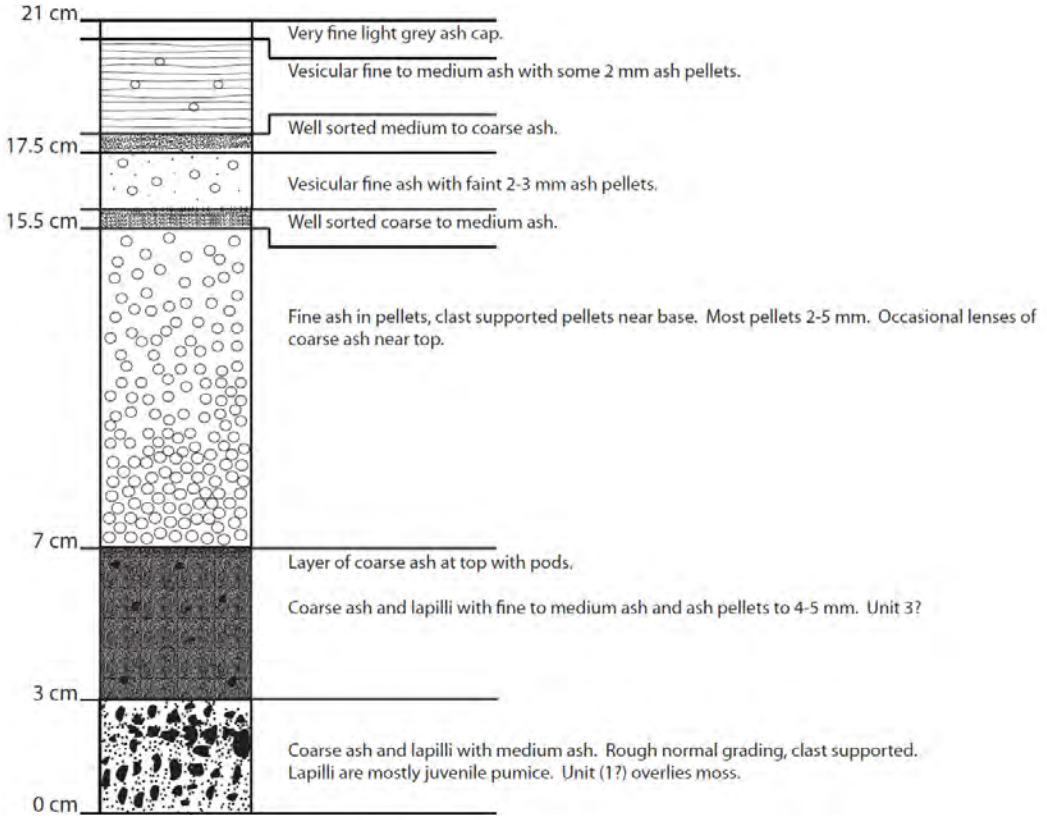
Location:



10JAUOK041 is 2 cm fine to medium ash with some coarse clasts.
10JAUOK042 is 1 cm fine ash in moss with few coarse ash clasts.
10JAUOK043 is 0.5 cm fine ash.

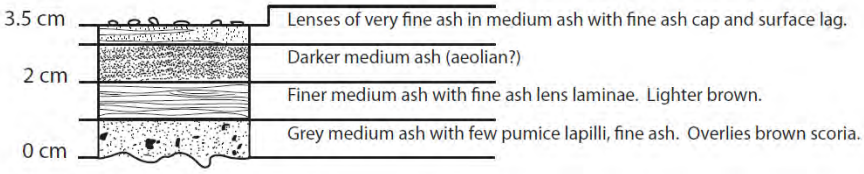
10JAUOK044

Location: Near Crater Creek



10JAUOK045

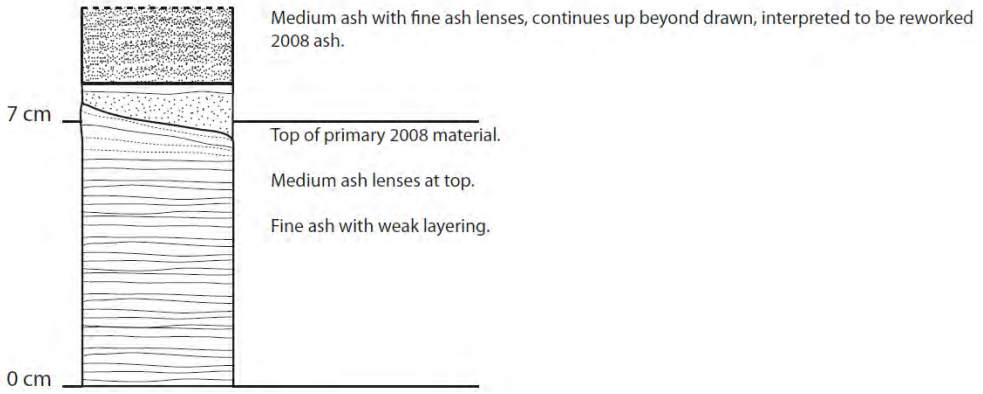
Location: West side caldera rim



10JAUOK046 is 1 cm fine ash.
10JAUOK047 is 2 cm fine to medium ash.

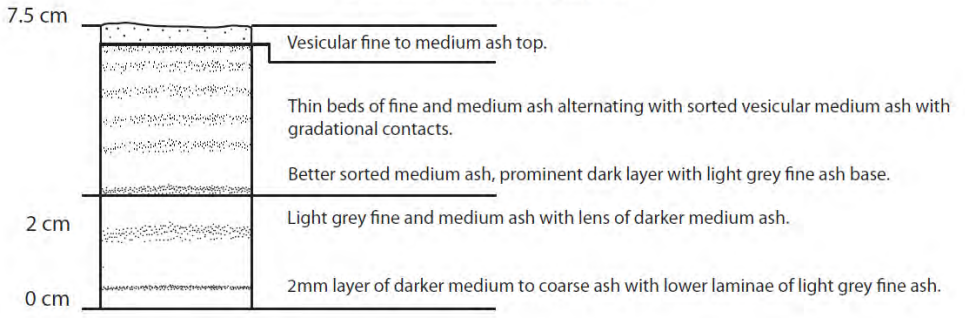
10JAUOK048

Location: Southwest flanks



10JAUOK049

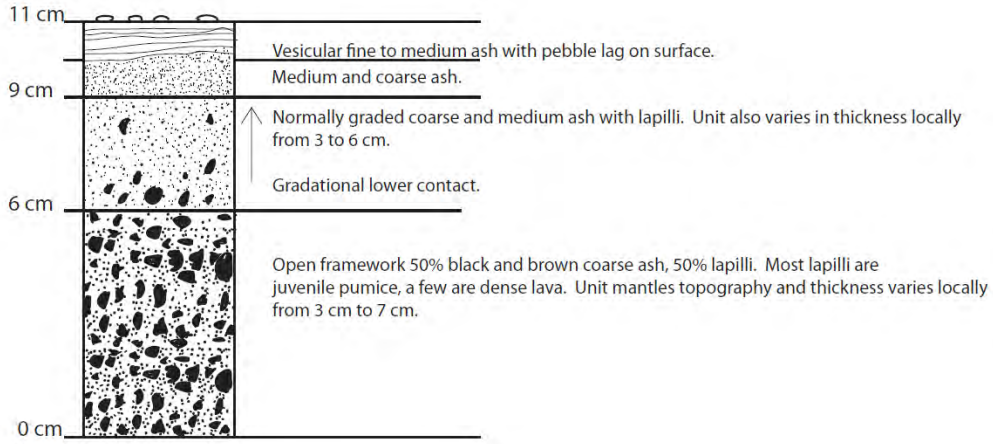
Location: West side caldera rim



10JAUOK050 is 0.3 – 0.5 cm fine ash.
10JAUOK051 is 1 cm fine ash with some medium ash.
10JAUOK052 is 1.5-2.0 cm with 0.7 cm fine ash at base and 0.8 cm med ash at top.
10JAUOK053 is 3 cm ash, bottom 1.5 cm is fine ash, upper 1.5 cm is medium ash.
10JAUOK054 is 3.5 cm fine to medium ash.
10JAUOK055 is 8 cm with 4 cm coarse ash and lapilli at base, 3 cm medium ash, and 1 cm fine ash at top.

10JAUOK056

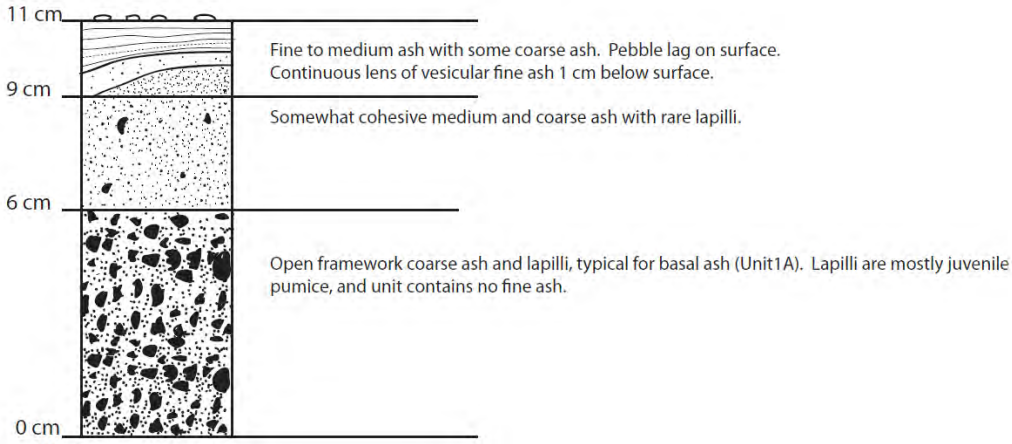
Location: Near Reindeer camp southwest of Idak



10JAUOK057 is 10 cm, 4 cm coarse ash and lapilli at base, 3 cm medium ash, and 3 cm fine ash at top.

10JAUOK058

Location: Around north side of Idak

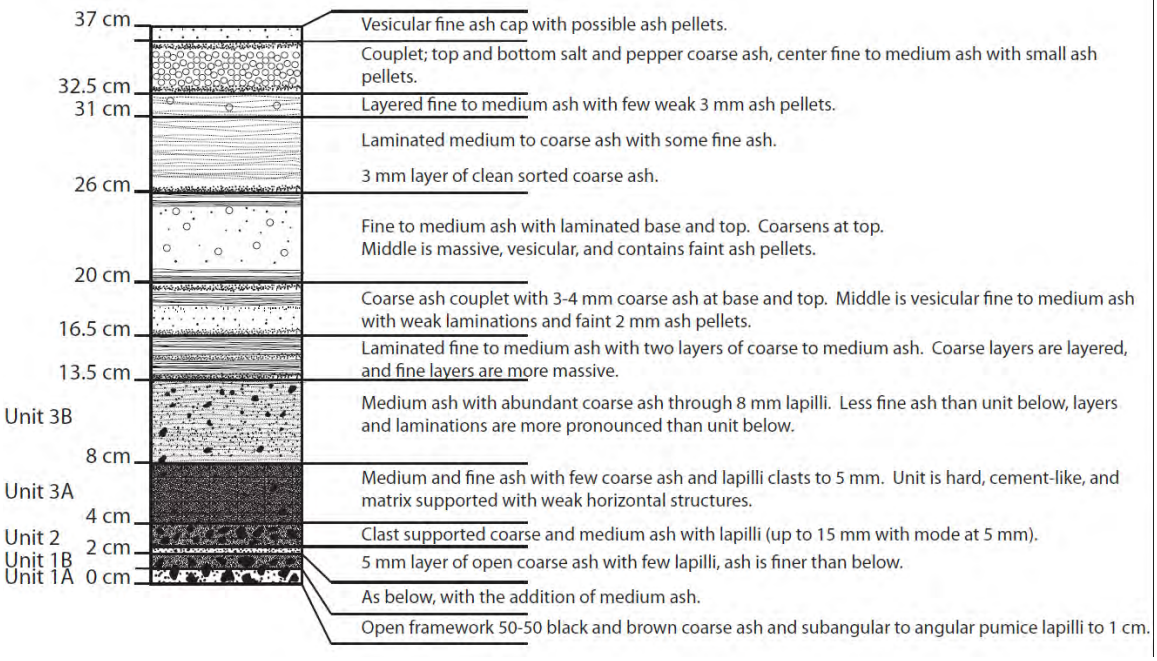


10JAUOK059 is 5 cm 2 cm coarse ash and lapilli at base and 3 cm medium ash at top.
10JAUOK060 is 6 cm coarse ash and lapilli with medium ash at top.
10JAUOK061 is 5.5 cm ash, bottom 2 cm is open-framework coarse ash and lapilli, middle 2 cm is medium ash with fine ash and coarse ash with few fine lapilli, top 1.5 cm is medium to coarse ash.

10JAUOK062 is 10 cm tephra, bottom 4 cm is open-framework coarse ash and lapilli, next 3 cm is medium ash with lapilli, next 2 cm is fine ash, top 1 cm is coarse ash.
10JAUOK063 is 7 cm tephra, bottom 4 cm is coarse ash with lapilli, middle 2 cm is medium ash with coarse ash and lapilli, and top 1 cm vesicular fine ash with weak laminations.

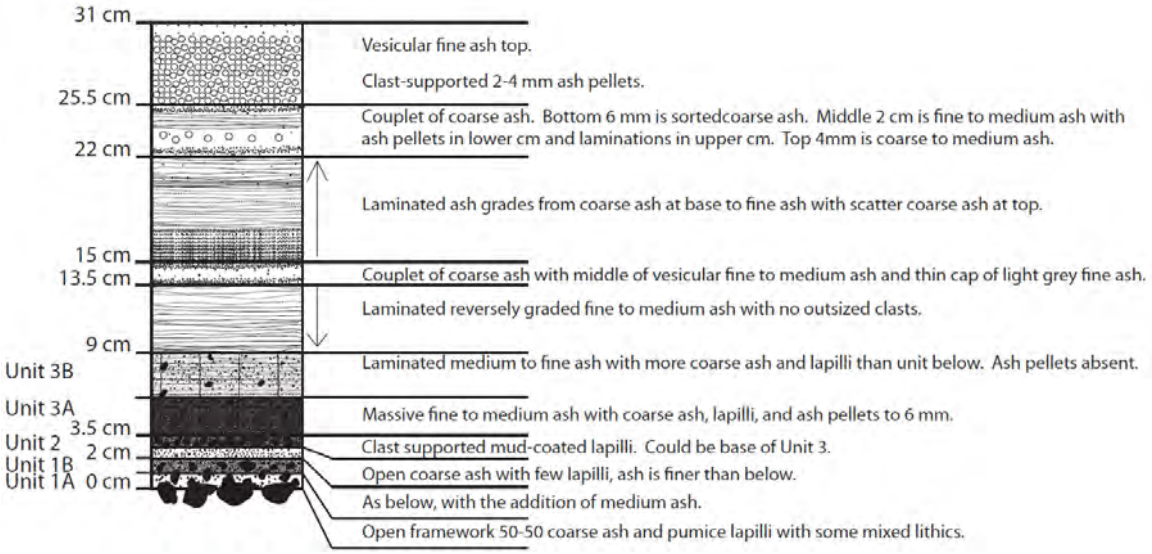
10JAUOK064

Location: Upper East Flanks



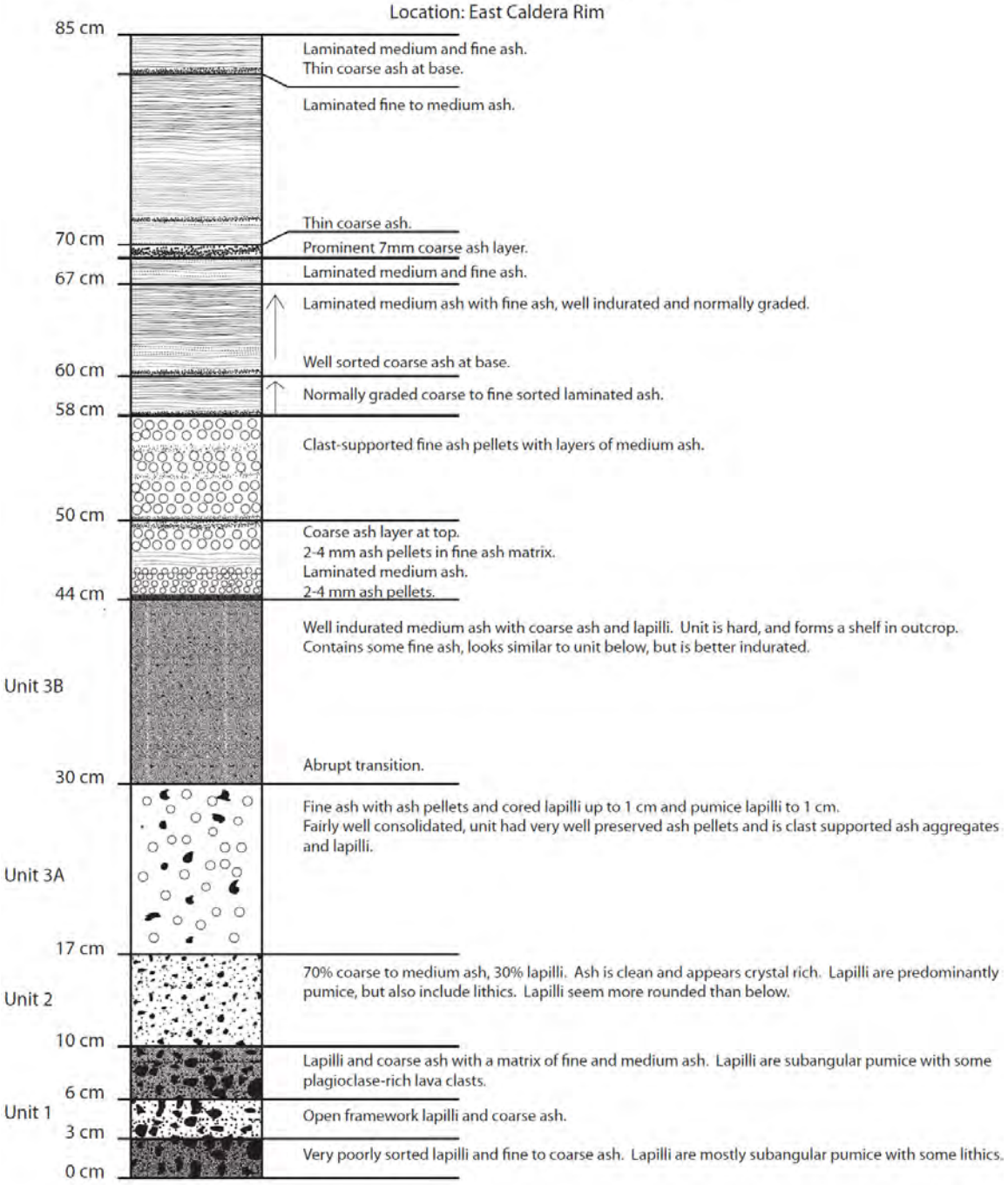
10JAUOK066

Location: Upper East Flanks



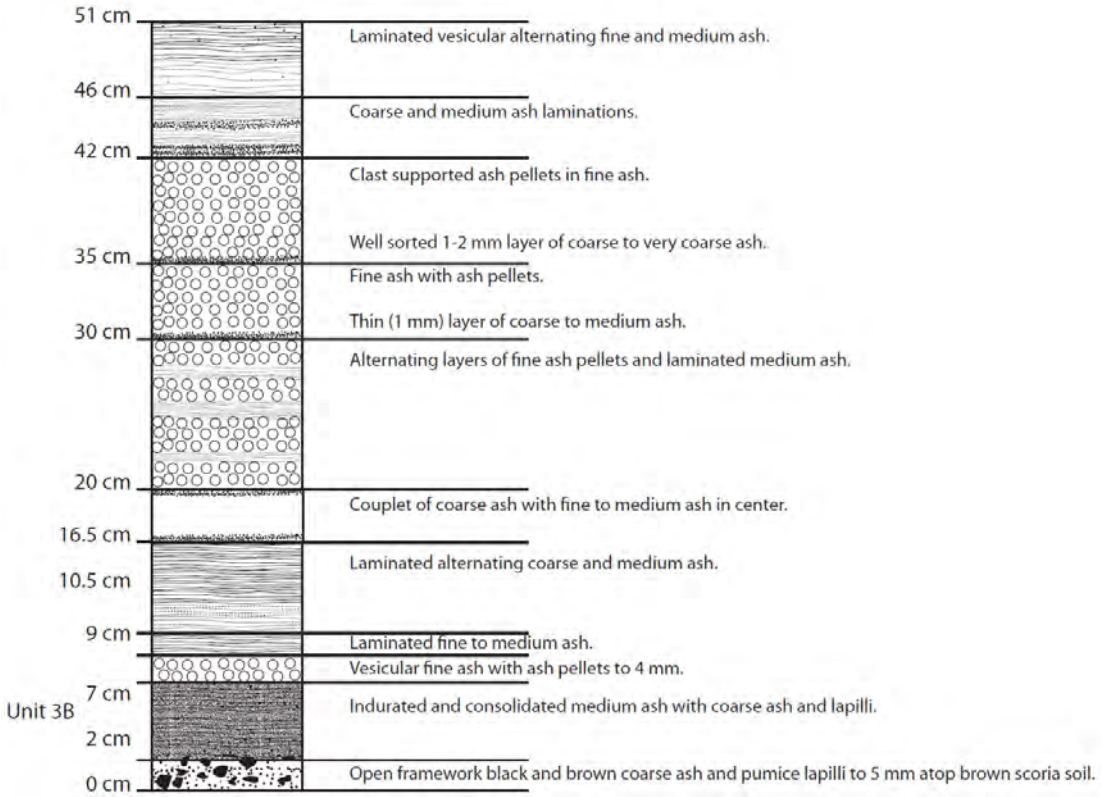
10JAUOK067

Location: East Caldera Rim



10JAUOK068

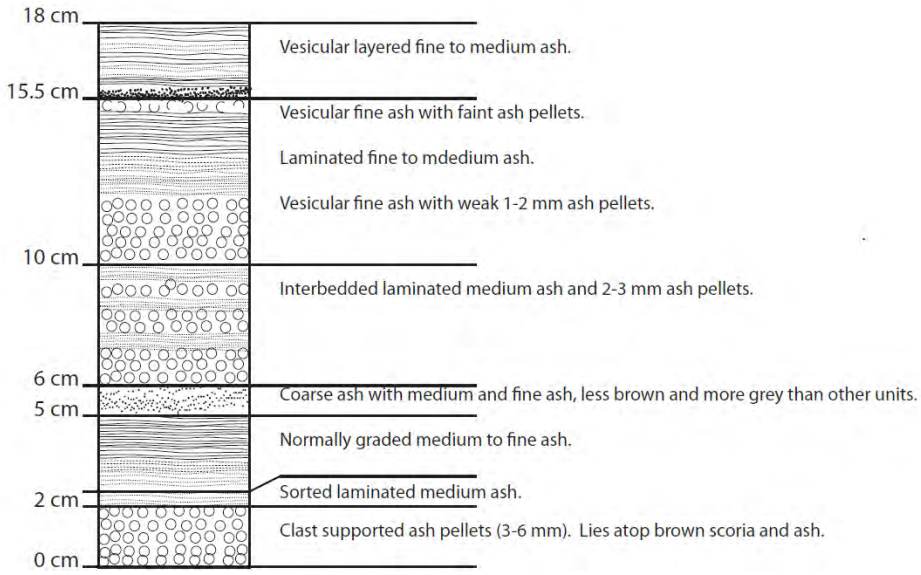
Location: East Flanks



10JAUOK069 is 3 cm medium ash with fine ash, coarse ash, and lapilli to 7 mm.
10JAUOK070 is 3 cm ash.
10JAUOK071 is 3 cm ash, bottom 1 cm is coarse ash, top 2 cm is medium to fine ash.
10JAUOK072 is 3 cm ash, bottom 1 cm is coarse ash, top 2 cm is medium to fine ash.
10JAUOK073 is 4.5 cm, bottom 2 cm is open-framework coarse ash and few very fine lapilli, top 2.5 cm is medium to fine ash.

10JAUOK074

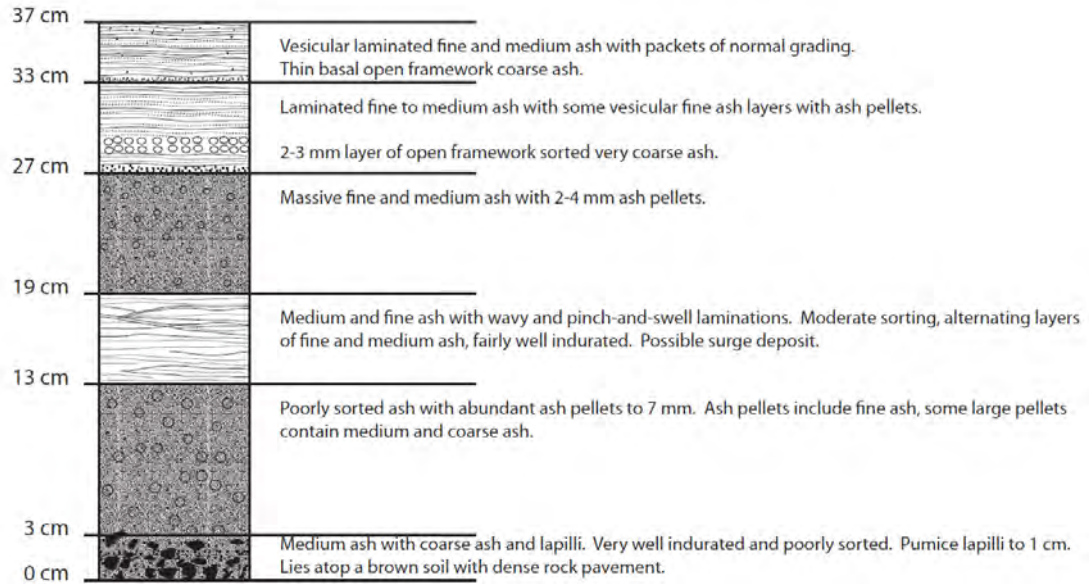
Location: Cone E



10JAUOK075 is 93 cm tephra and was not described in detail.

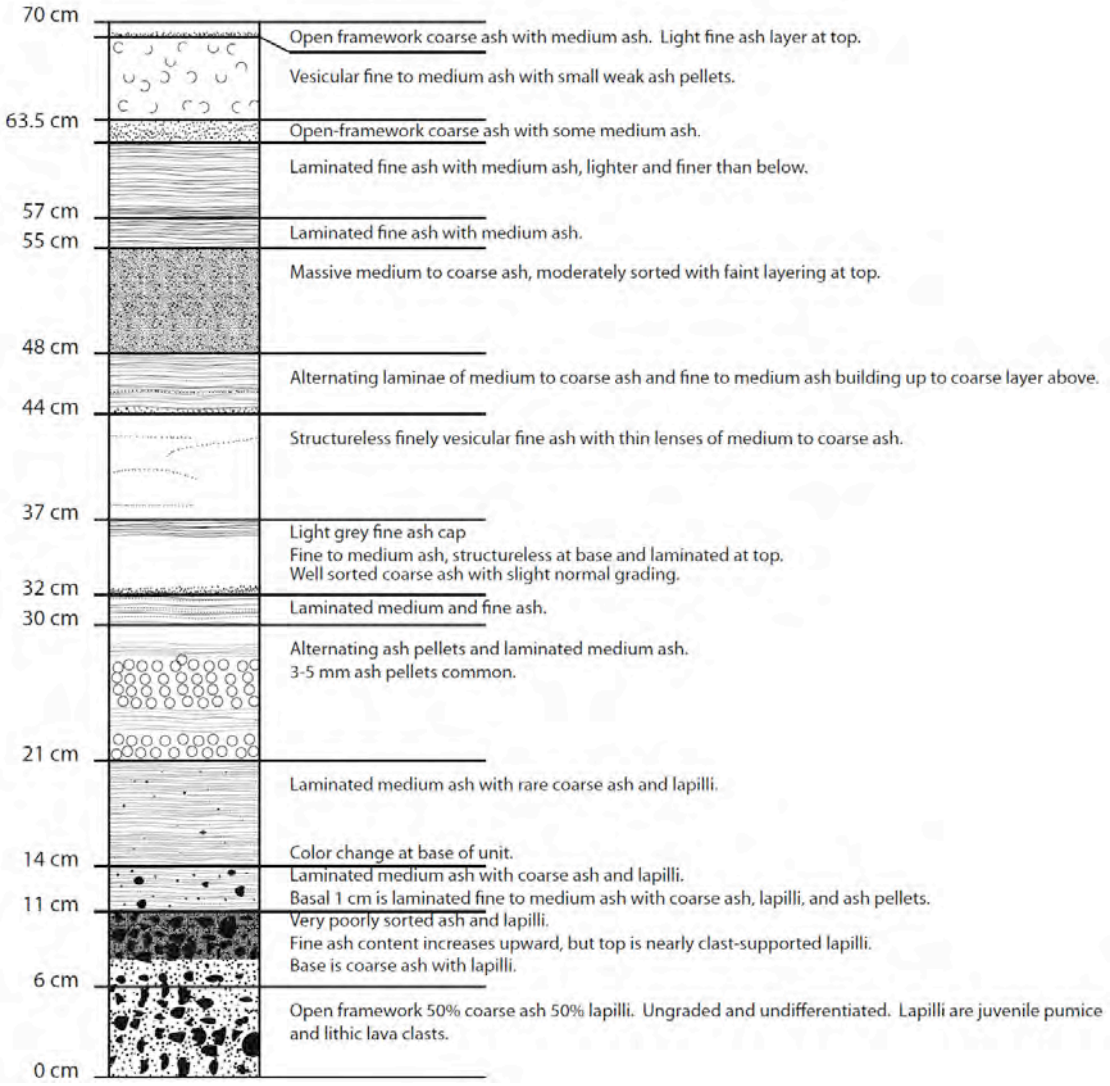
10JAUOK076

Location: Southeast caldera rim



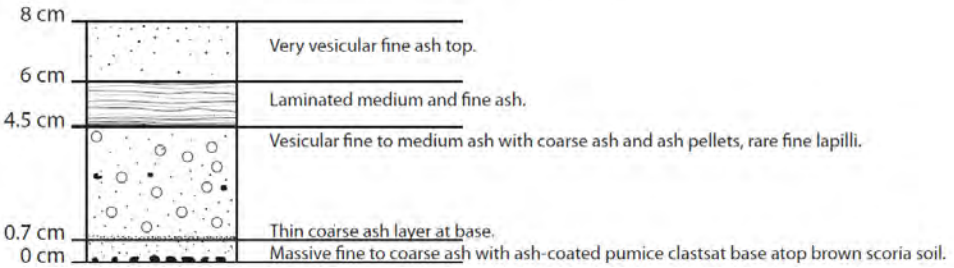
10JAUOK077

Location: Southeast caldera rim



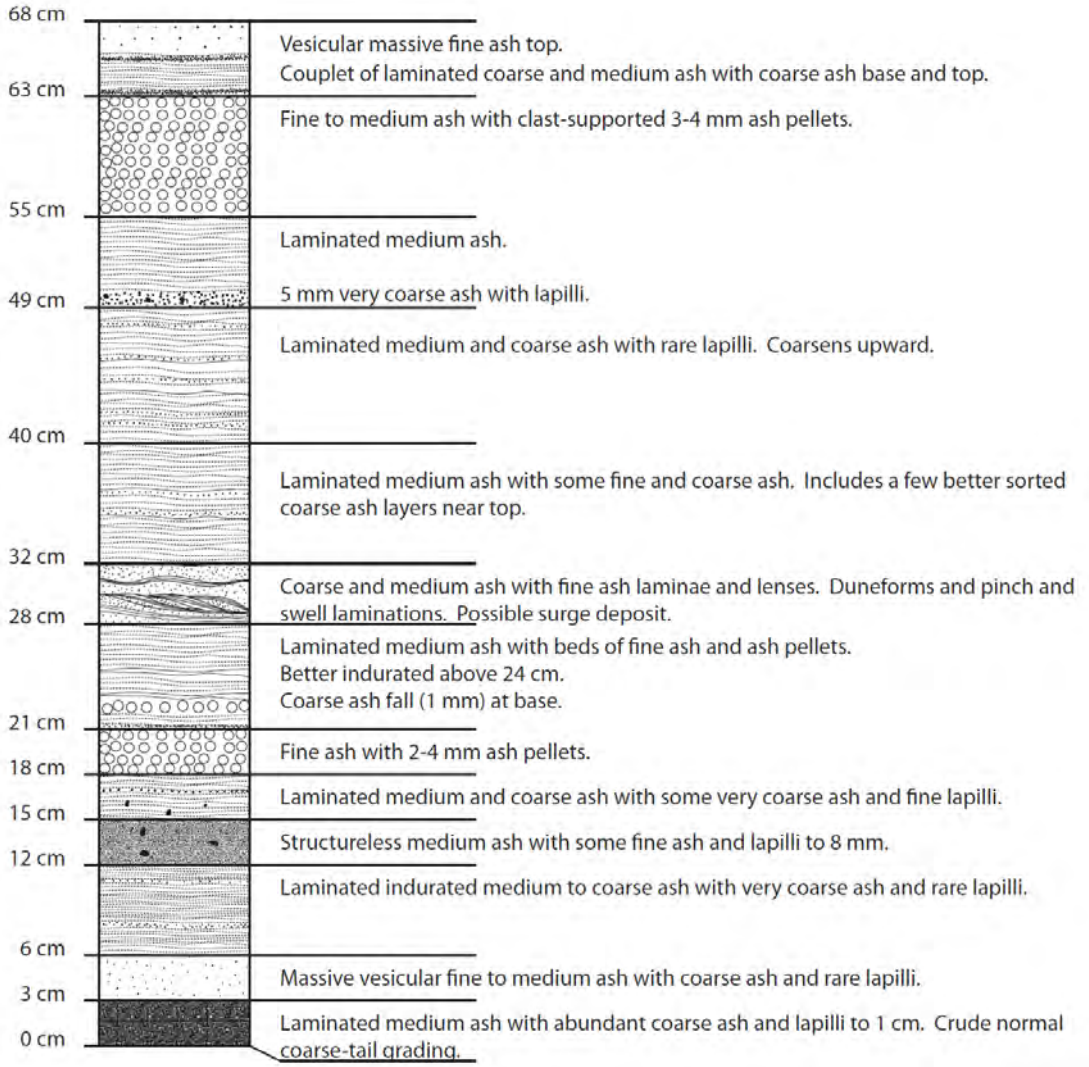
10JAUOK078

Location: Bench north of Cone B



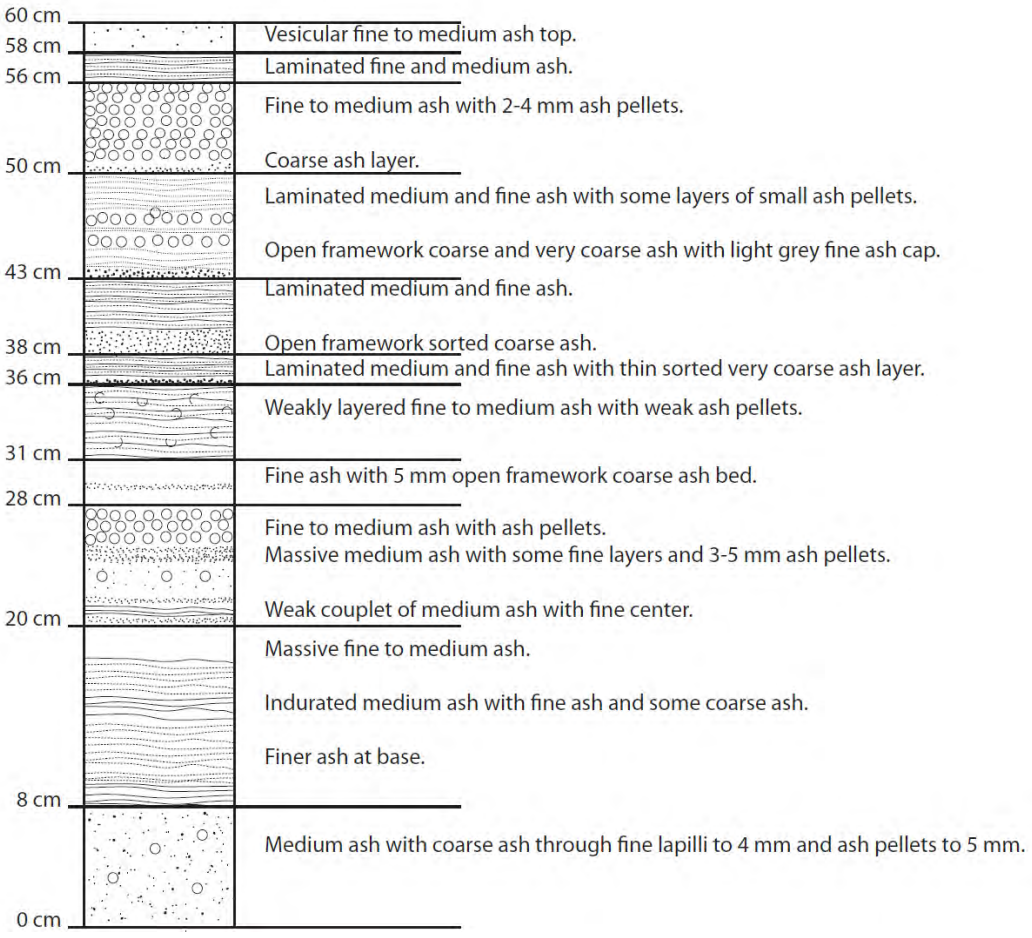
10JAUOK079

Location: Southeast caldera rim



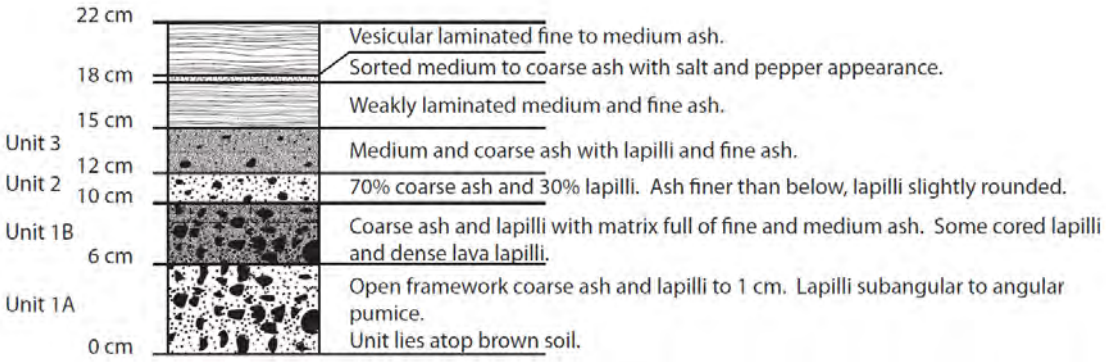
10JAUOK080

Location: Near Cone F



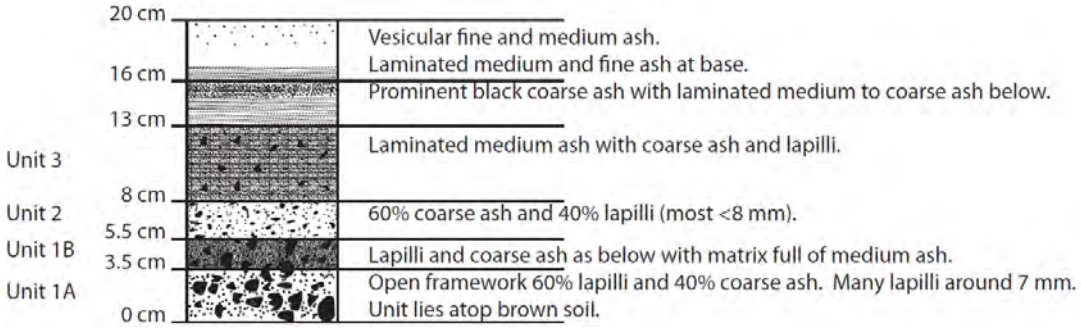
10JAUOK081

Location: Lower flanks traverse



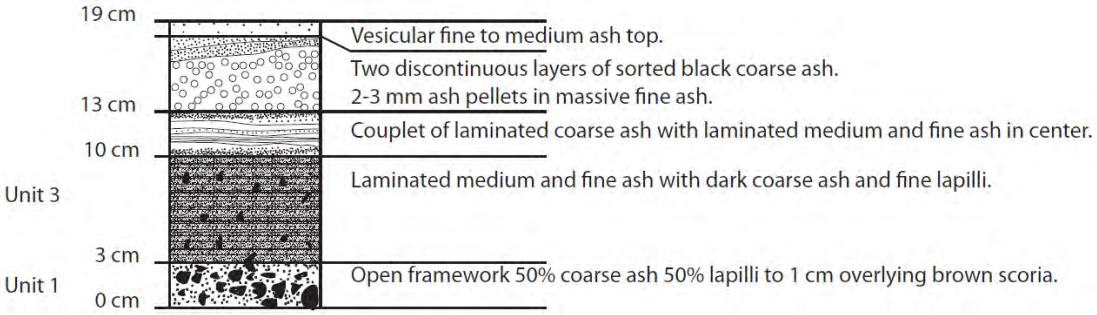
10JAUOK082

Location: Lower flanks traverse



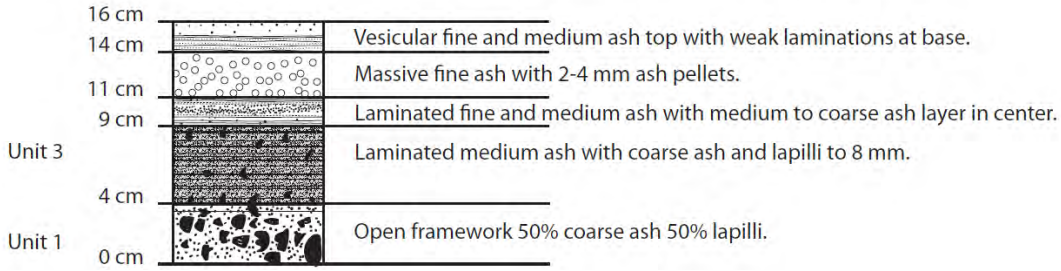
10JAUOK083

Location: Lower flanks traverse



10JAUOK084

Location: Lower flanks traverse



10JAUOK085 is 4.5 cm tephra, 0.5 cm coarse ash base and 4 cm medium ash with fine ash near top.

Appendix B: SEM images and glass geochemistry

Glass Geochemistry from Energy Dispersive Spectroscopy

	Brown Pumice			Brown Vesicular Glass			Blocky Dense Brown Glass			
011B 2-phi	1	2	3	1	2	3	1	2	3	4
Na2O	3.82	3.13	3.05	3.8	3.32	2.9	2.74	3.51	4.13	4.05
MgO	3.12	3.08	3.07	2.93	4.3	4.85	5.22	4.64	3.07	3.85
Al2O3	13.99	13.99	13.37	14.02	14.83	14.87	13.51	16.66	17.43	14.69
SiO2	56.09	52.45	51.38	53.4	55.78	52.59	50.33	52.85	56.08	56.13
P2O5	0.7	0.25	-0.12	0.19	-0.01	-0.18	0.49	-0.02	-0.12	0.01
SO3	-0.62	0.4	-0.06	-0.02	0.17	-0.03	-0.18	0.15	0.07	0.09
K2O	1.4	1.08	0.75	1.3	0.81	0.98	1.15	0.58	1	1.47
CaO	7.66	8.68	9.54	7.85	8.12	10.87	11.72	10.37	9.55	7.97
TiO2	1.59	1.86	1.7	2.06	1.1	1.71	1.39	1.3	1.2	1.28
Cr2O3	0.21	0.01	0.15	0.17	0.08	-0.3	-0.02	0.26	-0.4	-0.22
MnO	0.05	0.4	0.22	0.23	0.16	0.29	0.06	0.31	0.15	-0.16
FeO	12.01	14.67	16.92	14.51	11.38	11.64	13.31	9.29	7.85	11.08
NiO	-0.01	-0.01	0.02	-0.45	-0.03	-0.2	0.29	0.1	-0.01	-0.25

Glass Geochemistry from EDS for sample 10JAUOK011B 2-phi

	Plagioclase-rich Lava			Black Scoria		Dense Black Pyroclast		
011B 2-phi	1	2	3	1	2	1	2	3
Na2O	3.11	4.95	5.24	3.66	3.56	3.67	2.92	3.43
MgO	3.44	3.14	5.18	2.81	2.96	3.37	4.56	2.89
Al2O3	13.65	18.22	17.27	14.6	13.69	14.31	16.84	14.64
SiO2	49.97	54.17	52.38	52.49	52.99	53.18	52.51	55.24
P2O5	0.28	0.2	0.36	0.32	0.2	0.24	0.16	0.62
SO3	0.14	-0.06	0.45	0.12	0.07	0.01	-0.13	0.13
K2O	1.52	0.75	1.41	1.27	1.57	1.37	0.59	1.24
CaO	12.35	8.58	10.57	8.91	8	8.26	10.15	7.82
TiO2	1.57	1.03	0.53	1.12	1.75	1.97	1.24	1.76
Cr2O3	0.23	0.16	-0.01	0.29	0.09	0.21	0.15	0.16
MnO	-0.07	0.08	0.38	0.46	0.55	0.21	0.49	0.05
FeO	13.92	8.62	6.18	14.02	14.67	13.31	10.44	12
NiO	-0.11	0.14	0.05	-0.06	-0.1	-0.11	0.06	0.01

Glass Geochemistry from EDS for sample 10JAUOK011B 2-phi

Sample Analysis with Errors of Analysis:

Glass 1		Glass 2		Glass 3		Glass 4		Glass 5		Glass 6	
Comp %	σ	Comp %	σ	Comp %	σ	Comp %	σ	Comp %	σ	Comp %	σ
3.13	0.40	3.93	0.42	3.46	0.43	3.38	0.44	3.46	0.42	4.36	0.47
4.59	0.43	3.51	0.40	3.91	0.41	3.08	0.43	3.87	0.43	2.46	0.42
14.73	0.60	14.17	0.60	13.72	0.60	14.62	0.66	14.46	0.60	15.63	0.64
52.78	1.07	55.51	1.07	54.39	1.09	54.73	1.20	51.84	1.07	54.36	1.13
-0.21	0.40	0.58	0.39	-0.03	0.51	-0.05	0.43	0.31	0.38	0.24	0.43
0.33	0.36	0.14	0.33	0.09	0.34	0.38	0.35	0.06	0.24	0.38	0.38
0.82	0.19	1.09	0.19	1.21	0.20	1.13	0.23	0.88	0.20	1.45	0.22
10.23	0.42	7.69	0.38	7.49	0.38	8.51	0.43	10.01	0.42	8	0.39
2.07	0.35	2.26	0.35	1.83	0.35	1.64	0.35	1.99	0.35	1.65	0.33
-0.01	0.18	-0.16	0.25	0.07	0.25	-0.43	0.31	-0.17	0.26	0.24	0.27
0.12	0.29	0.48	0.27	-0.04	0.29	0.48	0.32	0.76	0.28	0.42	0.29
11.45	0.60	11.02	0.58	14.01	0.64	12.56	0.67	12.72	0.63	10.8	0.62
-0.02	0.36	-0.22	0.45	-0.11	0.45	-0.05	0.54	-0.19	0.47	0.01	0.39

Glass Geochemistry from EDS for sample 10JAUOK011E 4-phi with error of analysis shown

Sample	Glass Particle Number											
011B	2	3	4	5	7	8	9	10	11	13	14	16
Na2O	3.36	3.41	4.09	3.91	3.82	3	3.44	2.86	4.14	2.86	3.42	2.62
MgO	4.75	3.34	3.73	3.75	2.85	4.12	3.72	5.31	3.4	3.81	3.45	4.03
Al2O3	14.05	11.97	15.99	16.61	15.31	14.27	15.56	14.17	15.61	15.43	13.7	14.8
SiO2	54.03	51.81	56.55	53.35	50.83	55	56.04	51.38	53.96	48.78	54.79	52.93
P2O5	-0.01	0.37	-0.17	0.15	0.19	0.14	-0.16	-0.24	0.58	0.61	0.32	0.28
SO3	0.1	0.19	0.19	0.19	0.51	0.2	0.03	0.4	0.41	-0.11	0.28	-0.2
K2O	1.07	1.35	1.59	0.99	0.71	1.14	1.36	0.81	1.13	1	1.47	1.15
CaO	8.99	8.18	6.8	8.24	9.34	9.65	7.48	10.33	7.82	8.9	7.86	8.77
TiO2	1.32	2.14	1.28	1.56	1.98	1.4	1.15	1.68	1.54	2.09	1.15	1.59
Cr2O3	-0.07	0.32	-0.12	0.12	-0.17	0.04	-0.06	0.57	-0.16	0.4	-0.49	0.11
MnO	0.45	0.37	0.47	0.06	0.42	-0.22	0.4	-0.03	0.44	0.33	0.29	-0.13
FeO	11.79	17.19	9.52	10.9	13.72	10.94	11.01	12.55	11.33	16.05	13.47	14.55
NiO	0.18	-0.64	0.09	0.18	0.5	0.33	0.04	0.2	-0.21	-0.14	0.29	-0.51

Glass Geochemistry from EDS for sample 10JAUOK011B 4-phi

Sample	Glass Particle Number						
011C	1	2	3	4	5	6	7
Na2O	3.41	4.36	3.42	4.19	3.81	4.65	3.52
MgO	7.77	3.75	5.51	4.57	2.96	3.7	3.28
Al2O3	12.37	15.13	14.06	13.15	17.97	15.83	14.81
SiO2	51.86	55.55	53.8	52.42	57.78	57.6	54.95
P2O5	0.82	-0.41	-0.19	-0.08	0.39	0.52	0
SO3	-0.4	0.23	0.37	-0.07	-0.07	0.3	0.06
K2O	0.82	0.54	1.08	1.56	1.01	1.36	1
CaO	9.13	8.27	8.21	8.63	8.2	6.47	9.05
TiO2	1.18	1.46	1.43	1.29	1.21	0.97	1.91
Cr2O3	-0.16	0.5	0.38	-0.22	-0.08	0.4	0.28
MnO	0.2	0	0.21	0.28	0.08	-0.12	0.15
FeO	13.45	10.77	12.13	13.99	6.84	8.51	11.59
NiO	-0.47	-0.14	-0.41	0.29	-0.09	-0.19	-0.6

Glass Geochemistry from EDS for sample 10JAUOK011C 4-phi

Sample	Glass Particle Number					Sample	Glass Particle Number					
011D	1	2	3	4	5	011E	1	2	3	4	5	6
Na2O	2.08	2.1	2.9	2.55	3.63	Na2O	3.13	3.93	3.46	3.38	3.46	4.36
MgO	5.04	5.43	3.6	4.27	3.47	MgO	4.59	3.51	3.91	3.08	3.87	2.46
Al2O3	10.51	13.31	16.33	14.68	16.79	Al2O3	14.73	14.17	13.72	14.62	14.46	15.63
SiO2	48.18	50.98	53.65	50.36	52.67	SiO2	52.78	55.51	54.39	54.73	51.84	54.36
P2O5	0.03	-0.13	0.4	-0.21	0.23	P2O5	-0.21	0.58	-0.03	-0.05	0.31	0.24
SO3	-0.06	0.13	-0.02	0.1	-0.15	SO3	0.33	0.14	0.09	0.38	0.06	0.38
K2O	1.04	0.88	0.63	0.87	0.71	K2O	0.82	1.09	1.21	1.13	0.88	1.45
CaO	11.58	11.84	10.23	12.36	10.99	CaO	10.23	7.69	7.49	8.51	10.01	8
TiO2	2.09	1.61	1.81	1.67	1.18	TiO2	2.07	2.26	1.83	1.64	1.99	1.65
Cr2O3	-0.09	0.01	-0.44	-0.2	-0.03	Cr2O3	-0.01	-0.16	0.07	-0.43	-0.17	0.24
MnO	0.7	-0.13	0.31	0.2	0.13	MnO	0.12	0.48	-0.04	0.48	0.76	0.42
FeO	19.23	13.91	10.54	13.38	9.86	FeO	11.45	11.02	14.01	12.56	12.72	10.8
NiO	-0.31	0.06	0.06	0	0.52	NiO	-0.02	-0.22	-0.11	-0.05	-0.19	0.01

Glass Geochemistry from EDS for samples 10JAUOK011D-E 4-phi

Sample	Glass Particle Number					Sample	Glass Particle Number				
011F	1	2	3	4	5	074B	1	2	3	4	5
Na2O	3.04	3.37	3.17	3.72	3.34	Na2O	3.87	2.8	3.7	2.97	3.33
MgO	2.86	2.51	2.32	2.89	3.27	MgO	2.82	2.03	3.73	3.01	6.19
Al2O3	13.1	12.53	13.37	15.6	13.5	Al2O3	12.51	13.46	13.81	12.28	14.09
SiO2	55.95	50.82	52.39	58.42	56.27	SiO2	58.74	53.81	57.81	58.87	54.61
P2O5	0.23	0.66	-0.24	0.19	0.19	P2O5	0.42	0.32	0.07	0.22	-0.14
SO3	0.12	0.07	0.02	-0.02	0.2	SO3	-0.04	-0.03	-0.03	-0.05	0.08
K2O	1.65	1.61	1.41	1.07	1.39	K2O	1.8	1.21	1.53	1.32	0.61
CaO	7.79	9.1	9.3	7.78	6.99	CaO	6.54	8.59	6.45	6.98	9.02
TiO2	1.98	1.83	2.8	1.23	1.75	TiO2	1.89	2.37	1.54	1.57	1.16
Cr2O3	-0.2	0.43	0.07	-0.19	-0.15	Cr2O3	-0.05	-0.39	-0.2	0	0.28
MnO	0.16	0.43	0.31	0.02	0.28	MnO	0.23	-0.14	0.3	0.63	0.59
FeO	13.47	17.19	15.31	9.49	12.75	FeO	10.87	15.86	11.36	12.31	10.2
NiO	-0.16	-0.55	-0.23	-0.22	0.23	NiO	0.4	0.11	-0.07	-0.1	-0.02

Glass Geochemistry for samples 10JAUOK011F and 10JAUOK074B 4-phi

Sample	Glass Particle Number								
074A	1	2	3	4	5	6	7	8	9
Na2O	4.56	3.79	3.58	2.95	5.6	3.3	6.19	3.35	2.59
MgO	2.35	2.39	2.4	2.94	0.71	1.04	3.32	4.5	6.67
Al2O3	15.51	15.06	14.26	17.31	18.84	12.73	16.7	11.67	14.35
SiO2	57.15	53.22	57.62	48.37	65.1	64.46	52.5	50.29	53.87
P2O5	-0.17	-0.37	0.26	-0.17	0.26	0.57	0.34	0.67	0
SO3	0.34	0.04	0.23	0.49	-0.2	0.27	0.07	0.15	-0.13
K2O	1.13	1.41	2.22	1.46	1.64	3.19	1.39	1.43	0.72
CaO	7.6	9.73	6.63	11.54	4.96	3.85	8.54	9.93	10.11
TiO2	1.57	1.94	1.65	1.97	0.18	1.66	1.33	1.66	1.47
Cr2O3	-0.06	-0.38	-0.27	-0.23	0.33	0.2	0.07	-0.19	0.49
MnO	0.37	-0.12	0.02	-0.01	-0.11	0.06	0.36	0.75	-0.01
FeO	9.79	13.63	11.14	13.3	2.79	8.36	9.28	16.41	10.1
NiO	-0.15	-0.35	0.26	0.07	-0.11	0.31	-0.1	-0.62	-0.23

Glass Geochemistry from EDS for sample 10JAUOK074A 4-phi

Sample	Glass Particle Number						
005E	1	2	3	4	5	6	15
Na2O	3.66	3.41	3	3.62	3.88	4.31	2.63
MgO	3.01	2.65	3.5	5.71	2.65	3.1	3.46
Al2O3	13.76	12.64	13.06	13.28	14.47	13.86	14.33
SiO2	52.72	44.32	56.38	55.03	56.37	55.44	51.67
P2O5	0.42	0.54	0.23	-0.39	0.21	0.7	-0.02
SO3	-0.32	-0.37	0.11	-0.13	0.43	0.14	0.83
K2O	1.15	0.95	1.38	0.68	1.2	1.25	1
CaO	9.61	9.93	7.5	8.99	7.61	7.47	11.14
TiO2	1.35	2.5	1.79	1.75	1.63	1.75	1.13
Cr2O3	0.09	-0.45	0.03	0.03	-0.02	-0.17	-0.47
MnO	-0.19	0.07	0.72	0.33	0.32	0.2	0.21
FeO	14.83	23.71	12.34	11.31	11.33	12.01	14
NiO	-0.09	0.1	-0.04	-0.21	-0.06	-0.07	0.07

Glass Geochemistry from EDS for sample 10JAUOK005E 4-phi

Sample	Glass Particle Number					Sample		Glass Particle Number			
005F	1	2	3	4	5	005G	1	2	3	4	5
Na2O	3.07	4.16	4.83	3.11	3.27	Na2O	4.52	4.17	3.87	2.32	3.8
MgO	3.59	3.51	3.84	4.26	3.65	MgO	1.74	3.42	2.69	2.54	2.56
Al2O3	13.82	14.73	13.86	17.02	13.46	Al2O3	17.69	14.86	15.68	13.87	15.73
SiO2	53.62	56.3	53.33	52.96	54.63	SiO2	57.21	58.76	57.56	50.32	54.24
P2O5	0.33	0.44	0.19	0.2	0.39	P2O5	-0.17	0.47	-0.06	0.34	0.53
SO3	-0.01	0.11	0.29	0.05	-0.13	SO3	0.25	0.06	0.21	-0.14	0.14
K2O	1.04	1.15	1.31	0.82	1.16	K2O	1.13	1.25	1.21	0.91	1.23
CaO	8.81	6.81	8.61	10.76	8.85	CaO	7.79	5.9	8.08	11.38	7.72
TiO2	1.95	1.28	1.59	1.32	1.53	TiO2	1.18	1.33	1.16	2.5	1.71
Cr2O3	0.35	0.13	-0.12	-0.29	-0.06	Cr2O3	0.1	-0.15	-0.1	0.12	-0.13
MnO	-0.28	-0.11	0.1	-0.03	0.24	MnO	0.26	0.29	0.05	0.18	0.44
FeO	13.89	11.52	12.56	9.87	12.9	FeO	8.08	9.69	9.53	15.26	12.03
NiO	-0.16	-0.04	-0.39	-0.05	0.11	NiO	0.21	-0.04	0.11	0.41	-0.01

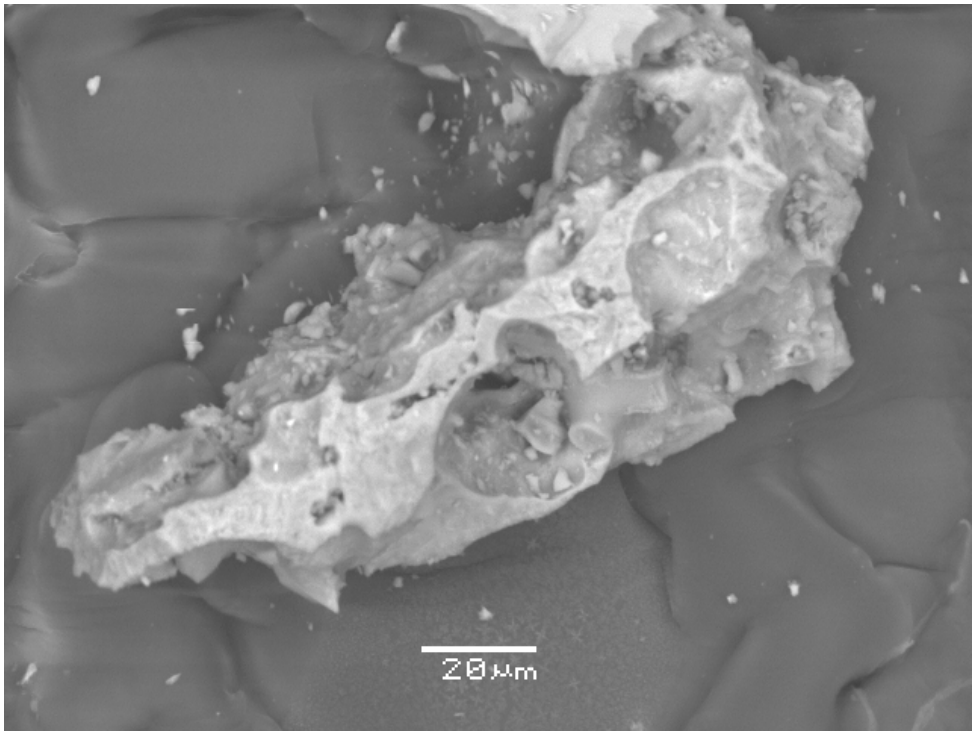
Glass Geochemistry from EDS for samples 10JAUOK005F-G 4-phi

Mineral Geochemistry from Energy Dispersive Spectroscopy

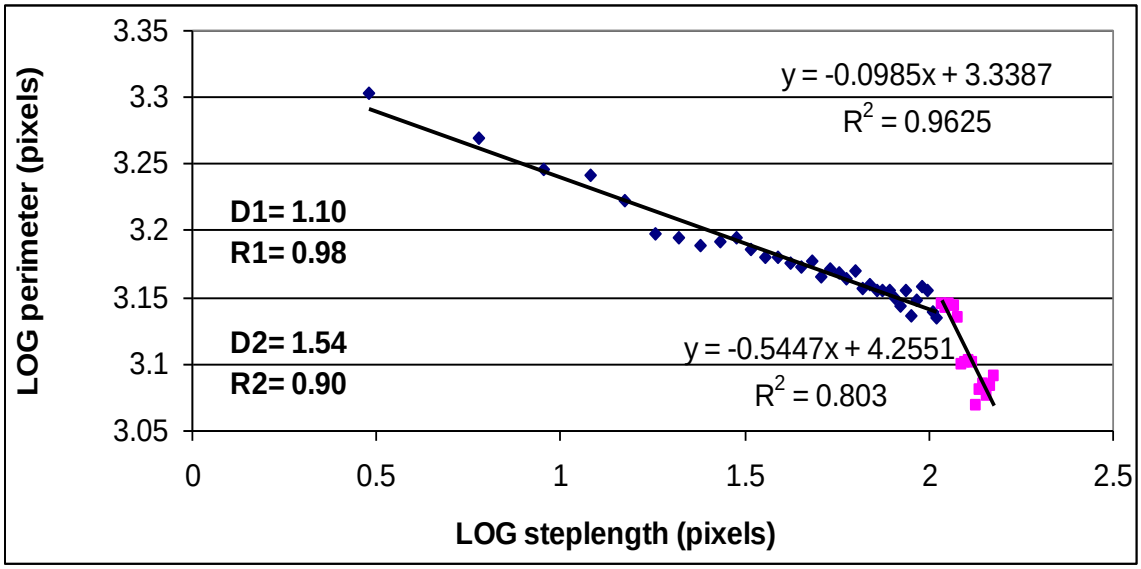
	Feldspar			Olivine		Hornblende	
Sample	**011B 2-phi**	**011B 2-phi**	**011B 4-phi**	**011B 2-phi**	**011B 4-phi**	**011B 2-phi**	**011B 2-phi**
Na2O	0.66	1.65	1.76	1.59	0.28	0.3	0.74
MgO	1.05	0.58	0.35	21.86	36.5	9.63	17.49
Al2O3	28.71	29.35	31.04	7.46	2.34	2.92	3.43
SiO2	42.66	46.83	47.66	44.87	41.19	63.17	53.41
P2O5	0.05	-0.1	-0.17	0.2	0.01	-0.33	0.14
SO3	0.57	-0.09	-0.43	-0.1	0.26	0.31	0.13
K2O	0.72	0.11	0.35	0.39	-0.1	-0.04	-0.21
CaO	21.56	18.09	17.74	3.67	1.09	16.17	17.63
TiO2	0.98	0.31	-0.37	0.56	0.23	0.26	0.7
Cr2O3	0.23	0.38	0.15	0.06	0.03	0.45	0.18
MnO	0.43	-0.07	0.05	0.01	-0.1	0.76	0.32
FeO	2.08	2.81	1.8	19.68	18.05	6.18	5.69
NiO	0.3	0.14	0.07	-0.27	0.21	0.21	0.34

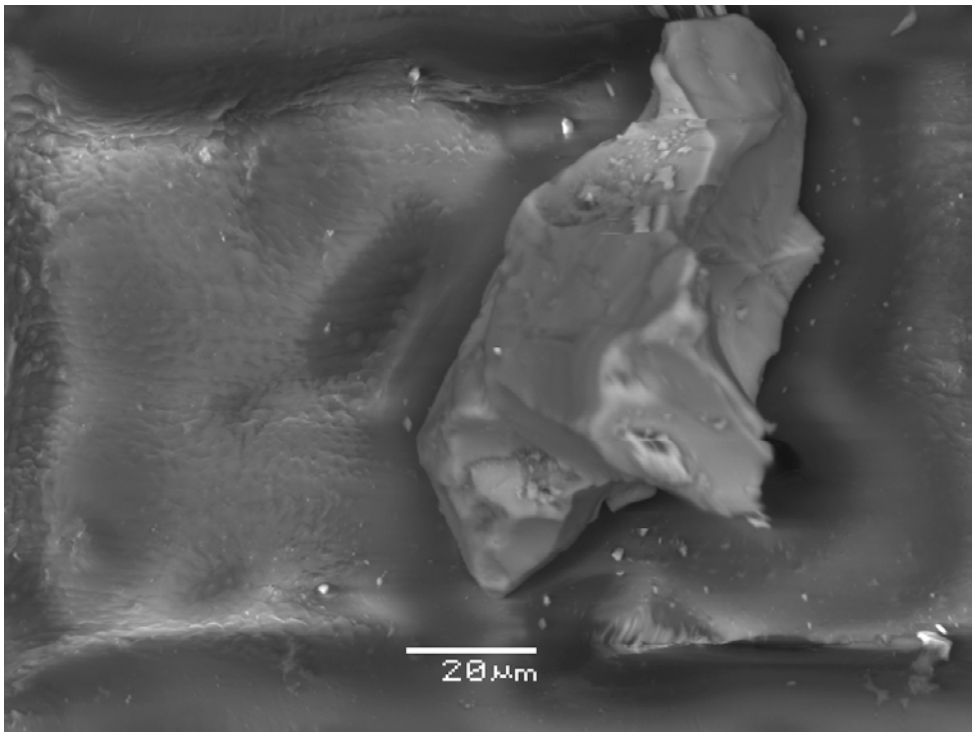
Selected SEM images

Multi-fractal particles

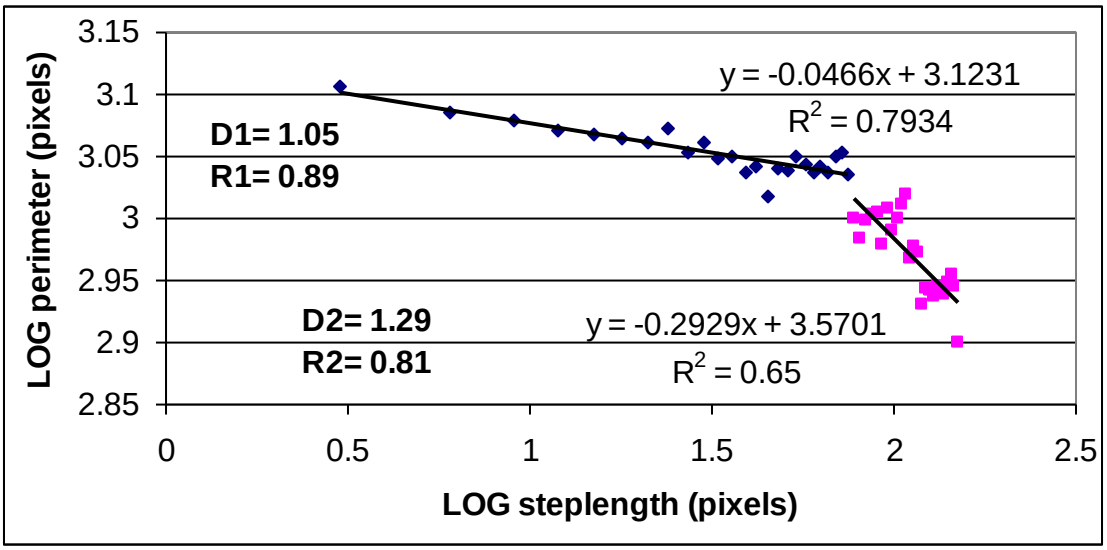


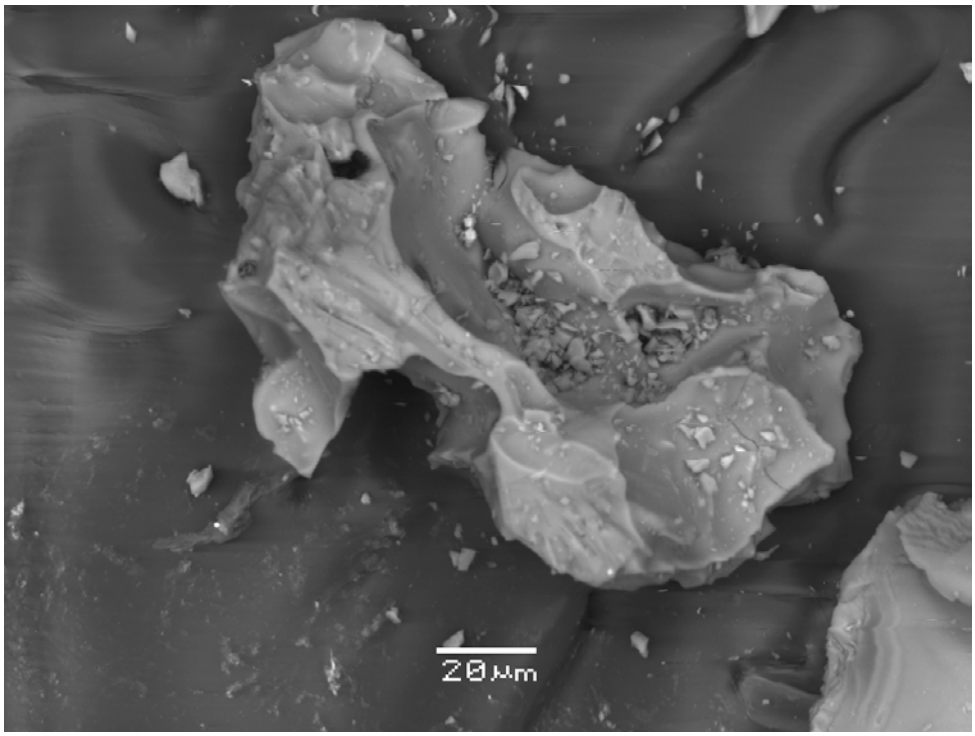
10JAUOK011A 4-phi: Particle 2



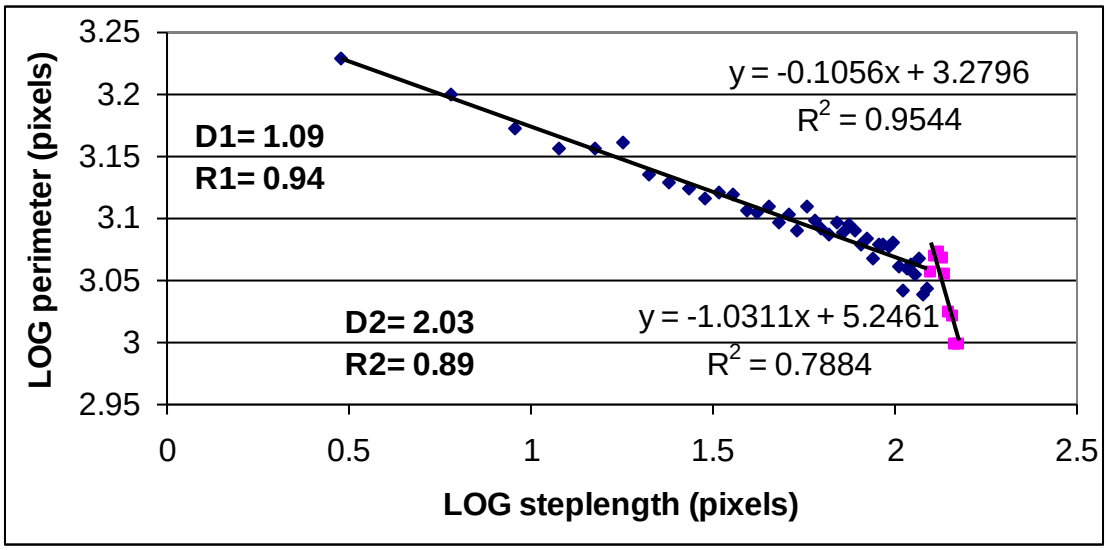


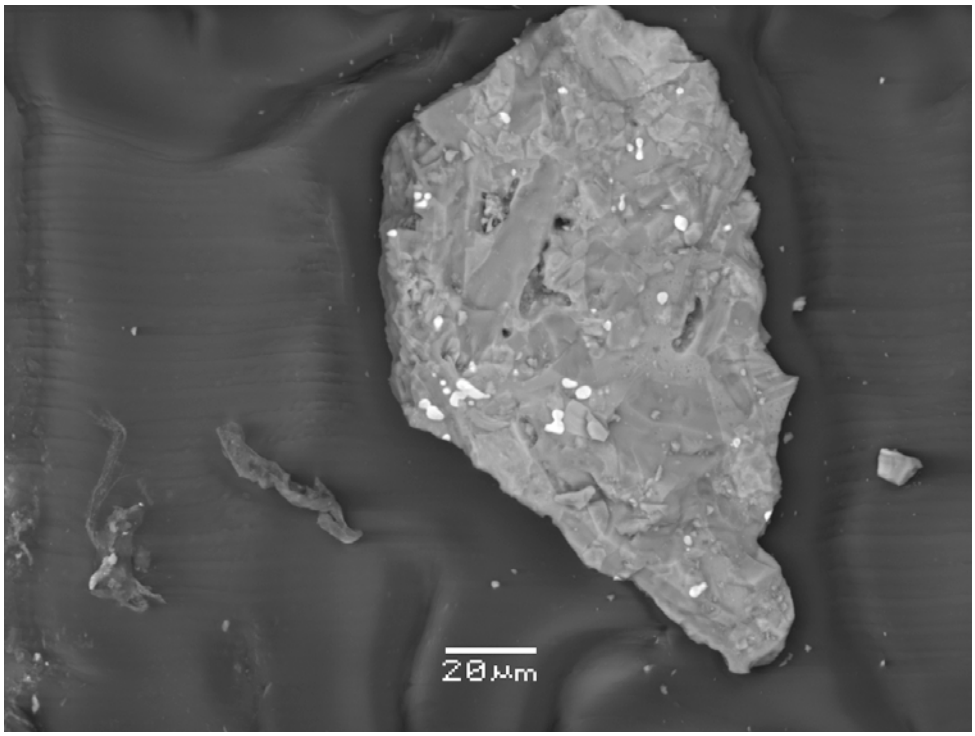
10JAUOK011A 4-phi: Particle m15



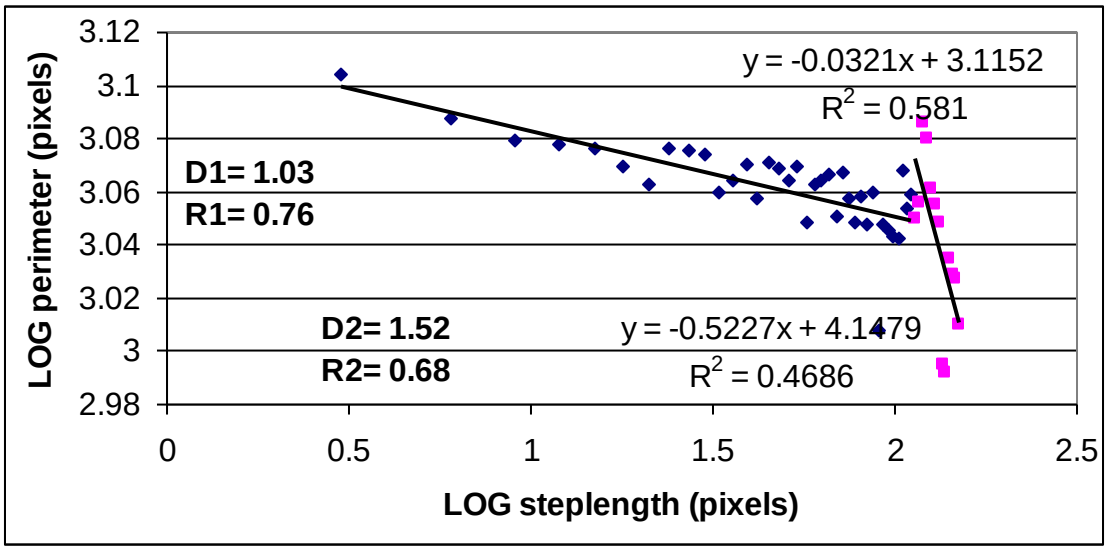


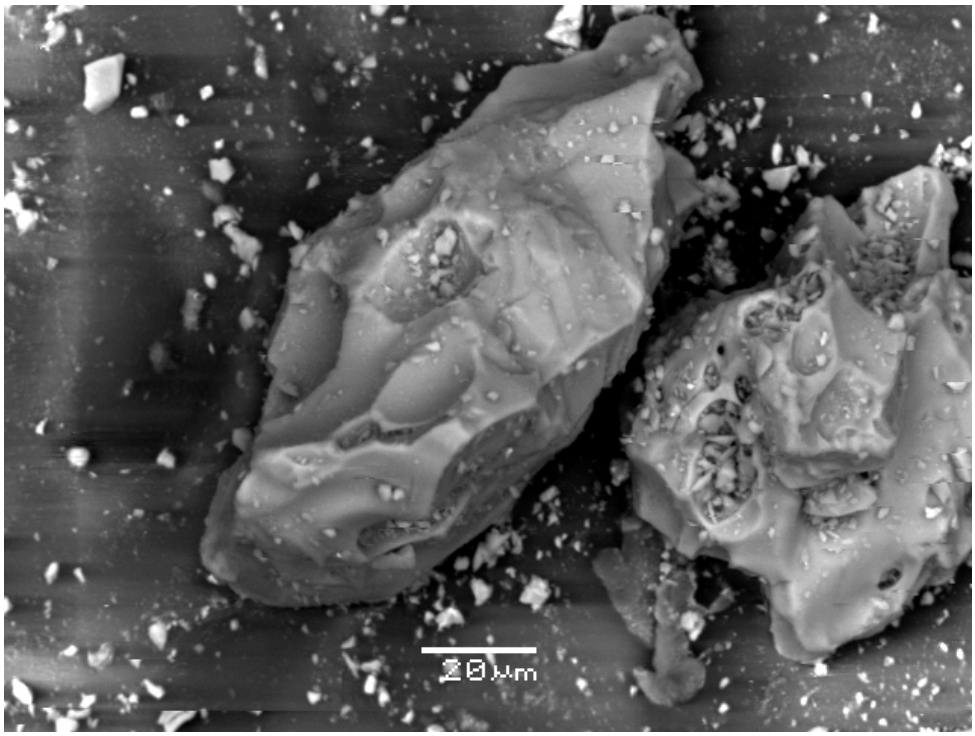
10JAUOK011A 4-phi: Particle m6



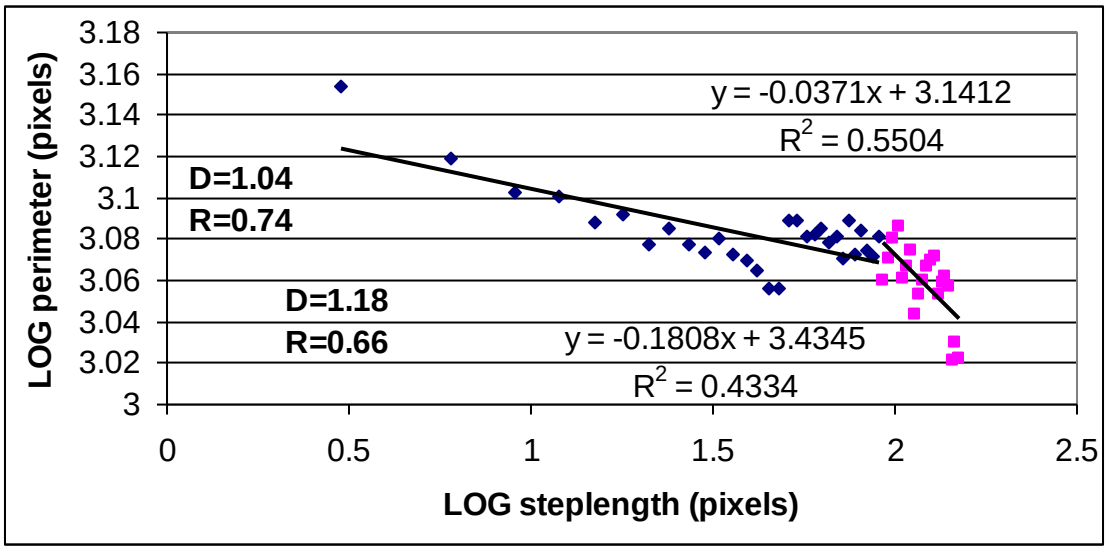


10JAUOK011A 4-phi: Particle m2

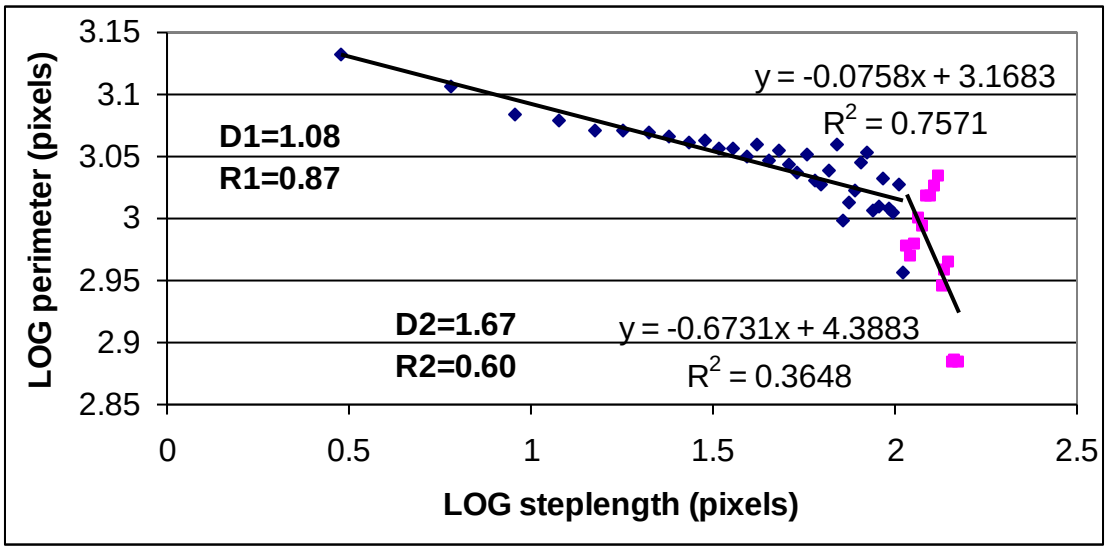


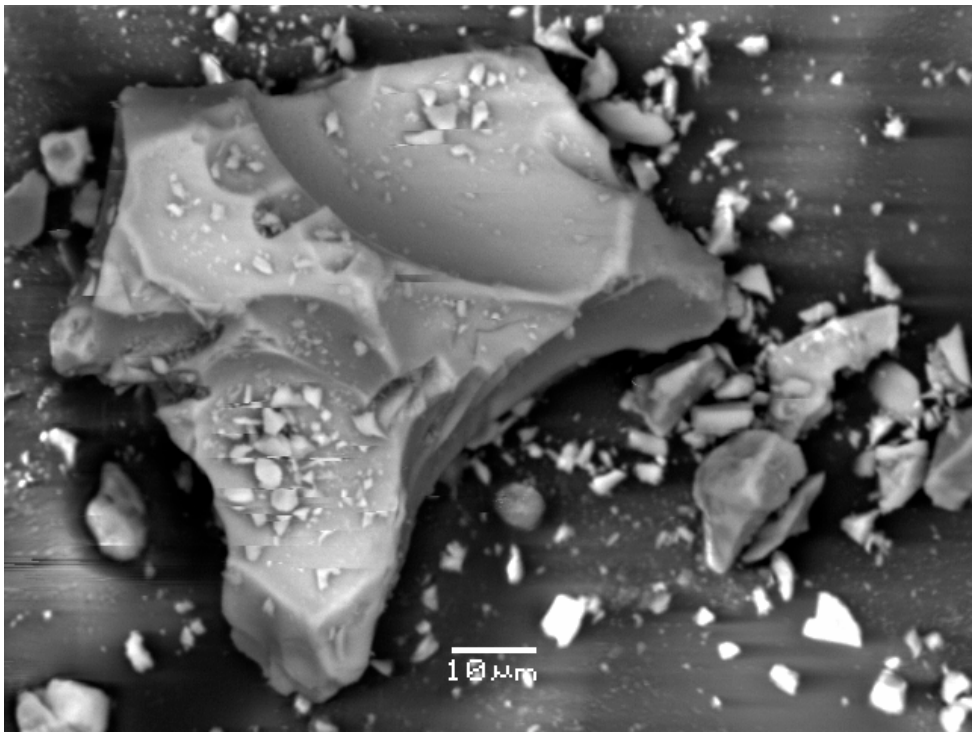


10JAUOK011D 4-phi: Glass Particle 3

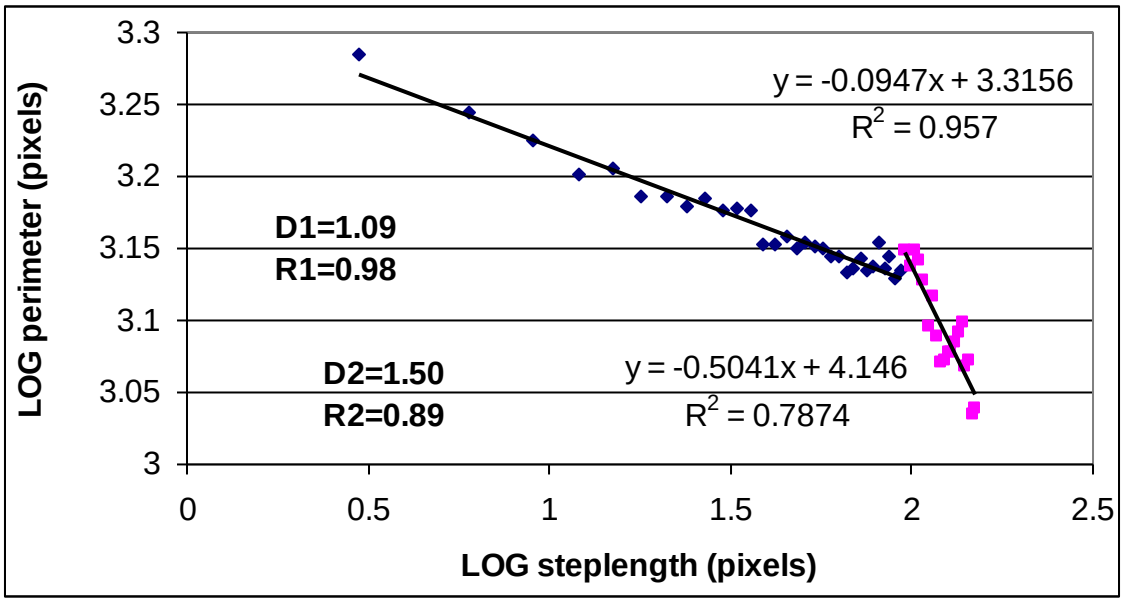


10JAUOK011D 4-phi: Glass Particle 10

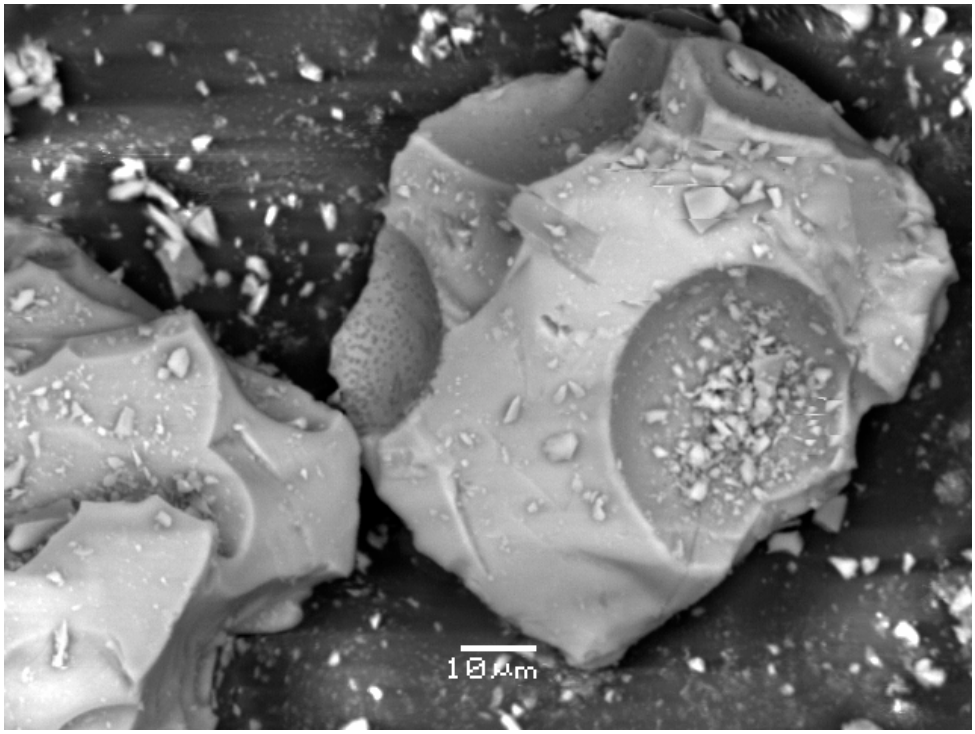




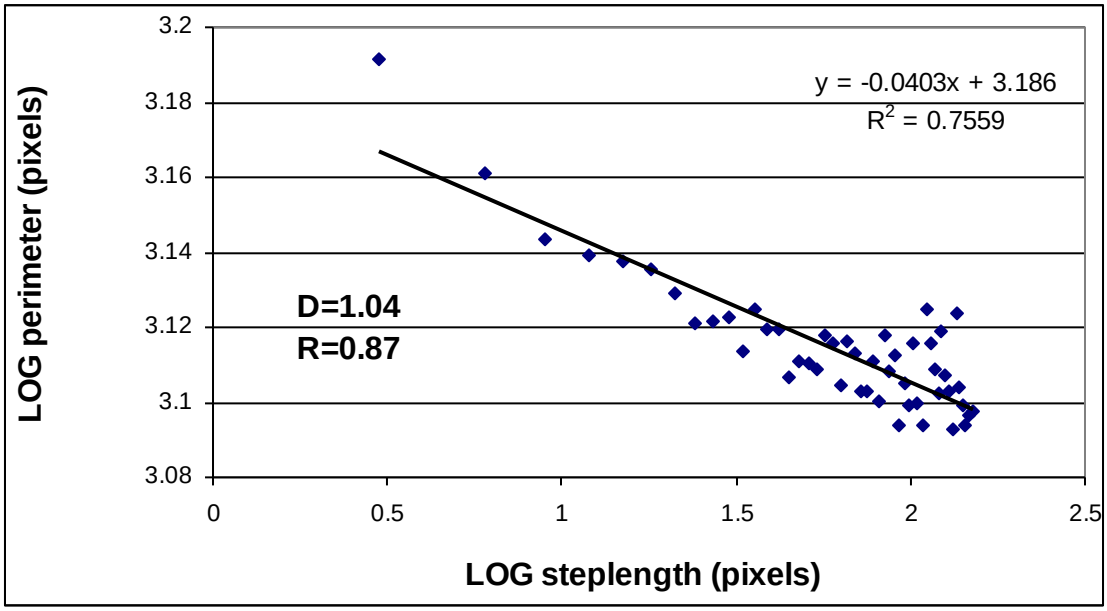
10JAUOK011D 4-phi: Glass Particle 16

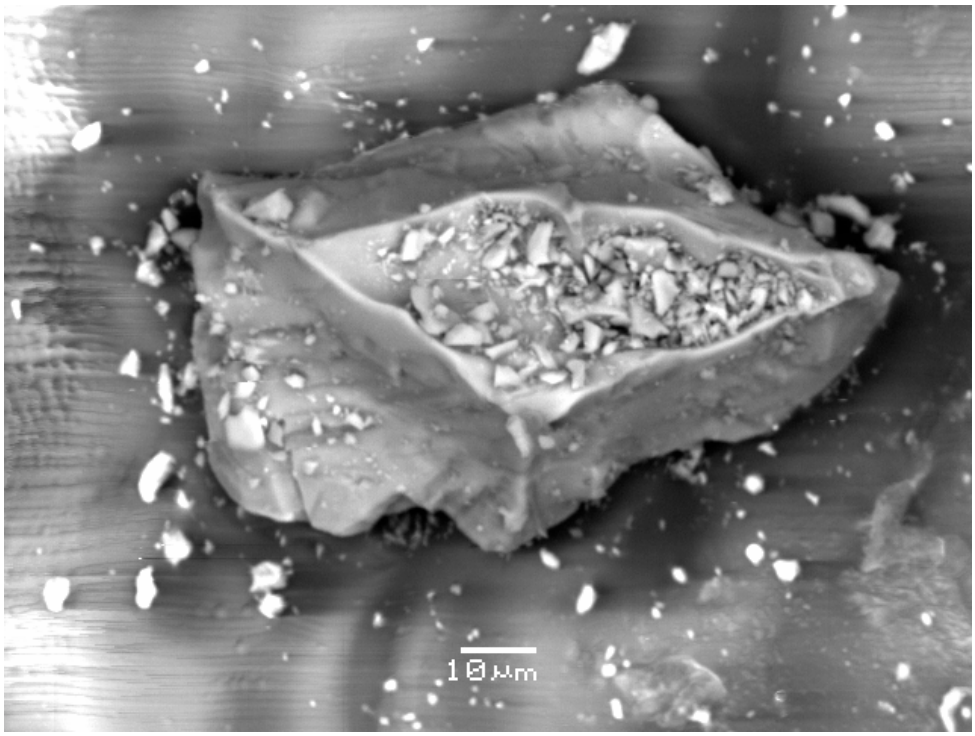


Monofractal particles with low fractal dimension (D<1.06)

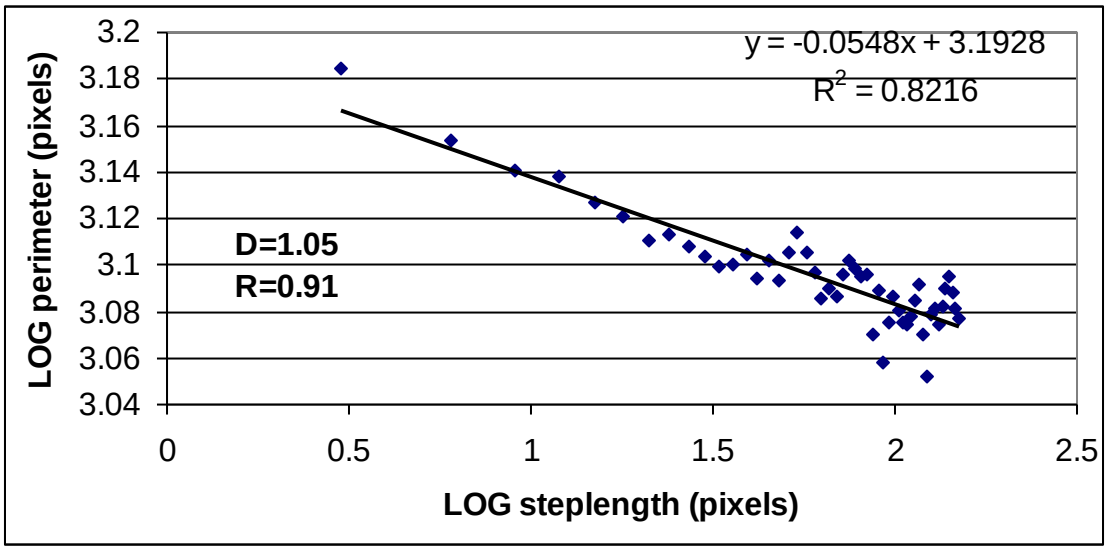


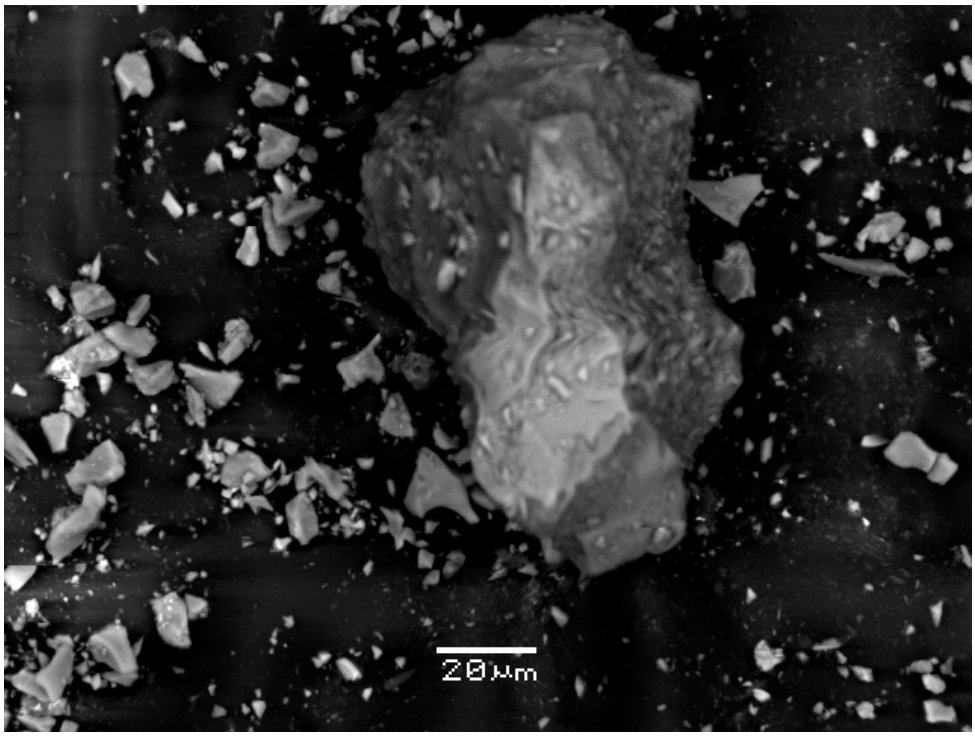
10JAUOK011D 4-phi: Glass Particle 12



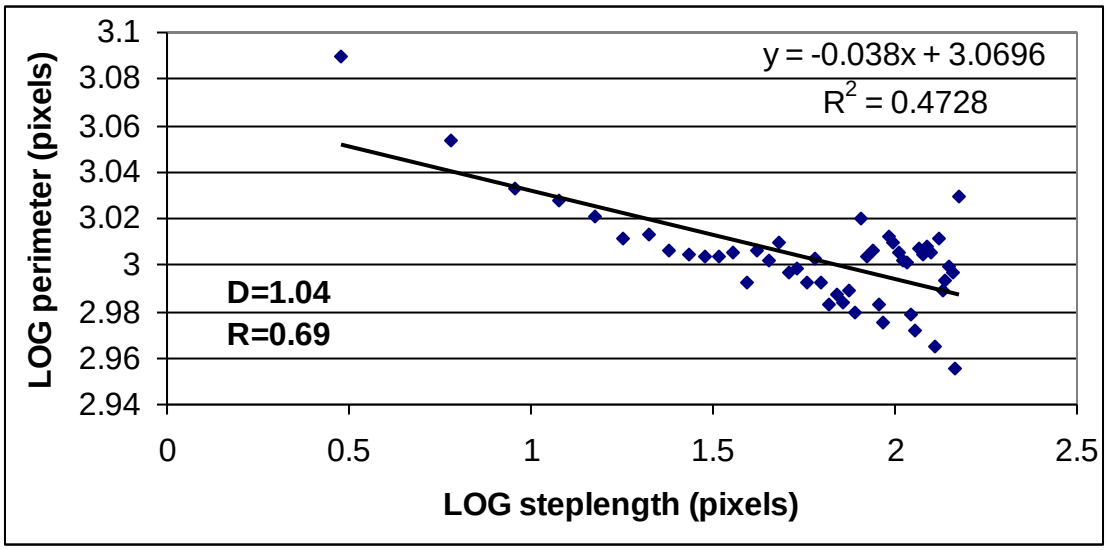


10JAUOK074A 4-phi: Glass Particle 3

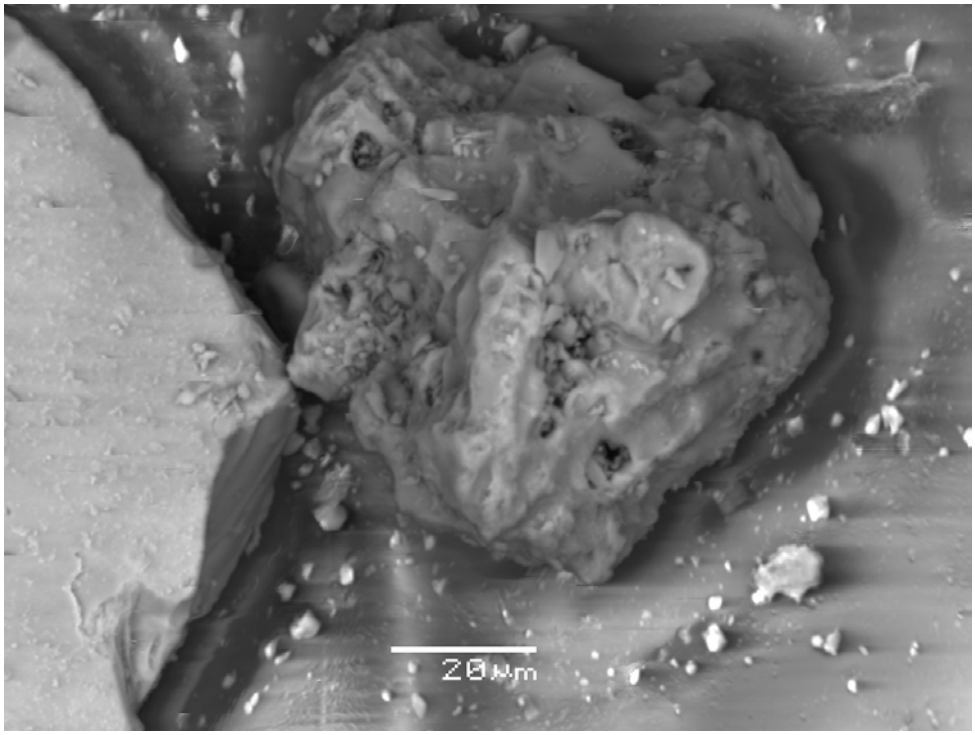




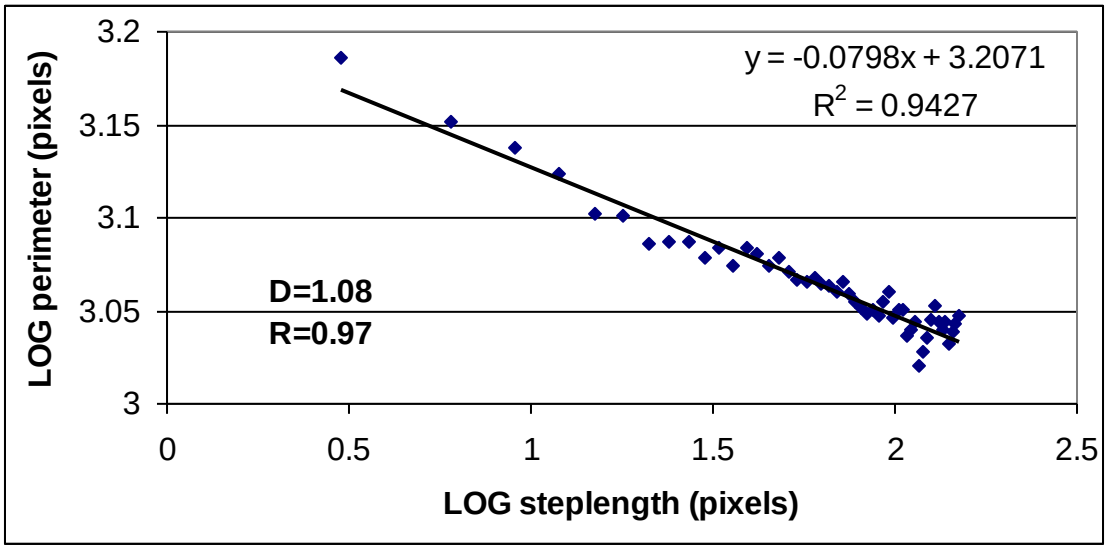
10JAUOK011E 4-phi: Glass Particle 10

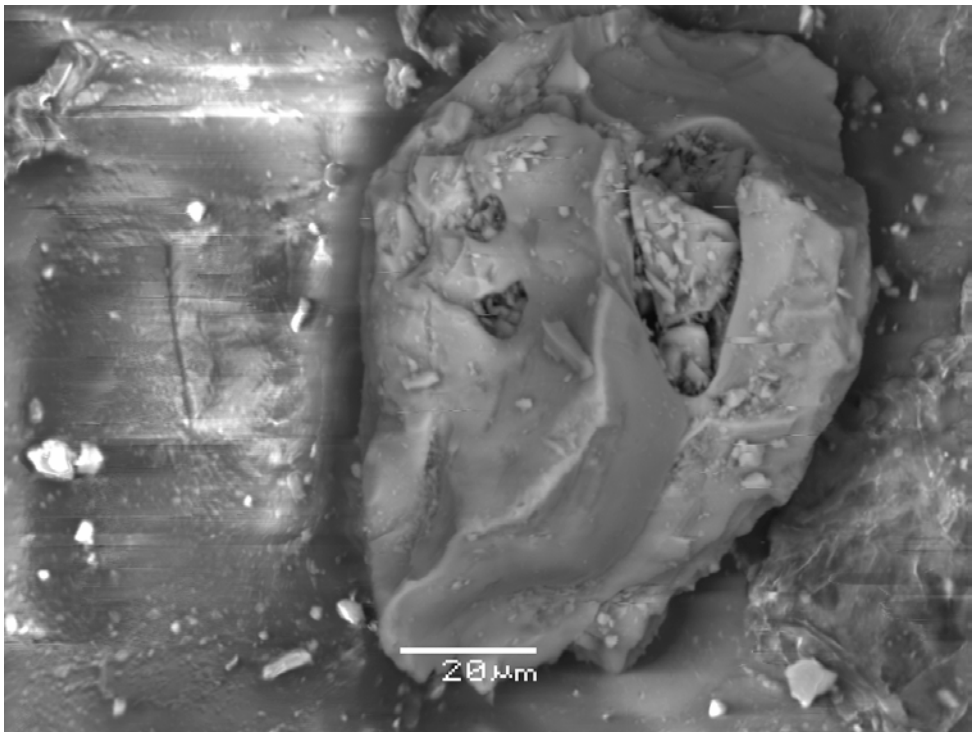


Monofractal particles with intermediate fractal dimension (1.06<D<1.09)

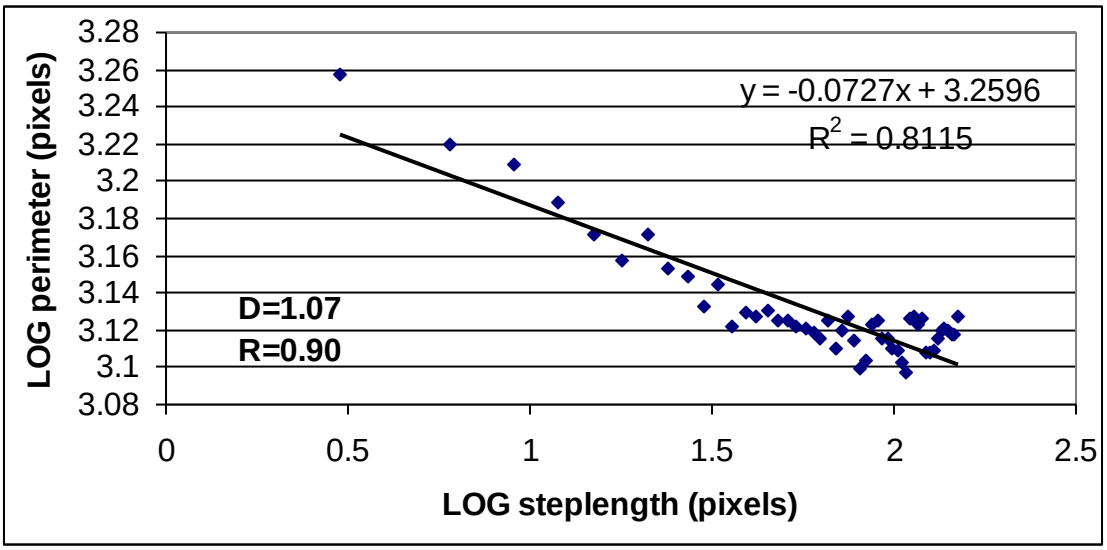


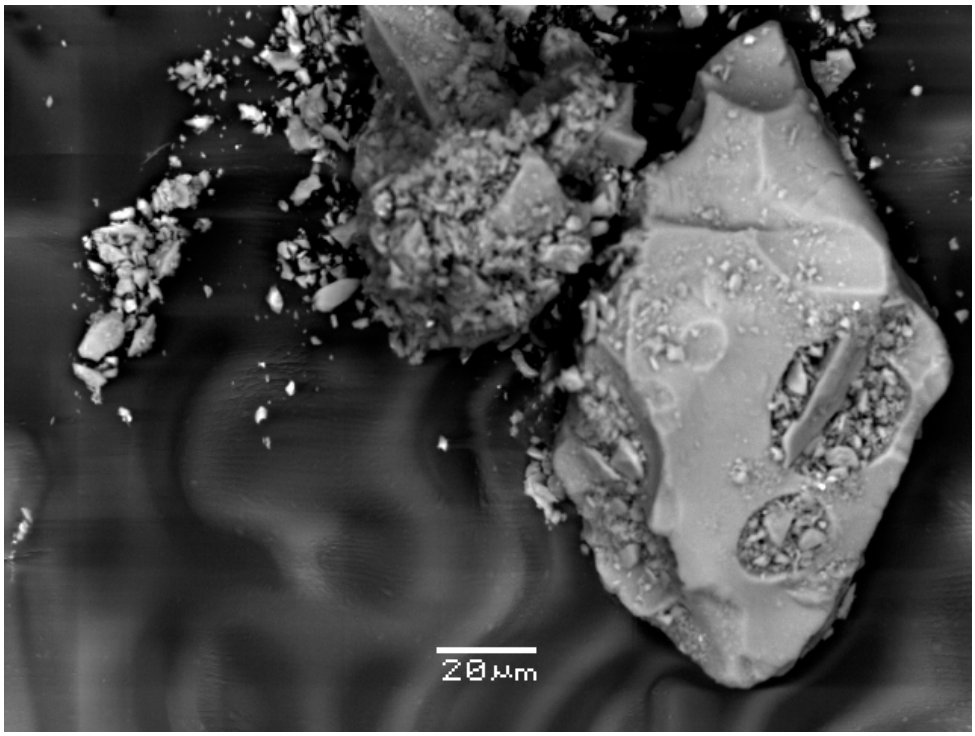
10JAUOK011C 4-phi: Glass Particle 3



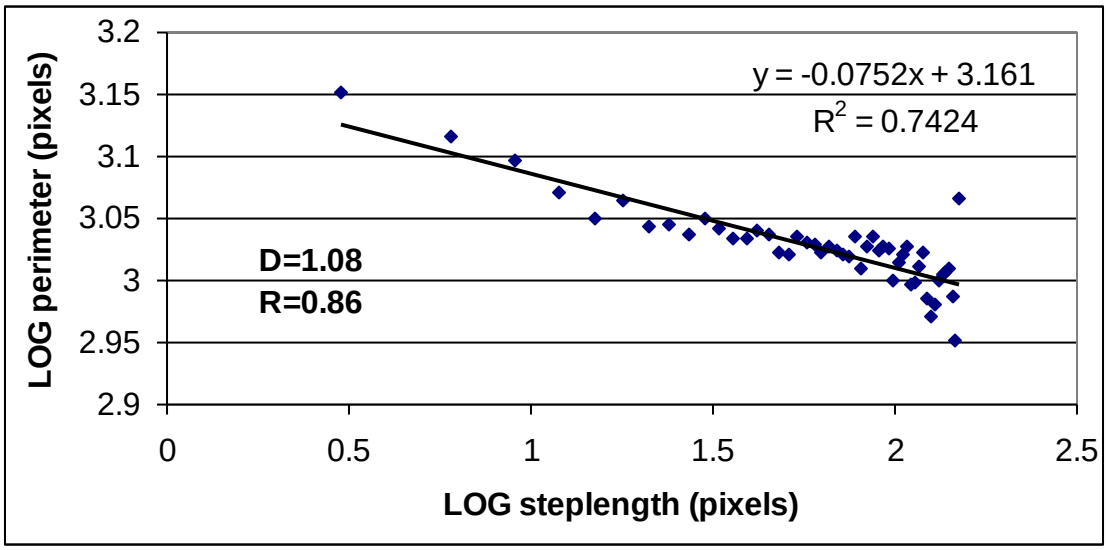


10JAUOK011C 4-phi: Glass Particle 5

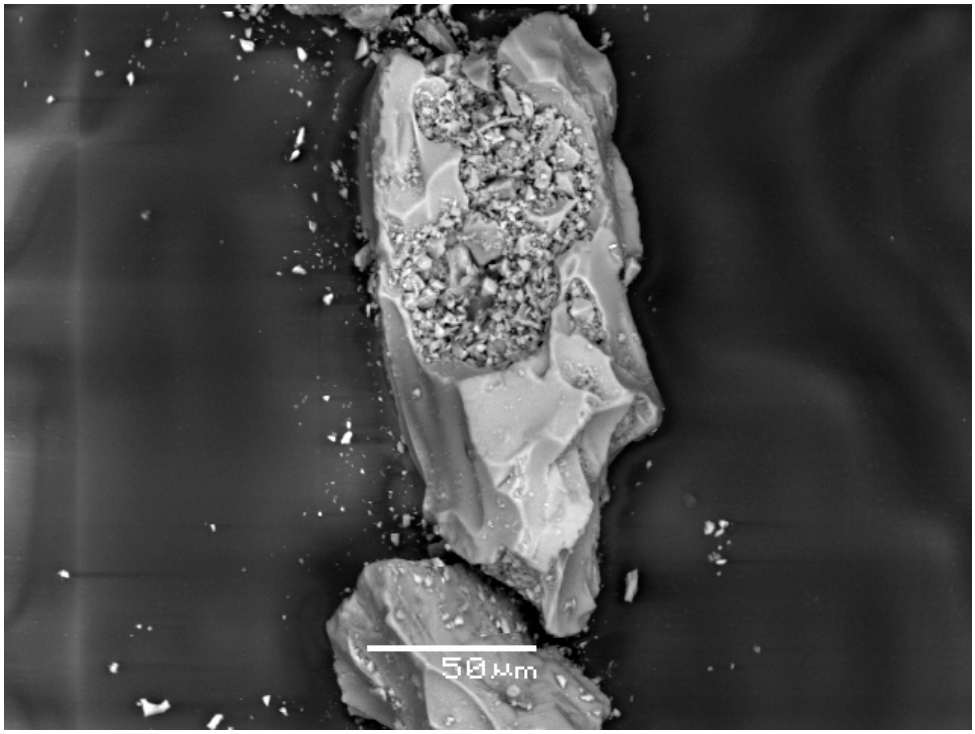




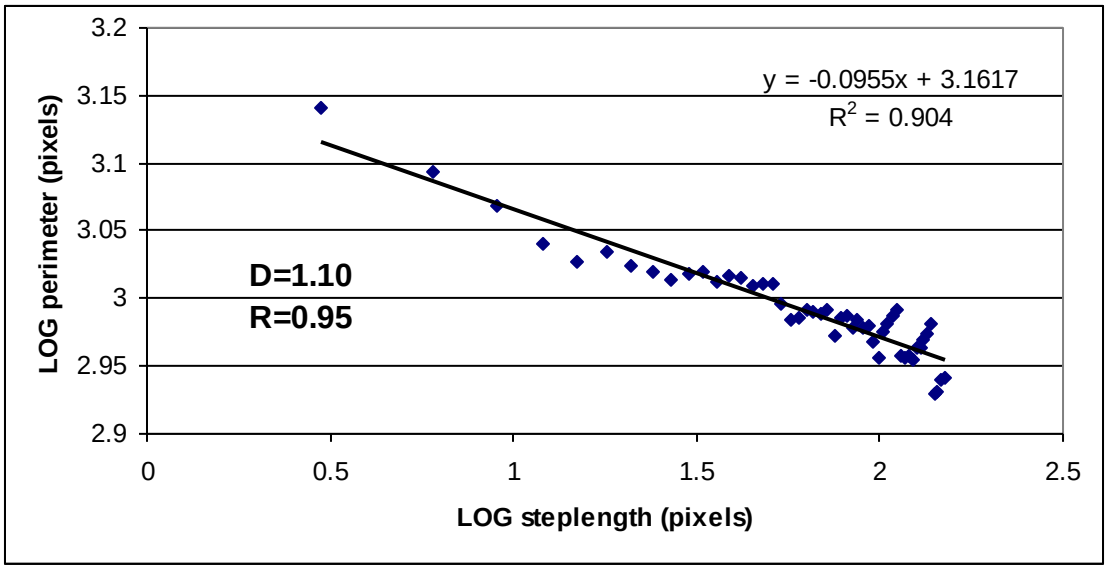
10JAUOK011F 4-phi: Glass Particle 3

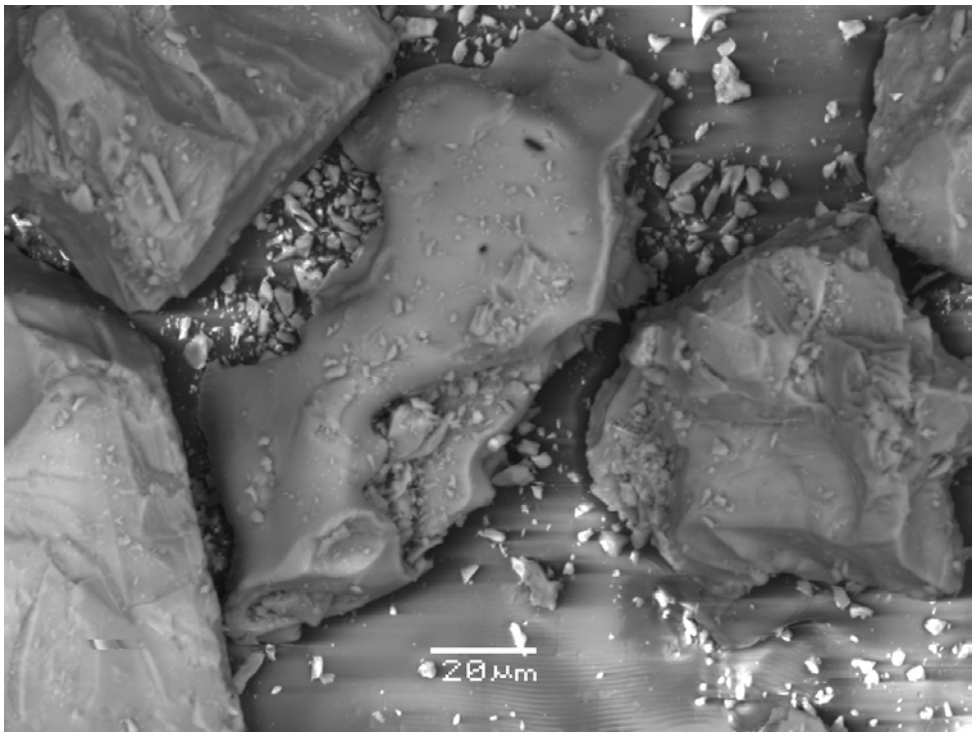


Monofractal particles with high fractal dimension (D>1.09)

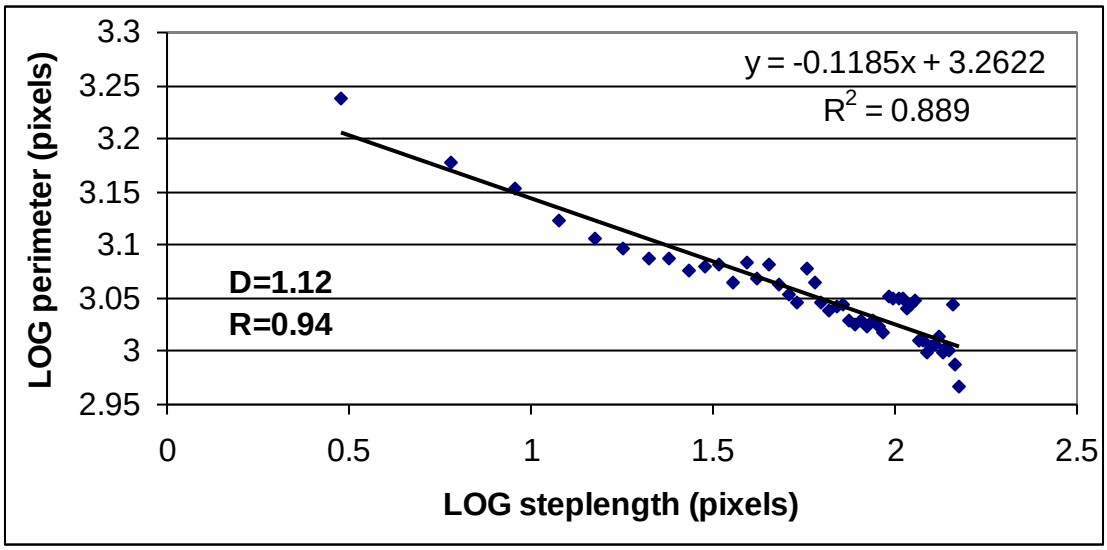


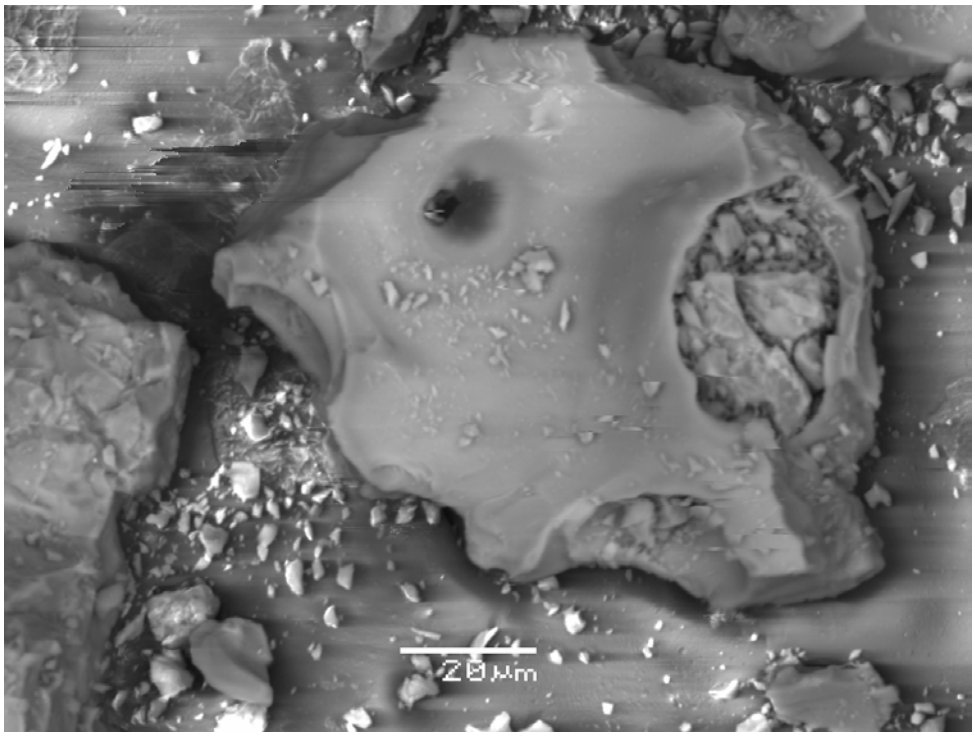
10JAUOK005E 4-phi: Glass Particle 11



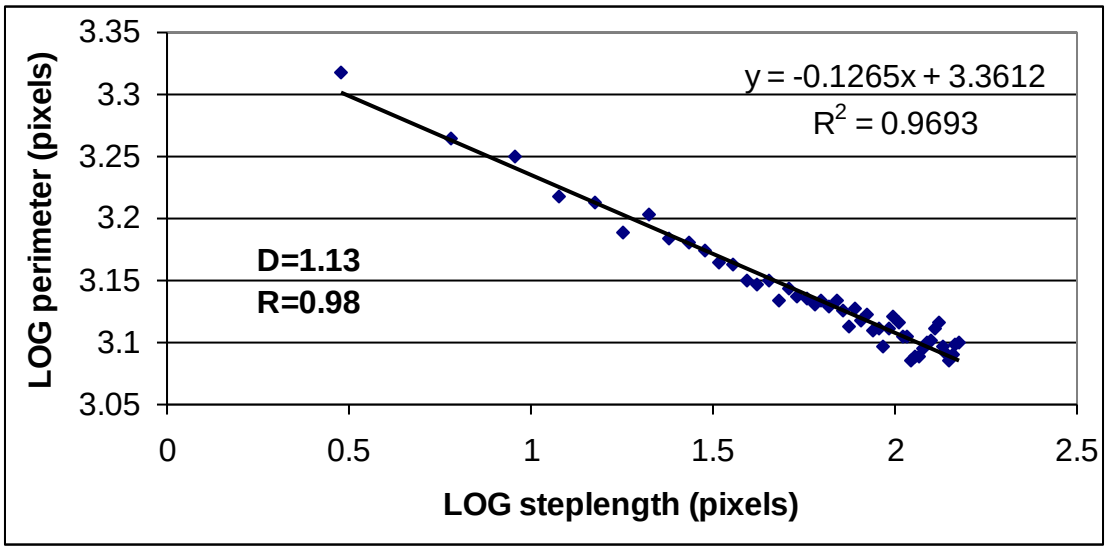


10JAUOK011B 4-phi: Glass Particle 4





10JAUOK011B 4-phi: Glass Particle 9



Appendix C: Digital appendices

The included disc contains the following files:

SFT data sorted by unit
Raw grain-size data
Raw componentry data
Okmok GIS files
SEM images of all imaged particles