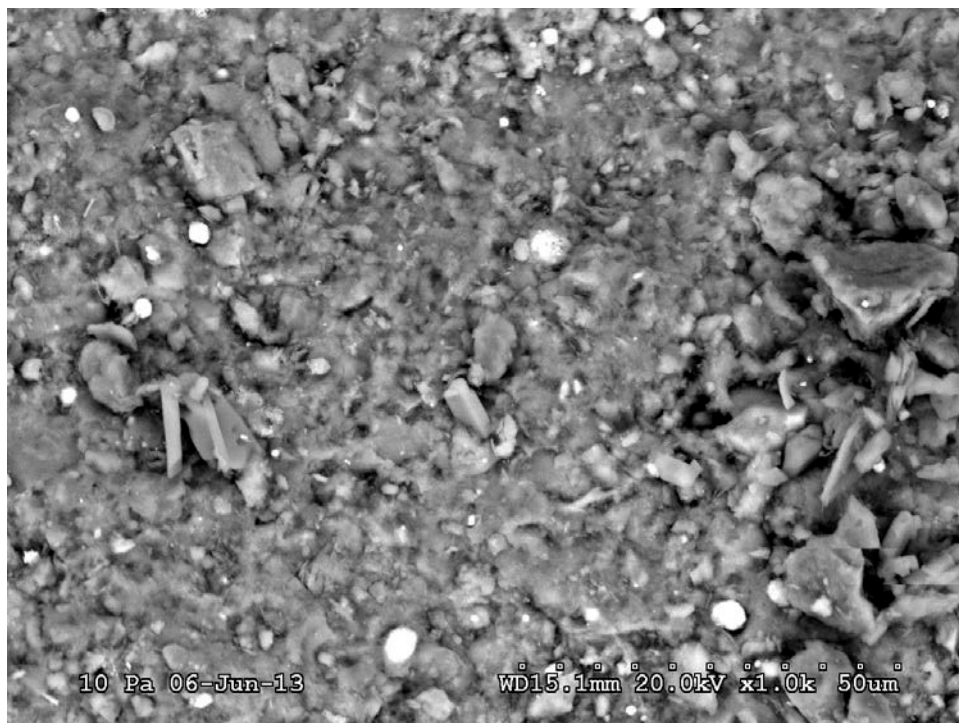
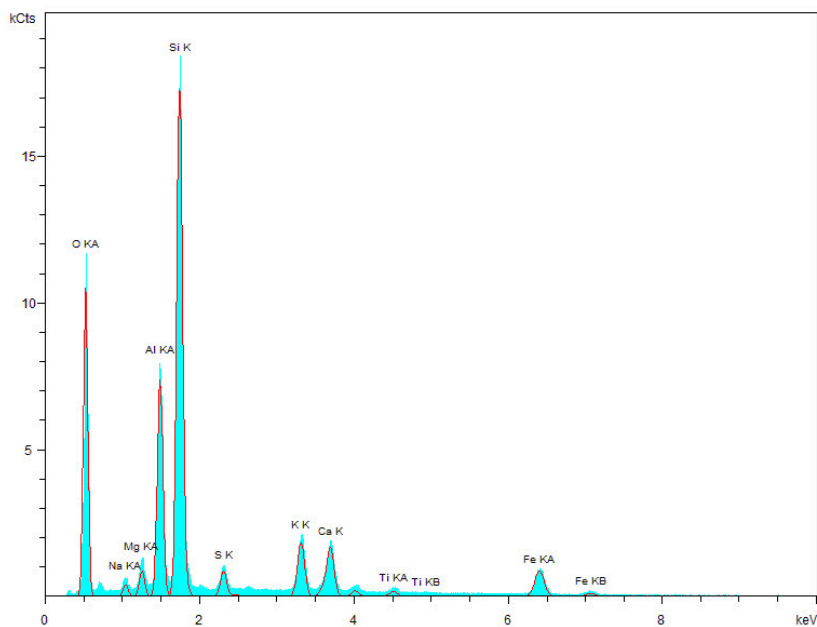


**Appendix 6-C. Scanning electron microscopy – Energy-dispersive data prepared by
John Barnes of the Pennsylvania Geological Survey**

API# 3701990063, Hockenberry No. 1 – 8504-8513 ft



S13-013-001

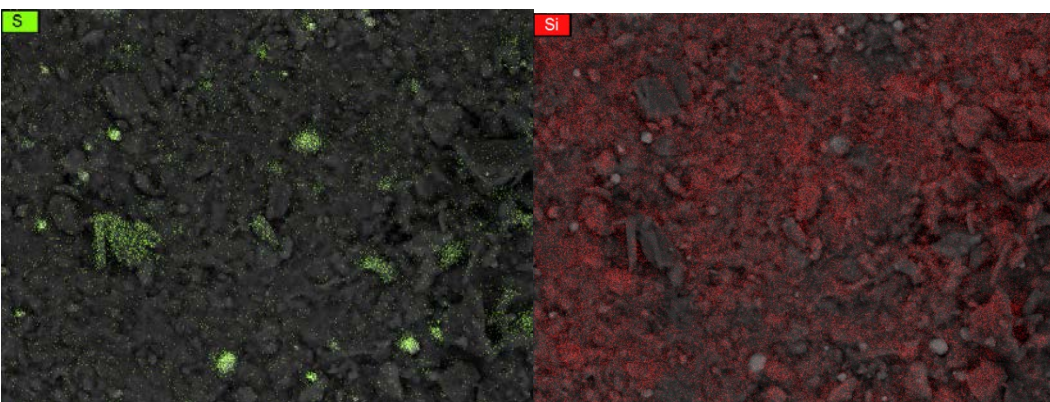
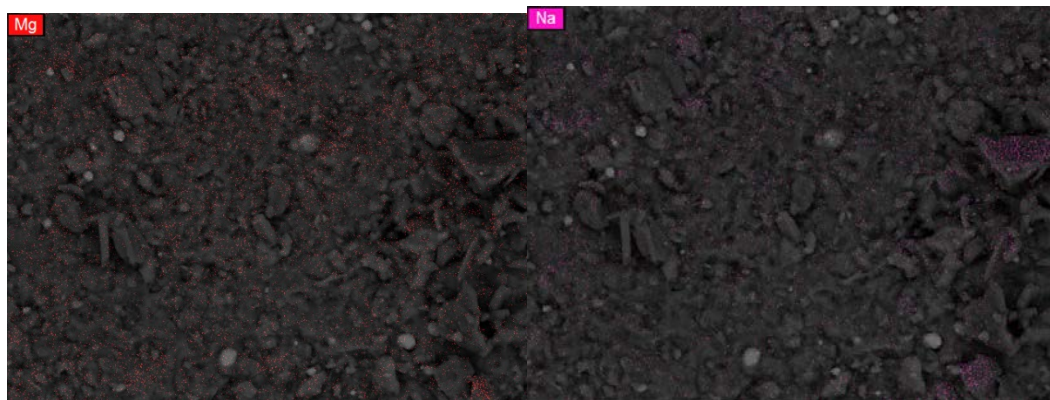
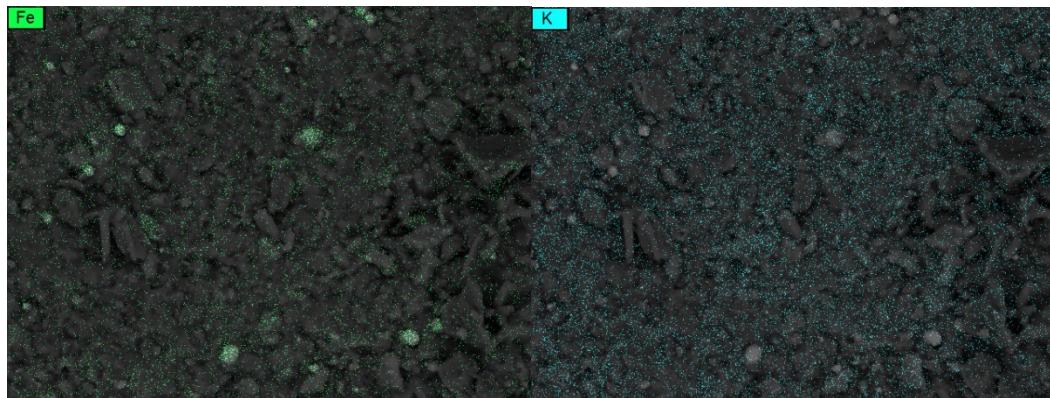
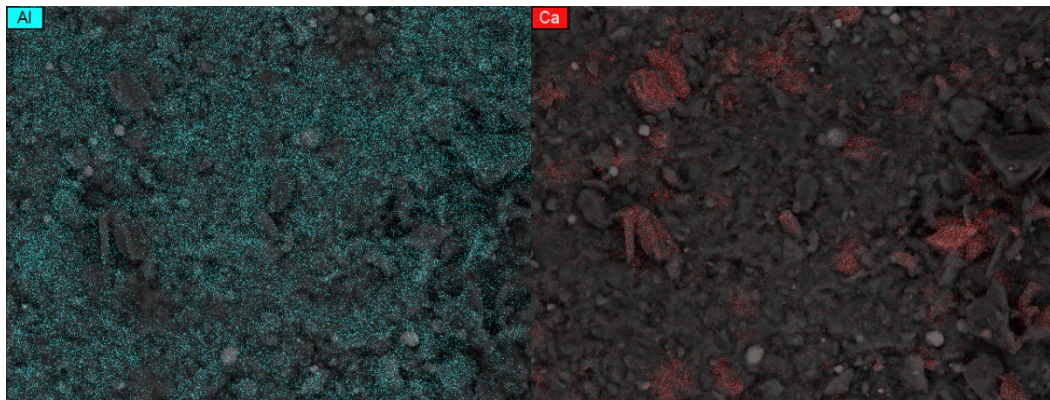


Data Number: 002119
Magnification: 1000
Accelerating Voltage: 20000 Volt
Emission Current: 68000 nA
Working Distance: 15100 um
Sub-Signal: BSE2
Vacuum: 10 P
Beam: 50

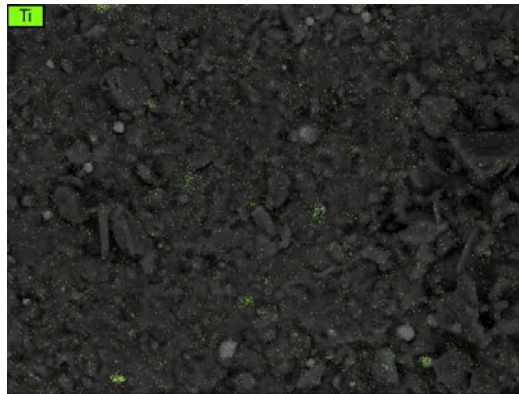
Element	Concentration
O	56.81 wt%
Na	0.93
Mg	1.28
Al	8.44
Si	21.06
S	1.28
K	2.94
Ca	2.87
Ti	0.39
Fe	3.99

EDS Spectrum with graph and list of elements detected

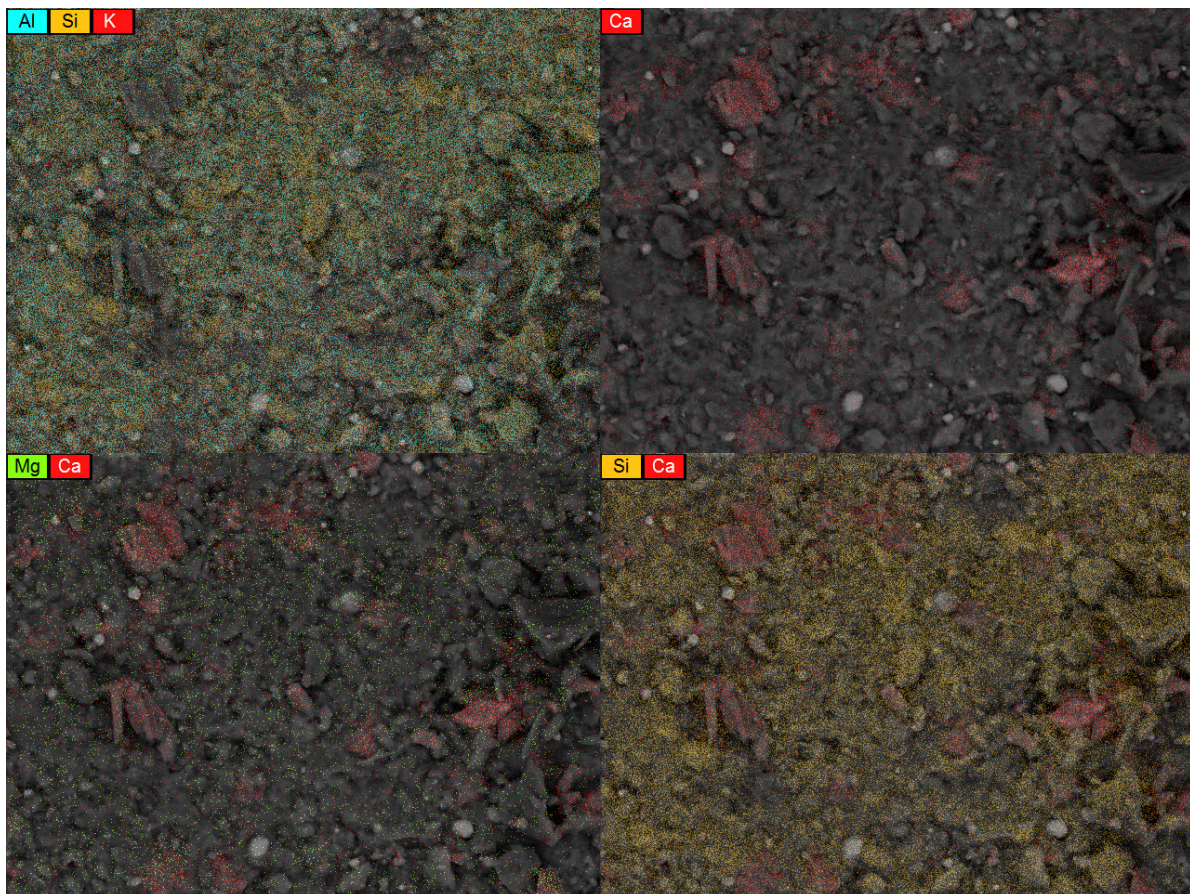
API# 3701990063, Hockenberry No. 1 – 8504-8513 ft



API# 3701990063, Hockenberry No. 1 – 8504-8513 ft

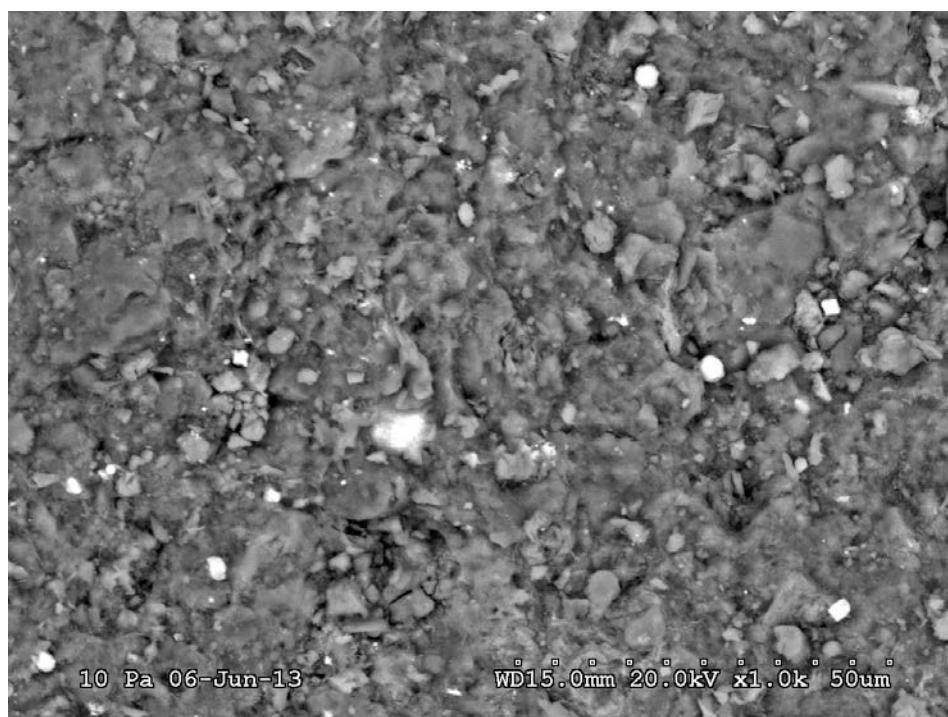


Individual element maps

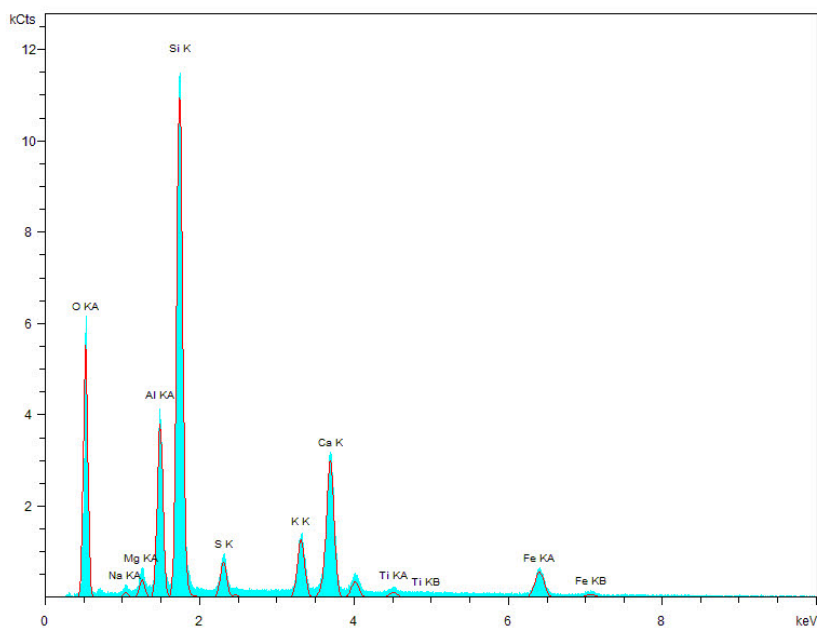


Multiple element maps

API# 3701990063, Hockenberry No. 1 – 8619-8632 ft



S13-013-005

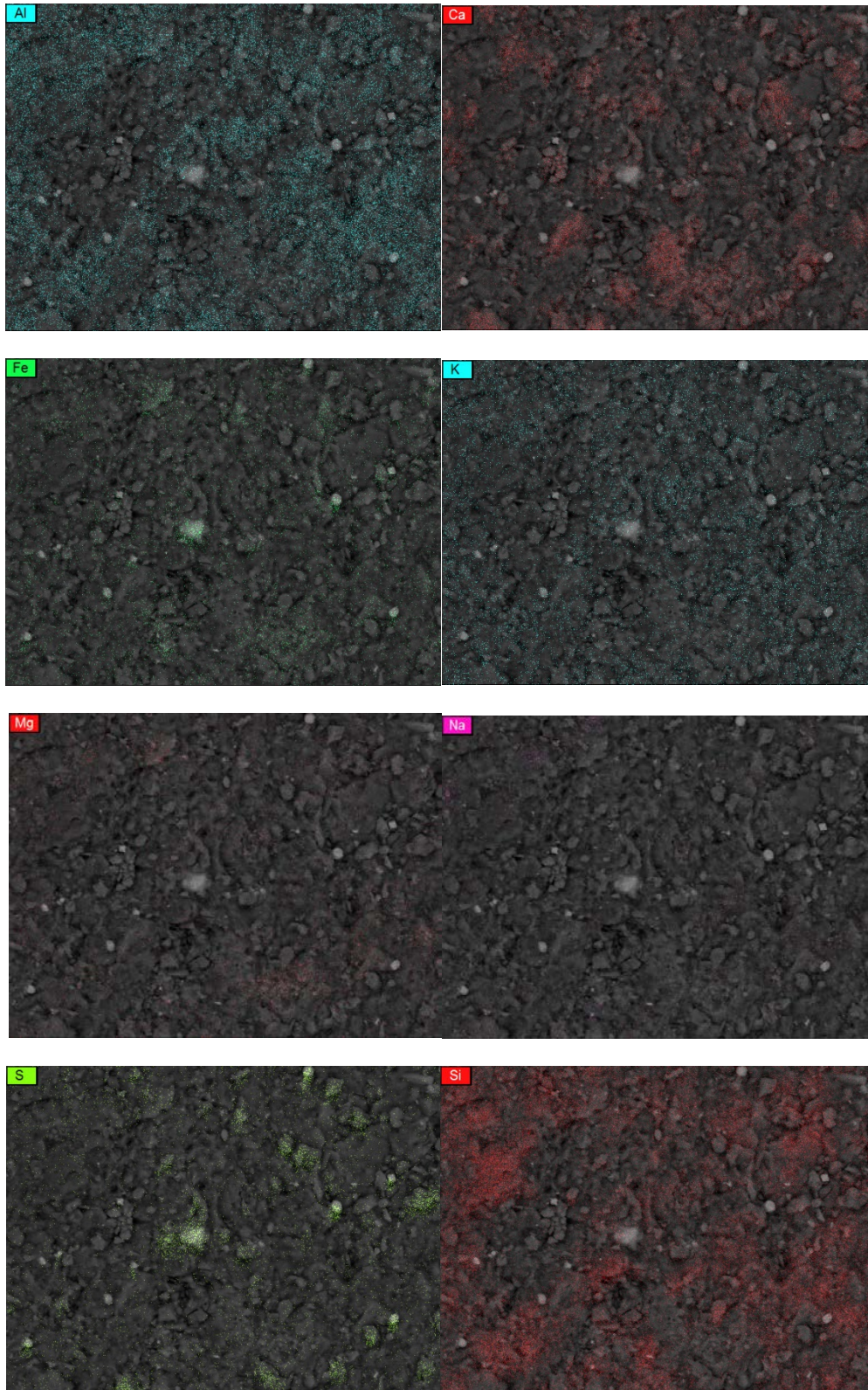


Data Number: 002121
Magnification: 1000
Accelerating Voltage: 20000 Volt
Emission Current: 66000 nA
Working Distance: 15000 um
Sub-Signal: BSE2
Vacuum: 10 P
Beam: 50

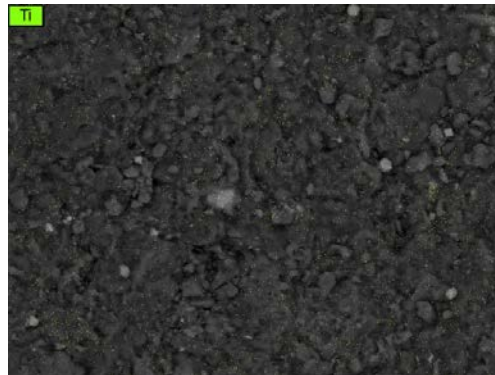
Element	Concentration
O	55.41 wt%
Na	0.40
Mg	0.88
Al	6.69
Si	19.82
S	1.71
K	3.00
Ca	7.84
Ti	0.41
Fe	3.84

EDS Spectrum with graph and list of elements detected

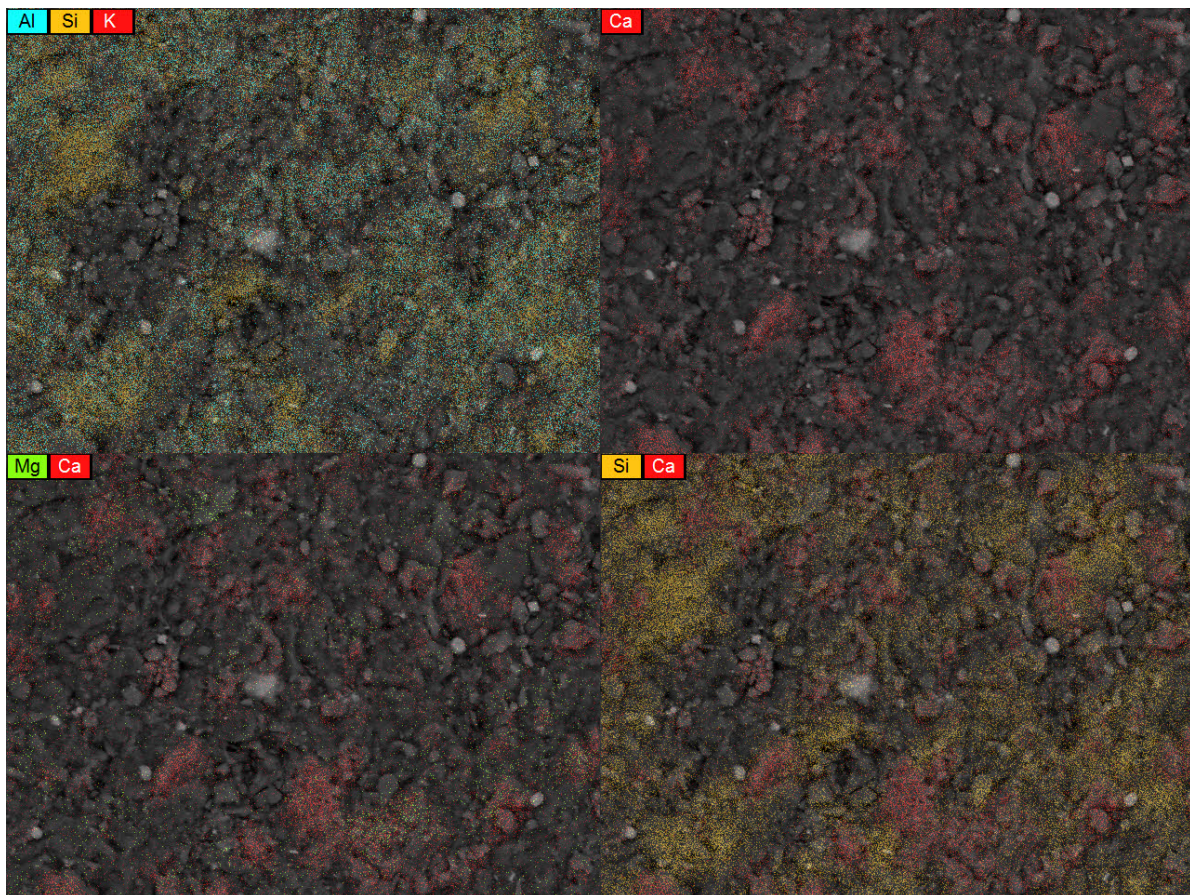
API# 3701990063, Hockenberry No. 1 – 8619-8632 ft



API# 3701990063, Hockenberry No. 1 – 8619-8632 ft

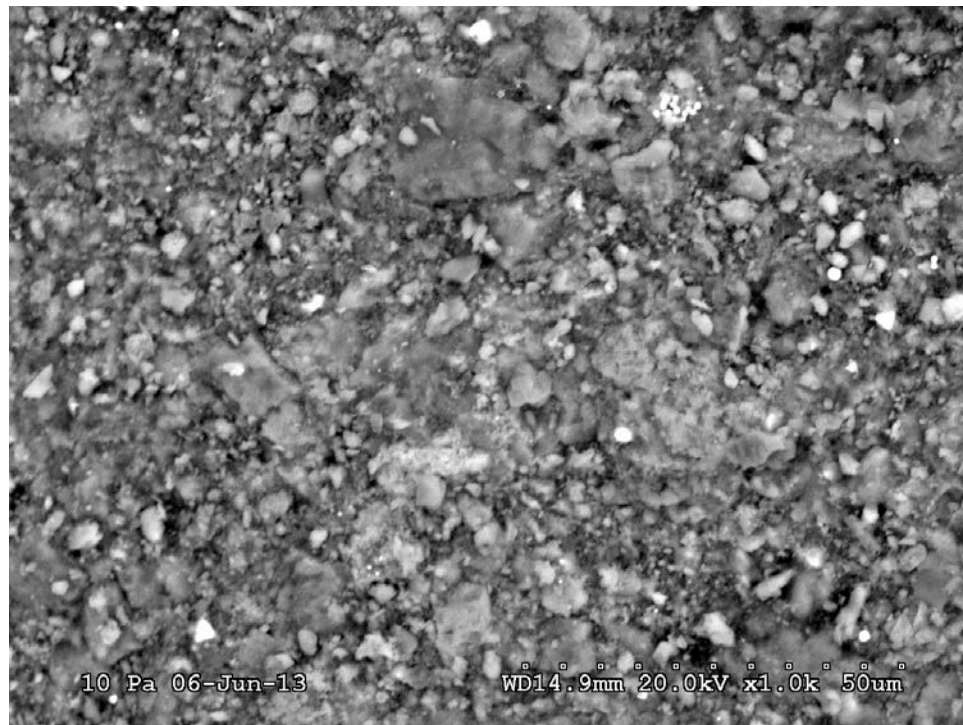


Individual element maps

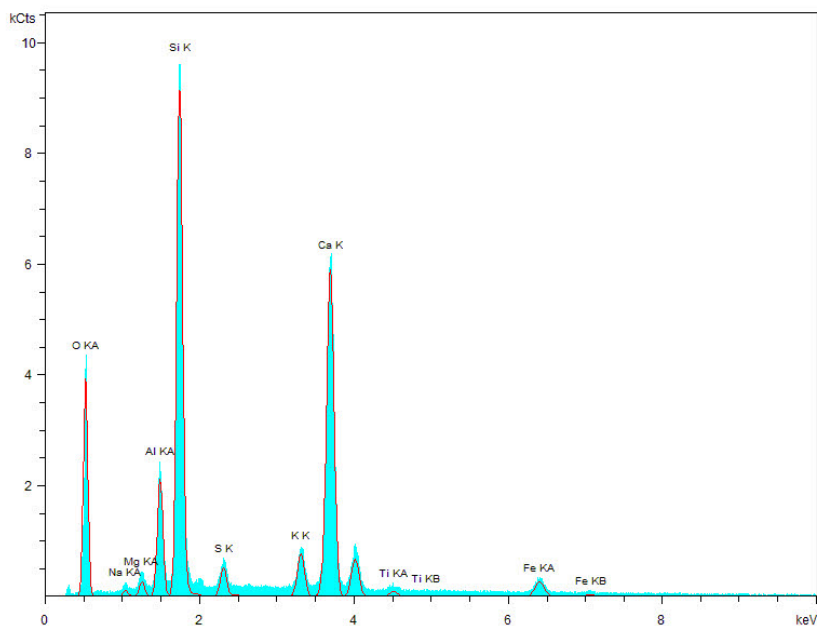


Multiple element maps

API# 3701990063, Hockenberry No. 1 – 8710-8722 ft



S13-013-007

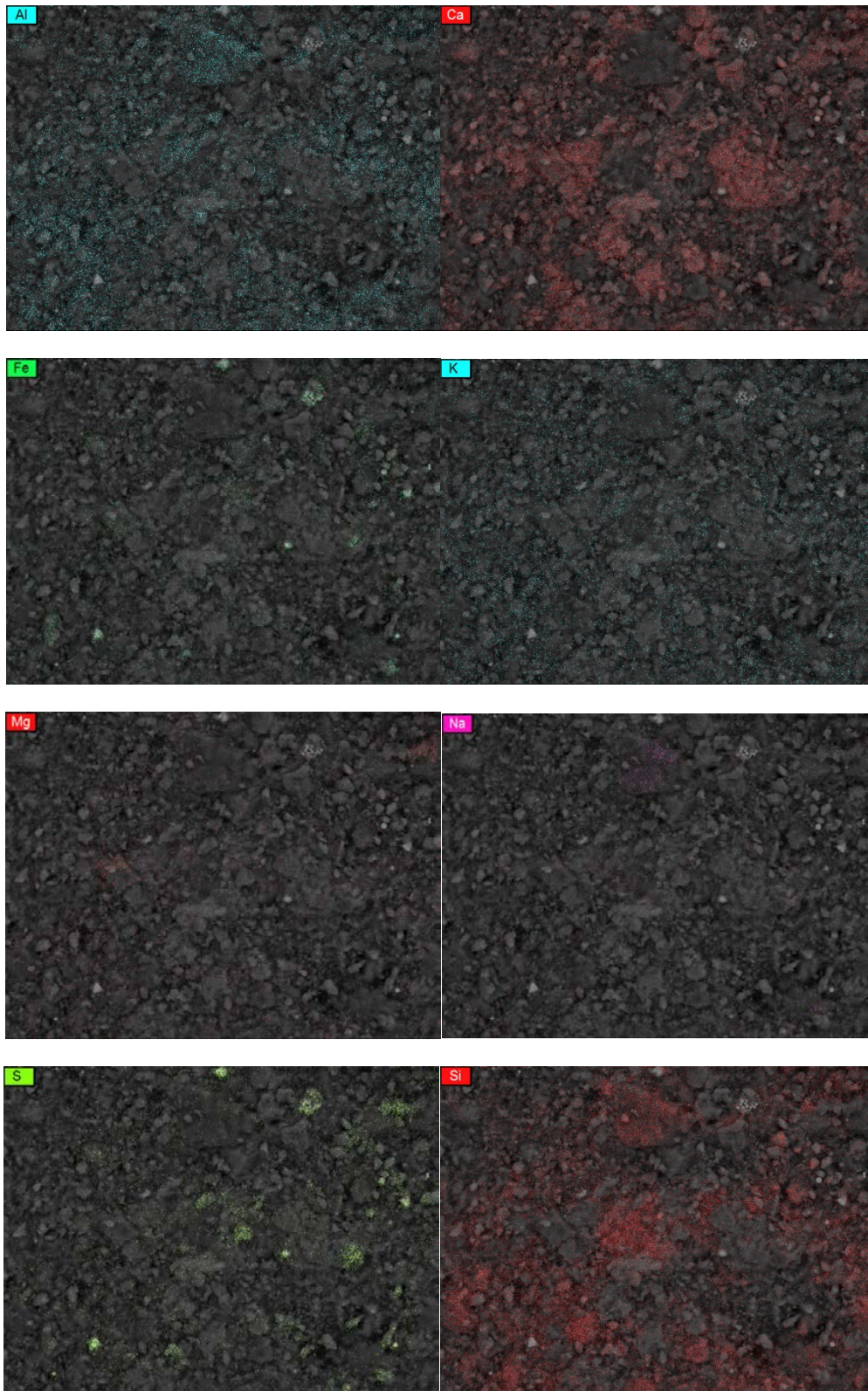


Data Number: 002122
Magnification: 1000
Accelerating Voltage: 20000 Volt
Emission Current: 65000 nA
Working Distance: 14900 um
Sub-Signal: BSE2
Vacuum: 10 P

Element	Concentration
O	54.73 wt%
Na	0.48
Mg	0.68
Al	4.21
Si	17.68
S	1.20
K	1.95
Ca	16.66
Ti	0.37
Fe	2.04

EDS Spectrum with graph and list of elements detected

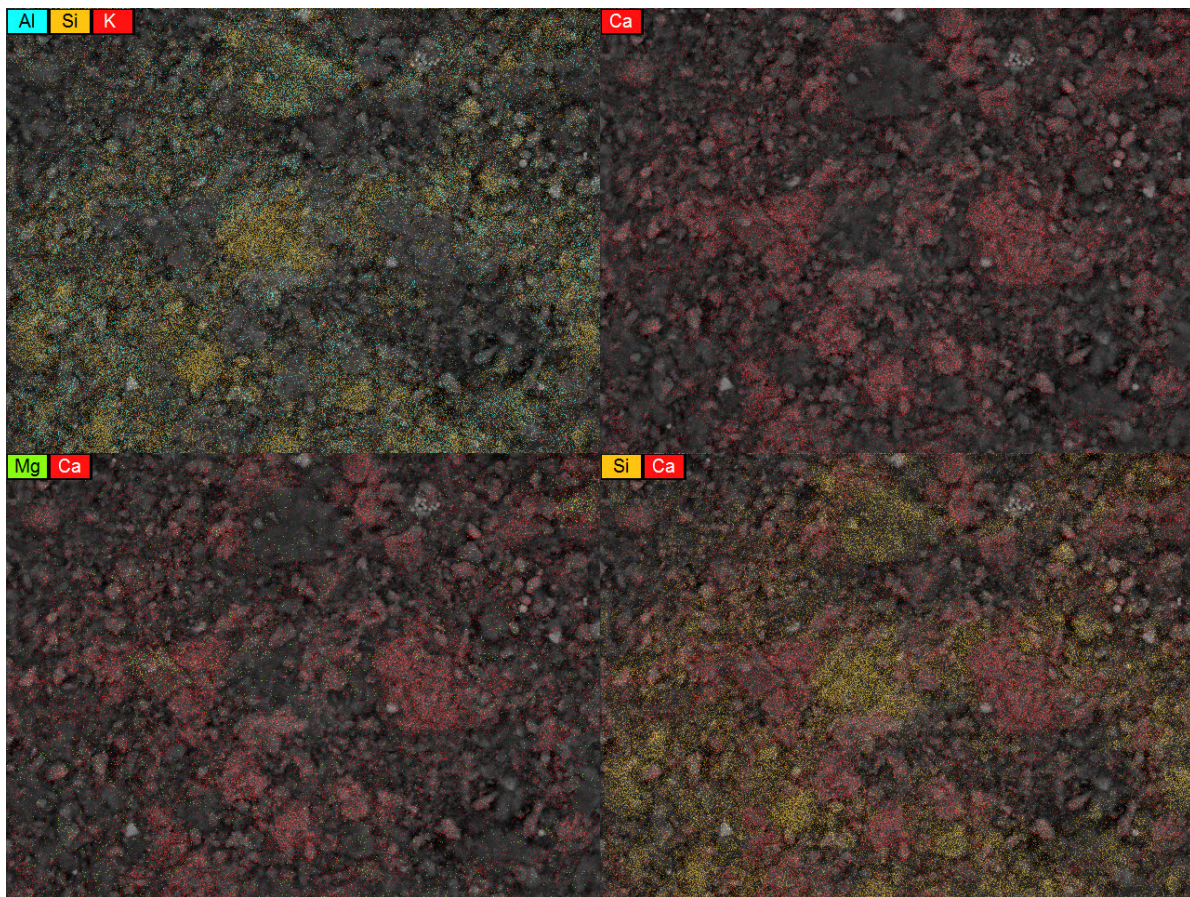
API# 3701990063, Hockenberry No. 1 – 8710-8722 ft



API# 3701990063, Hockenberry No. 1 – 8710-8722 ft

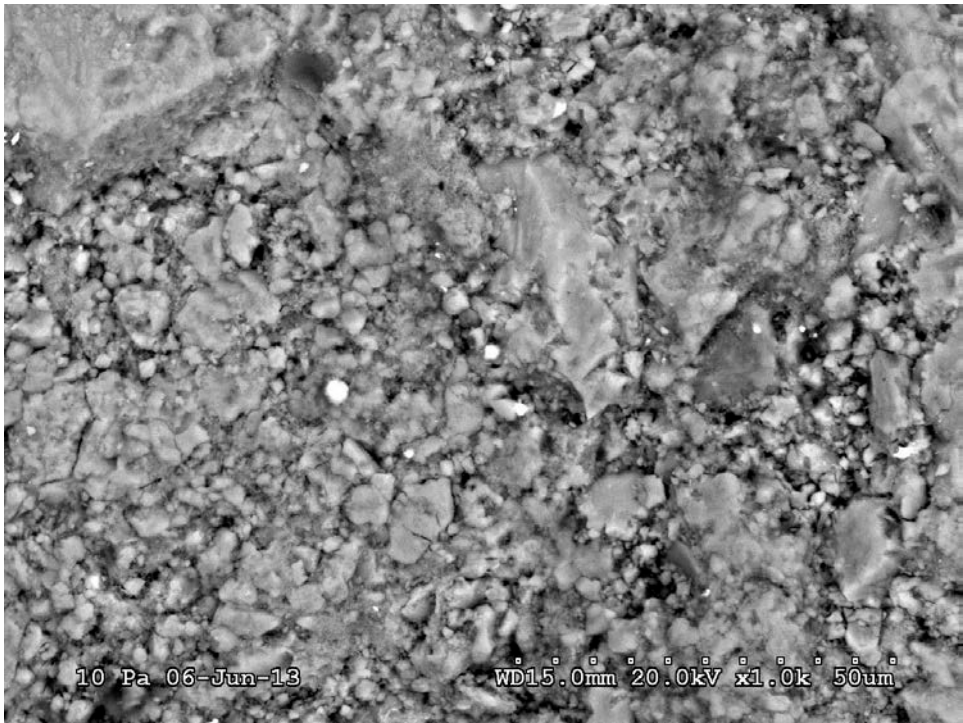


Individual element maps

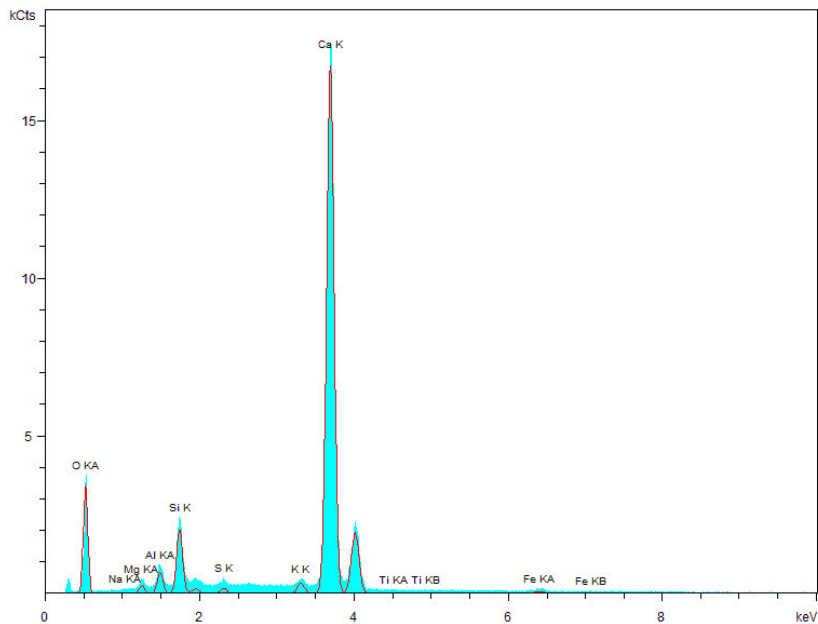


Multiple element maps

API# 3701990063, Hockenberry No. 1 – 8784-8795 ft



S13-013-009

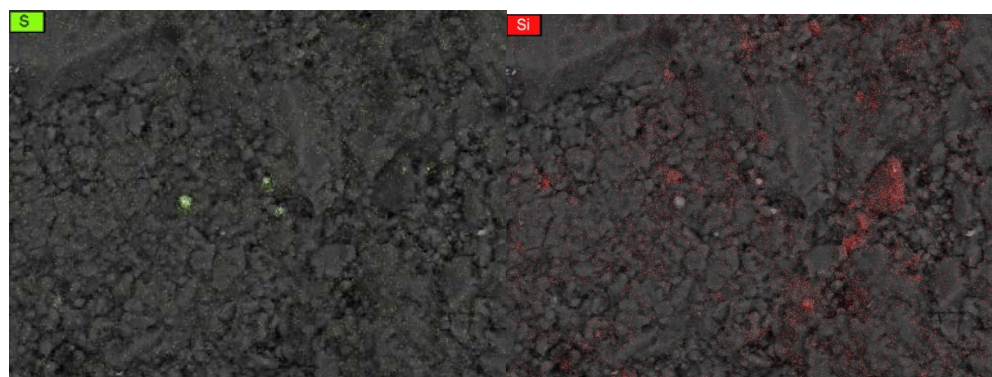
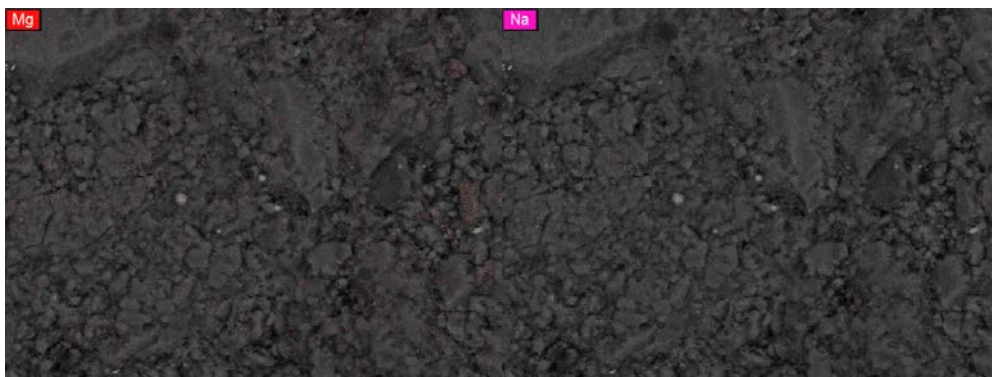
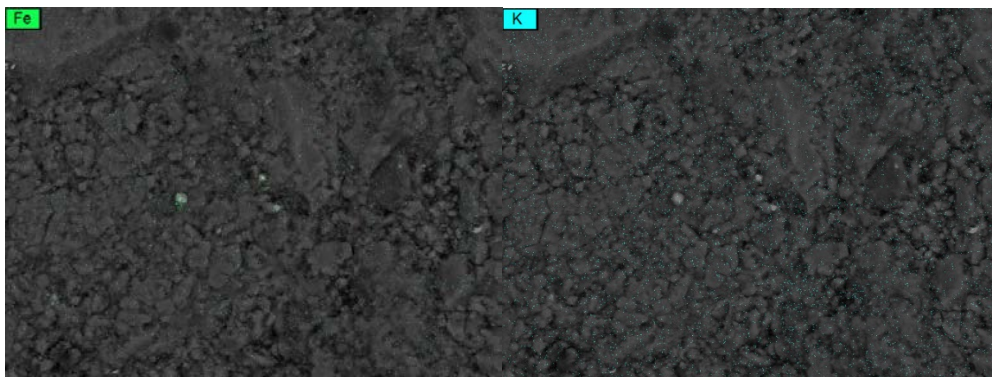
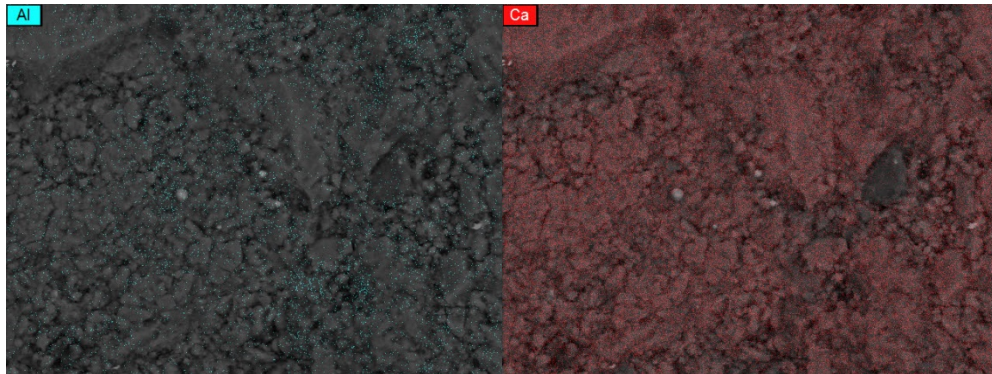


Data Number: 002123
Magnification: 1000
Accelerating Voltage: 20000 Volt
Emission Current: 65000 nA
Working Distance: 15000 um
Sub-Signal: BSE2
Vacuum: 10 P
Beam: 50

Element	Concentration
O	56.36 wt%
Na	0.11
Mg	0.63
Al	1.26
Si	3.30
S	0.27
K	0.61
Ca	36.93
Ti	0.08
Fe	0.46

EDS Spectrum with graph and list of elements detected

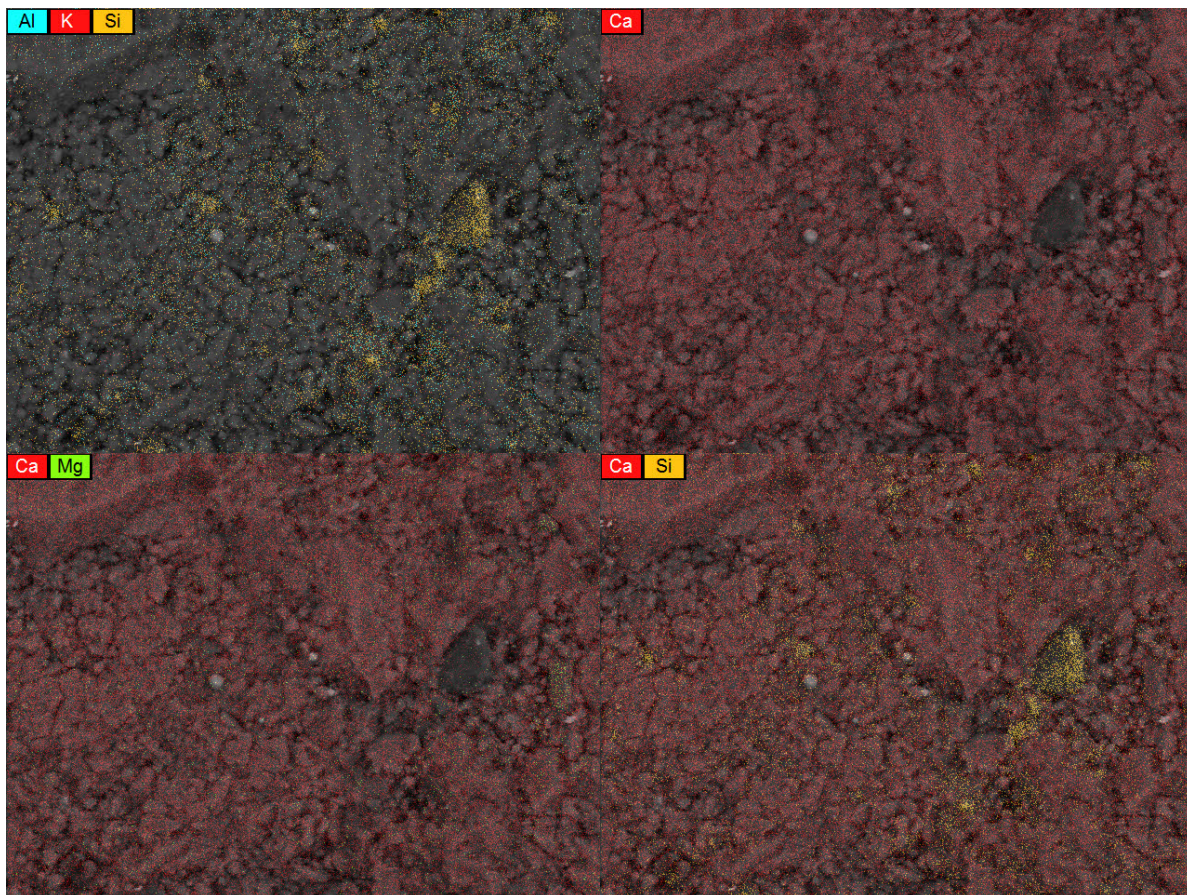
API# 3701990063, Hockenberry No. 1 – 8784-8795 ft



API# 3701990063, Hockenberry No. 1 – 8784-8795 ft

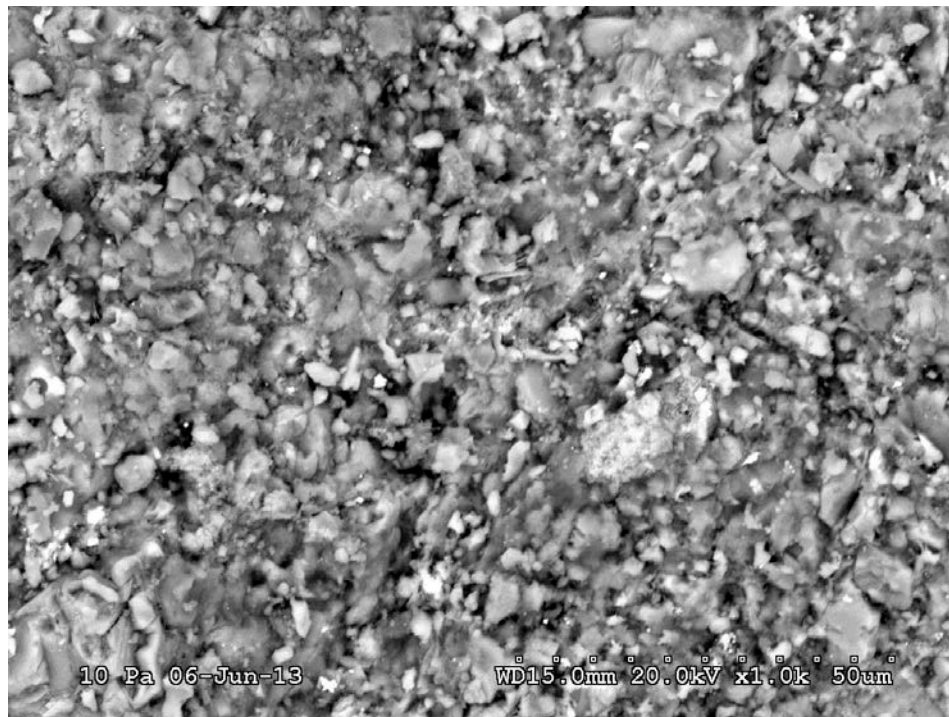


Individual element maps

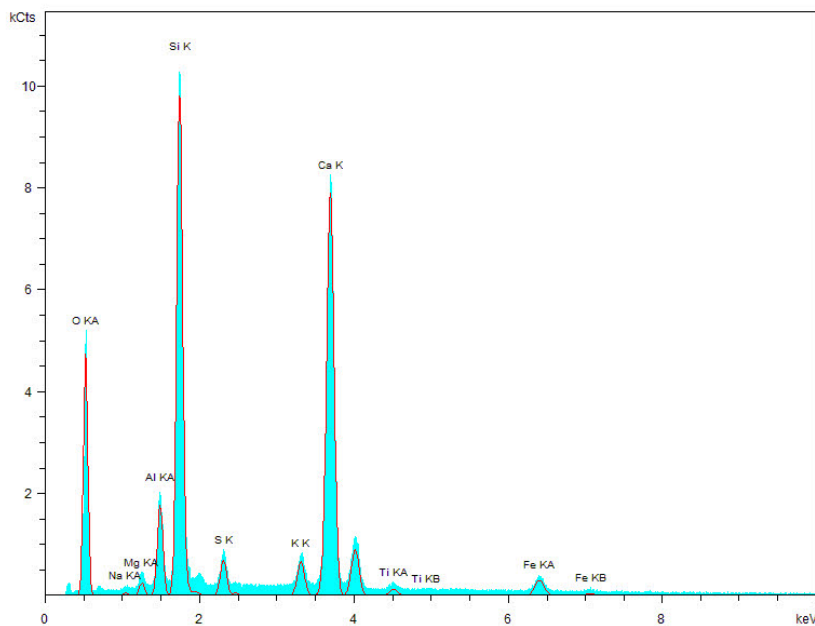


Multiple element maps

API# 3706720001, Shade Mt. No. 1 – 3720-3730 ft



S13-014-001

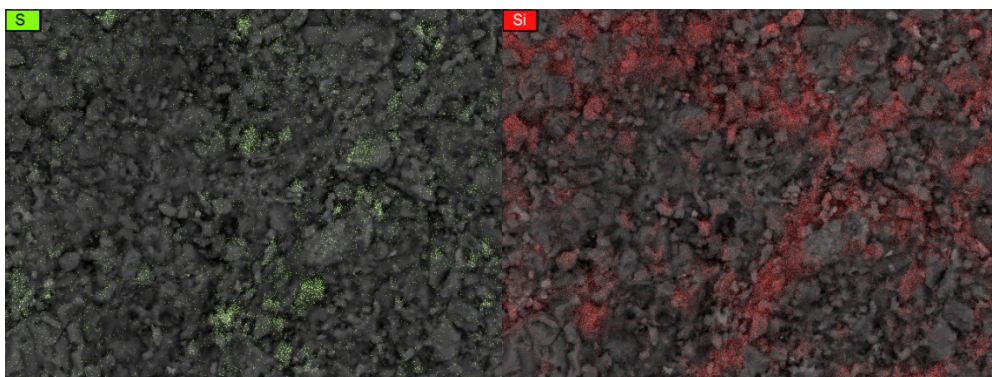
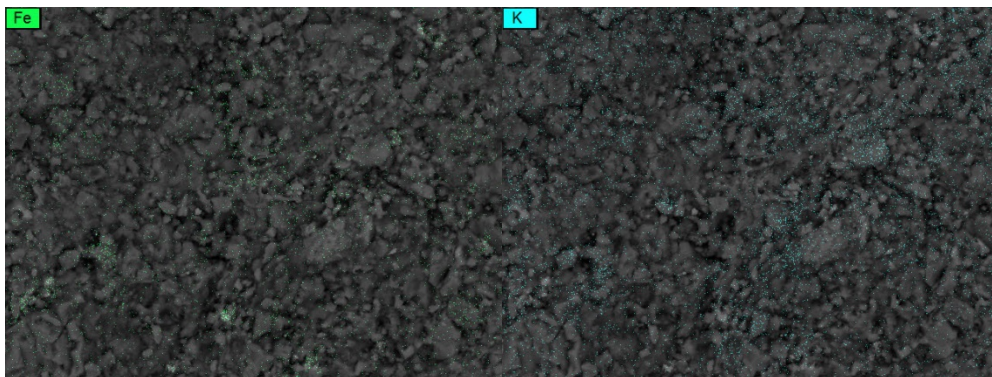
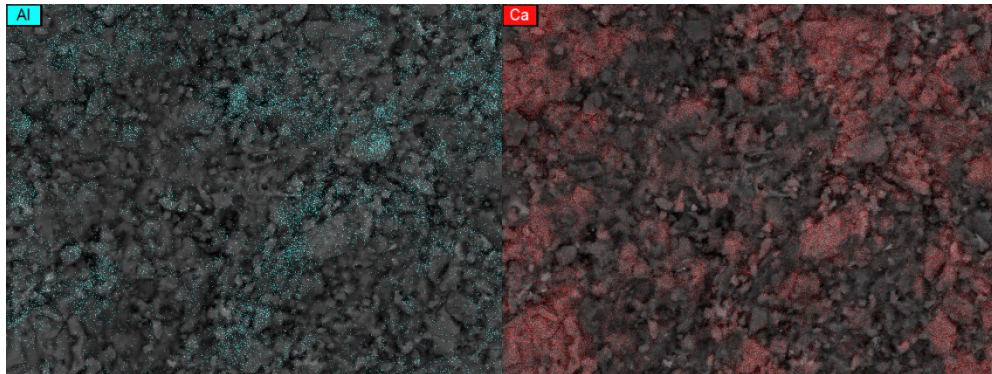


Data Number: 002124
Magnification: 1000
Accelerating Voltage: 20000 Volt
Emission Current: 68000 nA
Working Distance: 15000 um
Sub-Signal: BSE2
Vacuum: 10 P

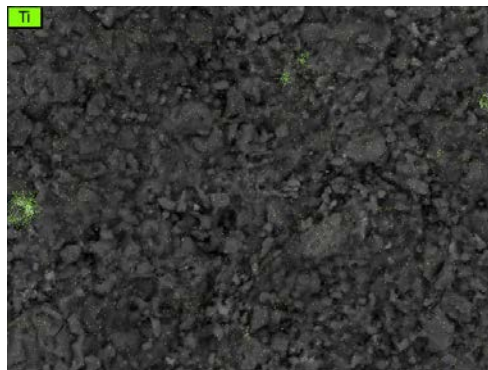
Element	Concentration
O	56.71 wt%
Na	0.18
Mg	0.55
Al	3.00
Si	15.80
S	1.31
K	1.40
Ca	18.64
Ti	0.43
Fe	1.97

EDS Spectrum with graph and list of elements detected

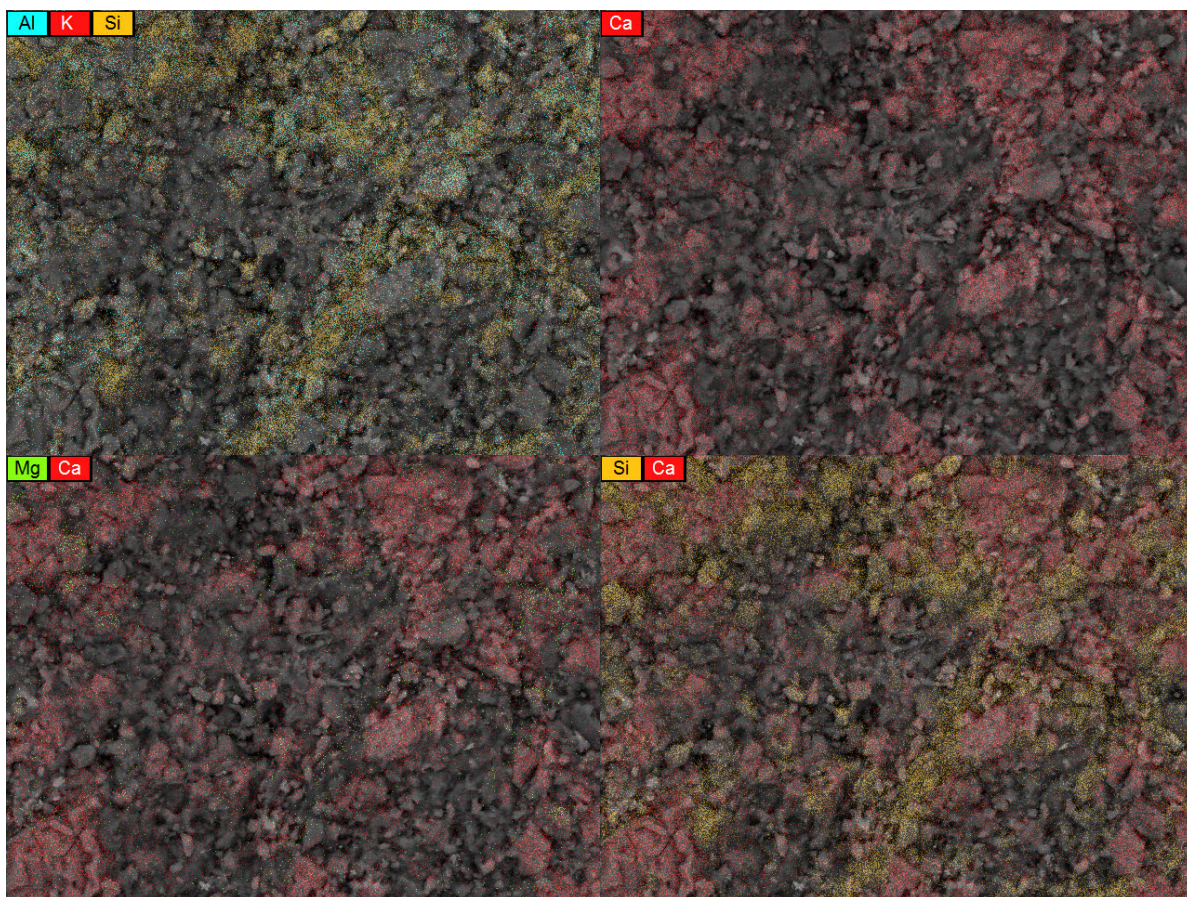
API# 3706720001, Shade Mt. No. 1 – 3720-3730 ft



API# 3706720001, Shade Mt. No. 1 – 3720-3730 ft

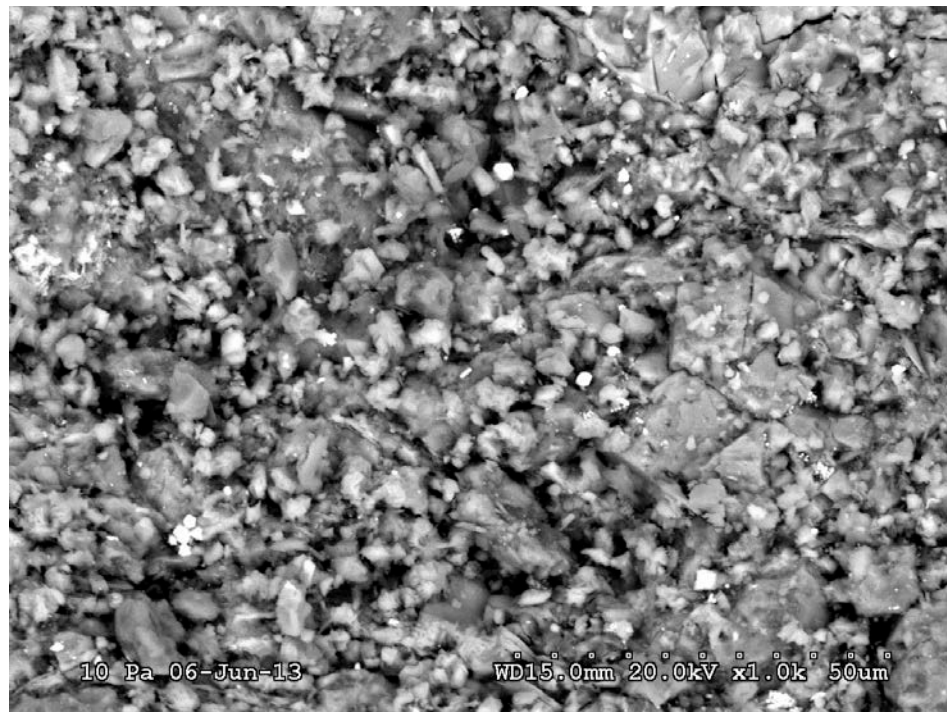


Individual element maps

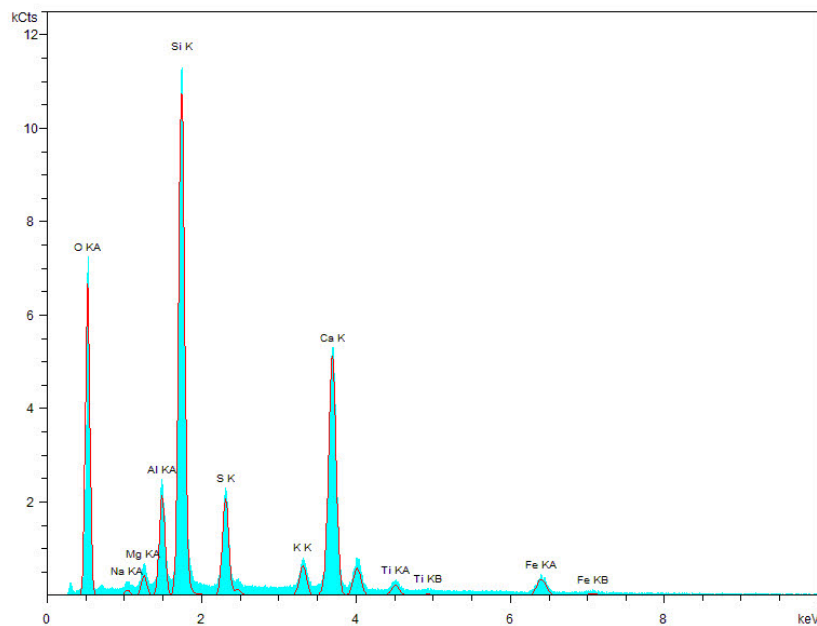


Multiple element maps

API# 3706720001, Shade Mt. No. 1 – 3750-3760 ft



S13-014-003

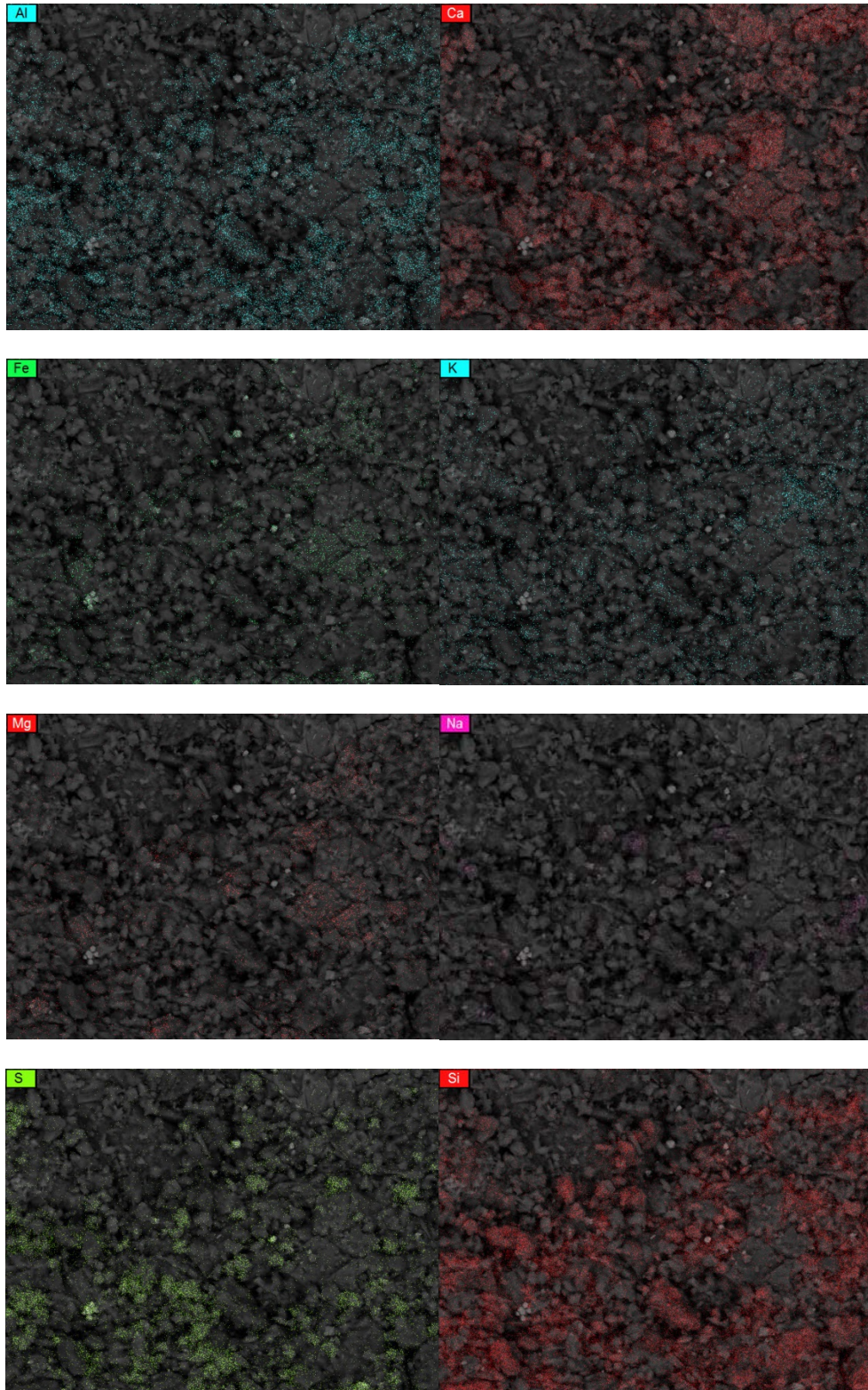


Data Number: 002126
Magnification: 1000
Accelerating Voltage: 20000 Volt
Emission Current: 65000 nA
Working Distance: 15000 um
Sub-Signal: BSE2
Vacuum: 10 P
Beam: 50

Element	Concentration
O	60.26 wt%
Na	0.40
Mg	0.86
Al	3.35
Si	16.05
S	3.68
K	1.27
Ca	11.35
Ti	0.70
Fe	2.09

EDS Spectrum with graph and list of elements detected

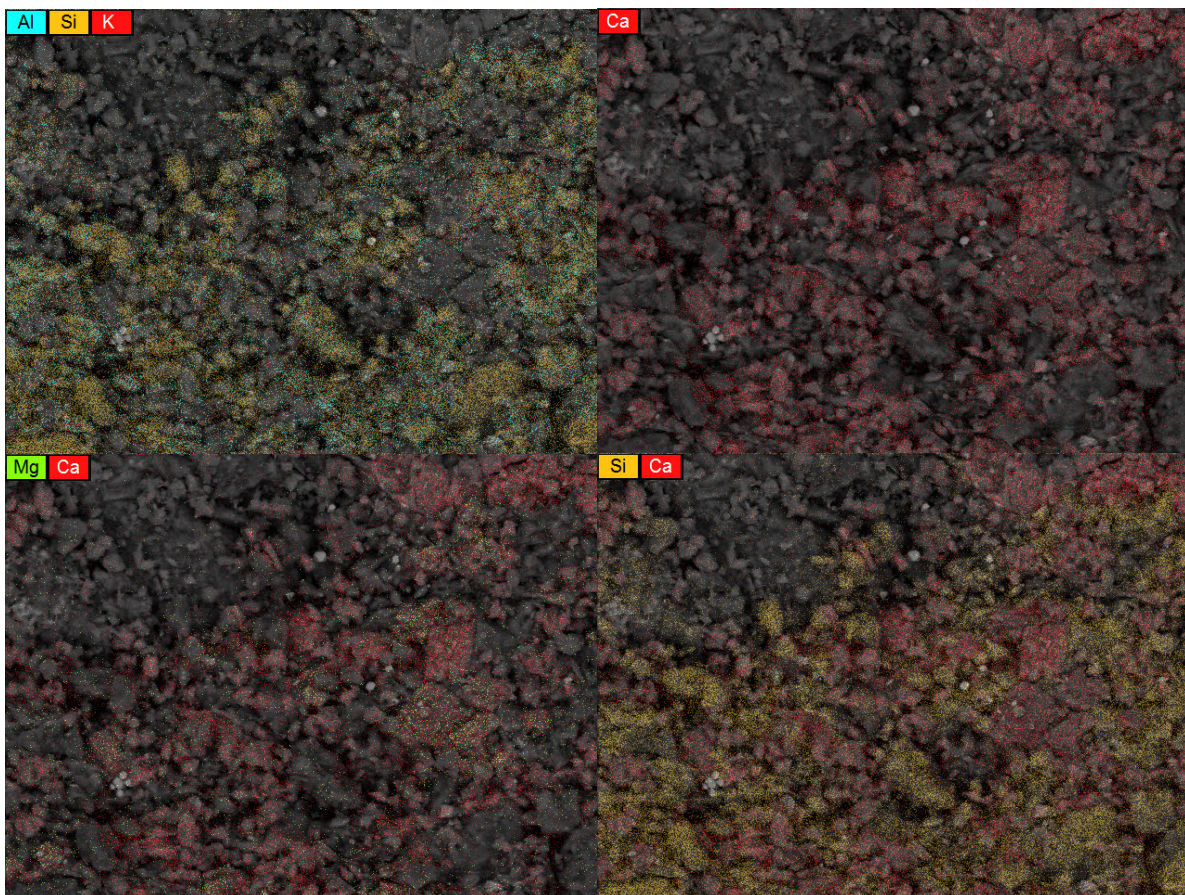
API# 3706720001, Shade Mt. No. 1 – 3750-3760 ft



API# 3706720001, Shade Mt. No. 1 – 3750-3760 ft

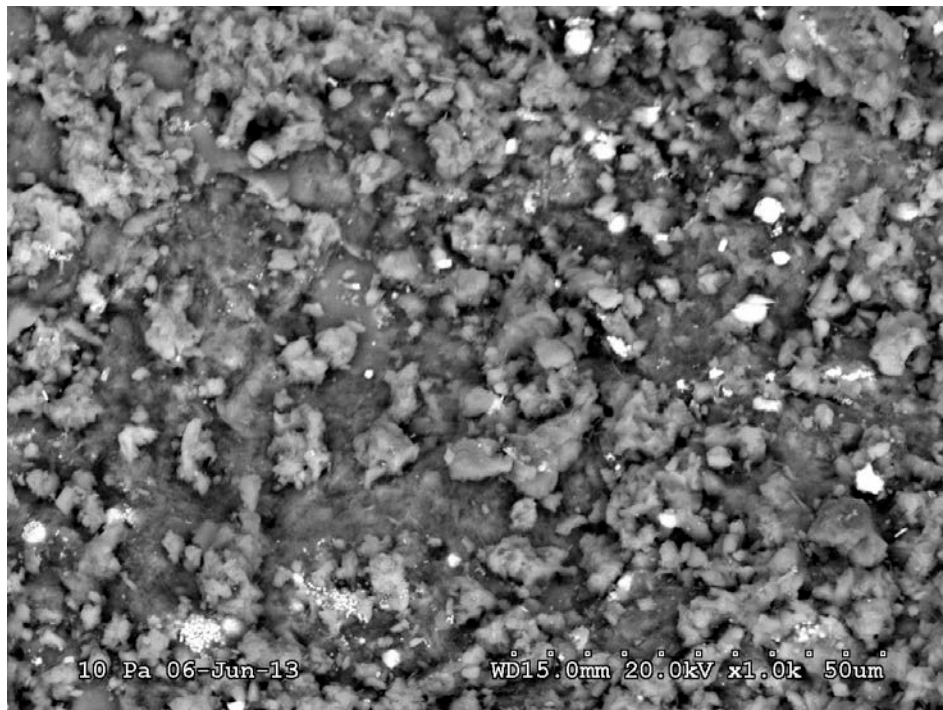


Individual element maps

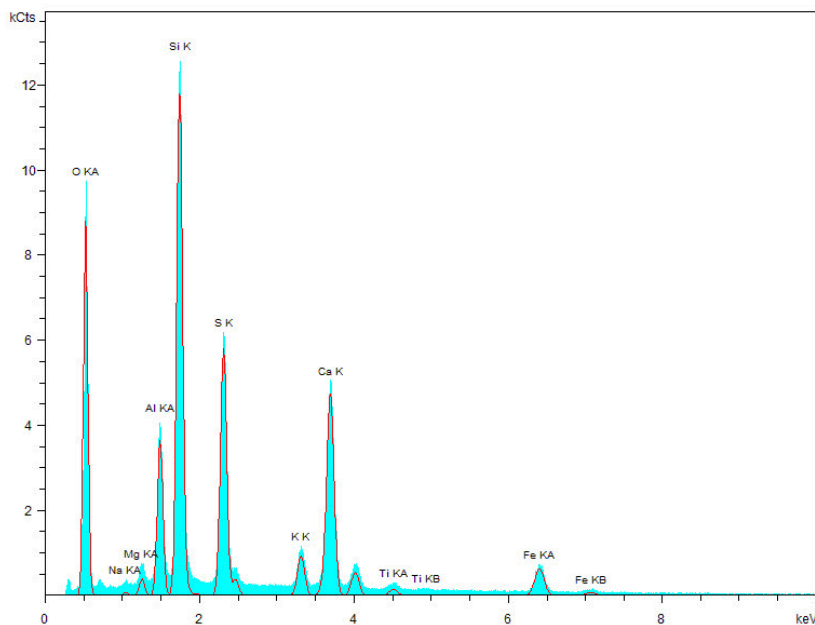


Multiple element maps

API# 3706720001, Shade Mt. No. 1 – 3770-3780 ft



S13-014-005

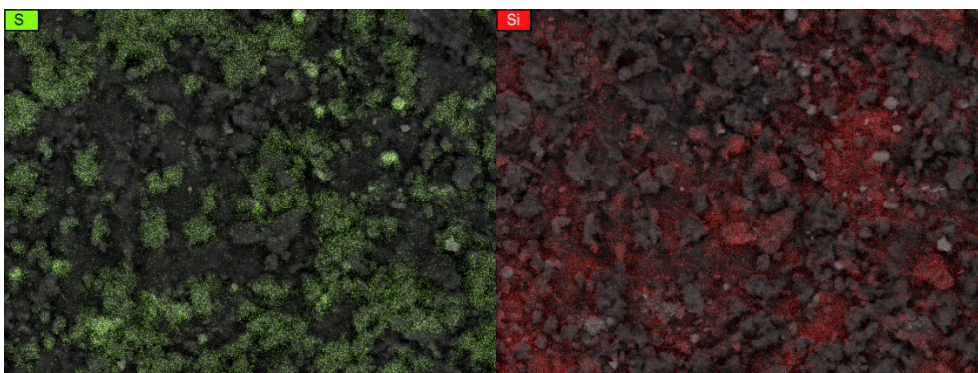
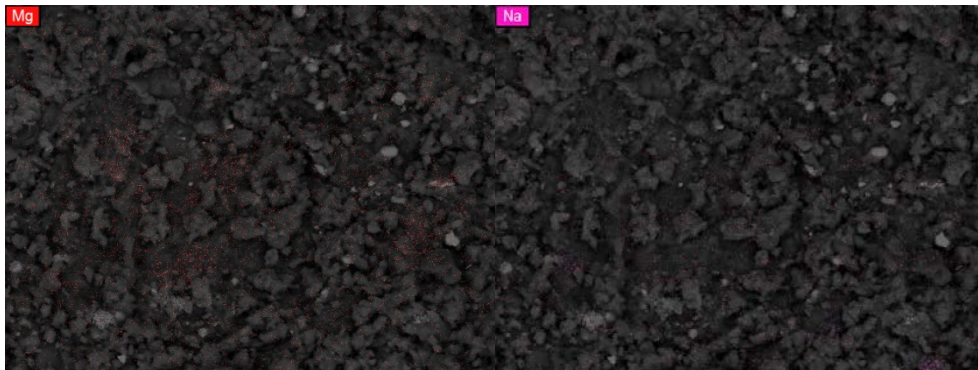
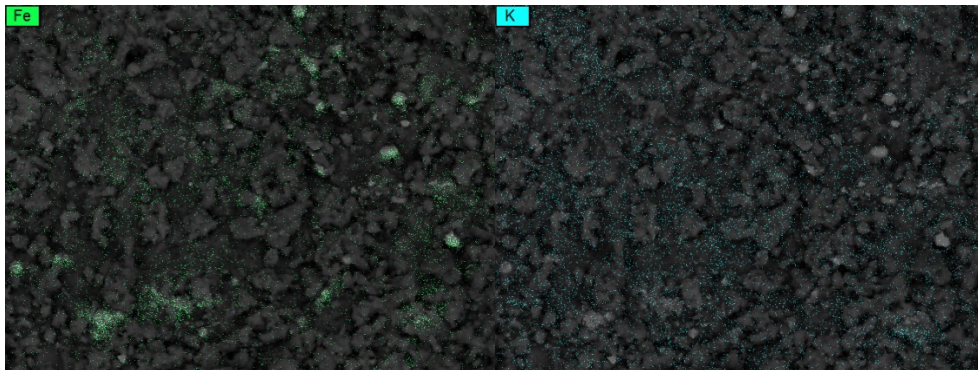
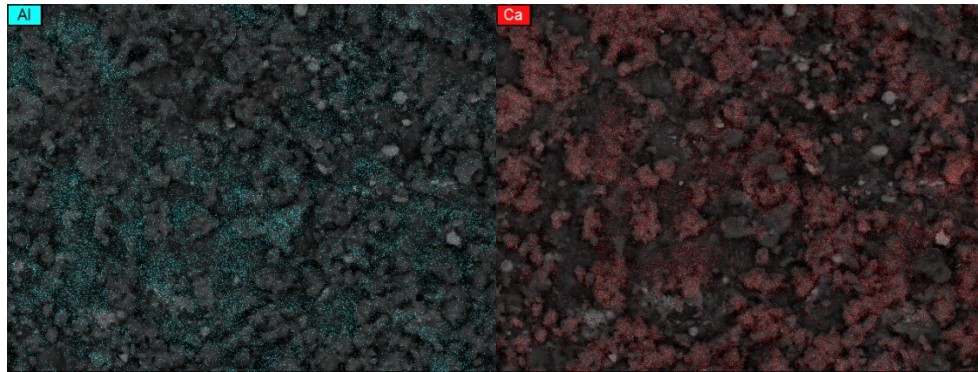


Data Number: 002127
Magnification: 1000
Accelerating Voltage: 20000 Volt
Emission Current: 65000 nA
Working Distance: 15000 um
Sub-Signal: BSE2
Vacuum: 10 P
Beam: 50

Element	Concentration
O	59.55 wt%
Na	0.19
Mg	0.61
Al	4.41
Si	13.98
S	7.93
K	1.54
Ca	8.41
Ti	0.37
Fe	3.00

EDS Spectrum with graph and list of elements detected

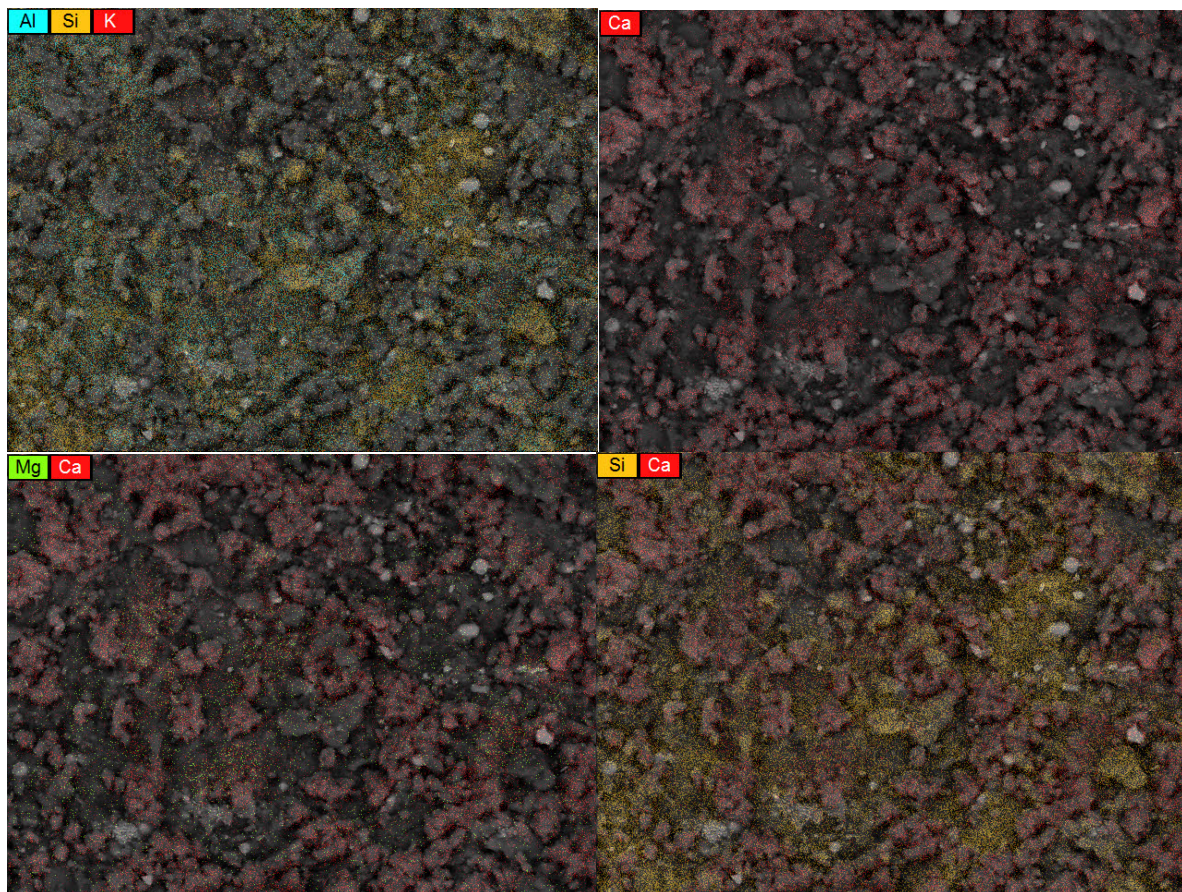
API# 3706720001, Shade Mt. No. 1 – 3770-3780 ft



API# 3706720001, Shade Mt. No. 1 – 3770-3780 ft

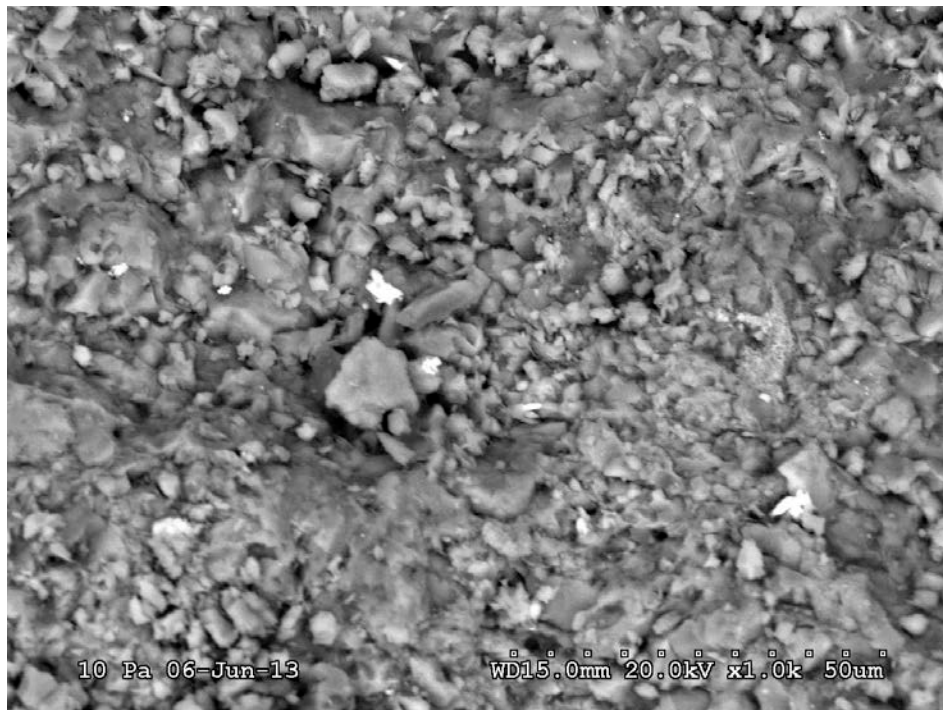


Individual element maps

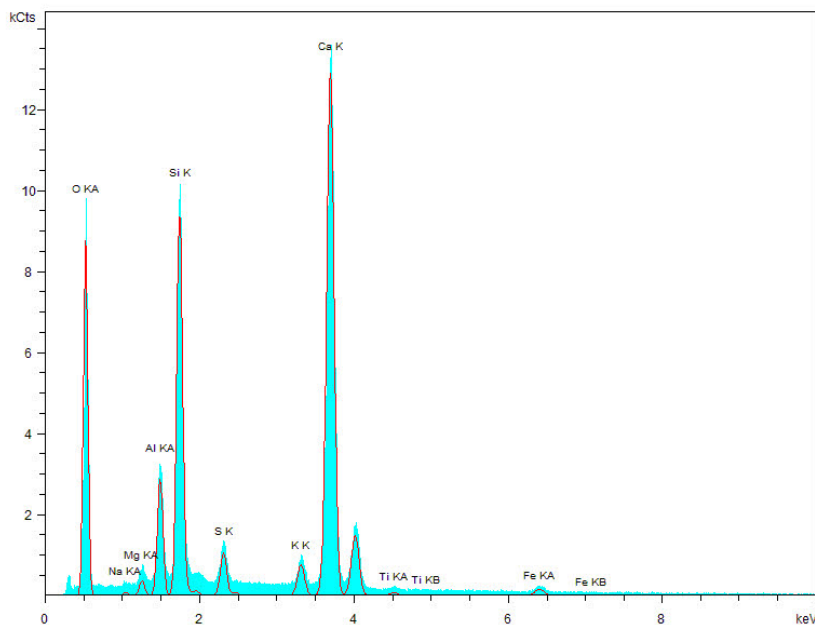


Multiple element maps

API# 3706720001, Shade Mt. No. 1 – 3800-3810 ft



S13-014-007

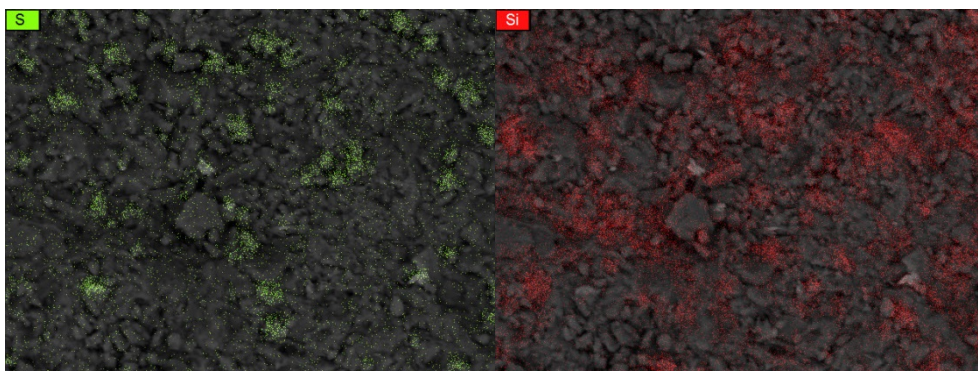
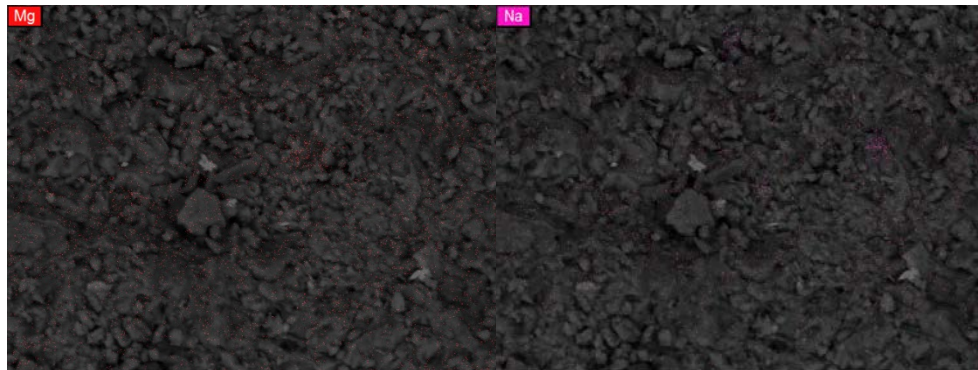
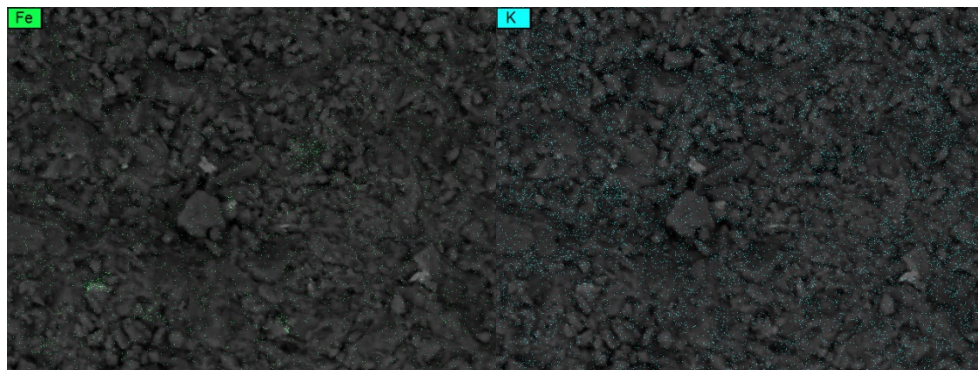
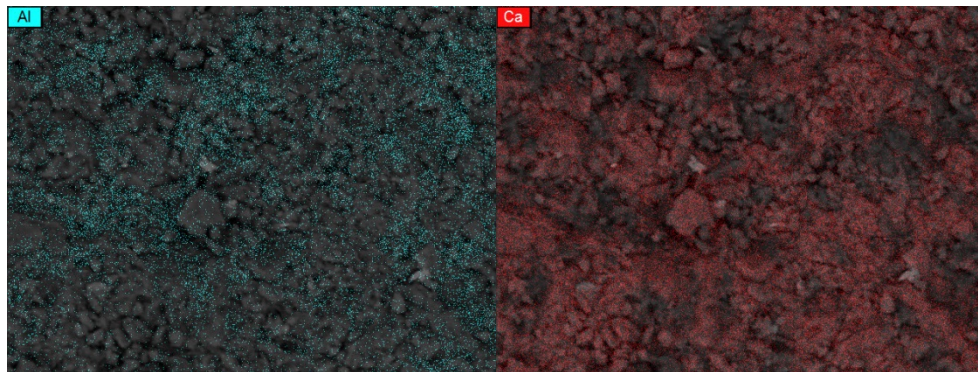


Data Number: 002128
Magnification: 1000
Accelerating Voltage: 20000 Volt
Emission Current: 65000 nA
Working Distance: 15000 um
Sub-Signal: BSE2
Vacuum: 10 P
Beam: 50

Element	Concentration
O	63.59%
Na	0.20
Mg	0.55
Al	3.27
Si	10.03
S	1.21
K	1.02
Ca	19.31
Ti	0.16
Fe	0.65

EDS Spectrum with graph and list of elements detected

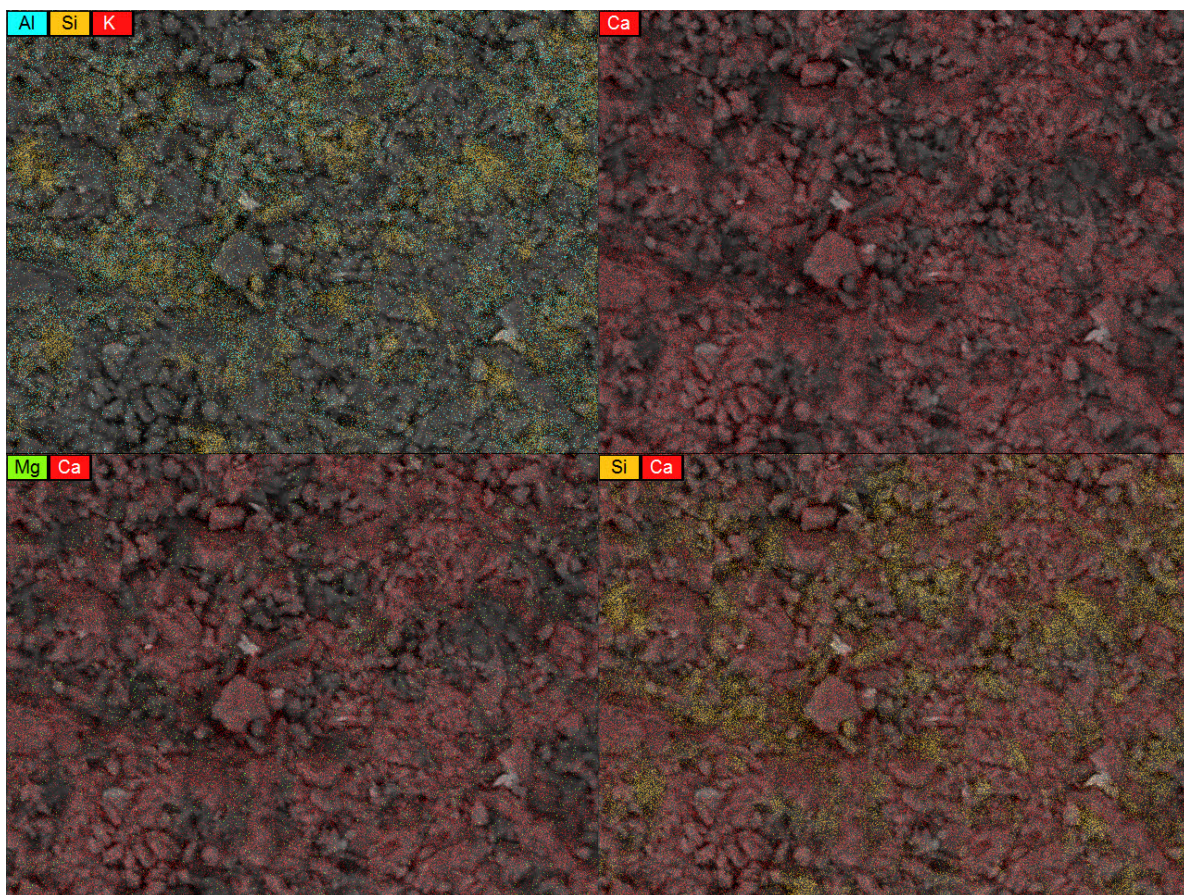
API# 3706720001, Shade Mt. No. 1 – 3800-3810 ft



API# 3706720001, Shade Mt. No. 1 – 3800-3810 ft

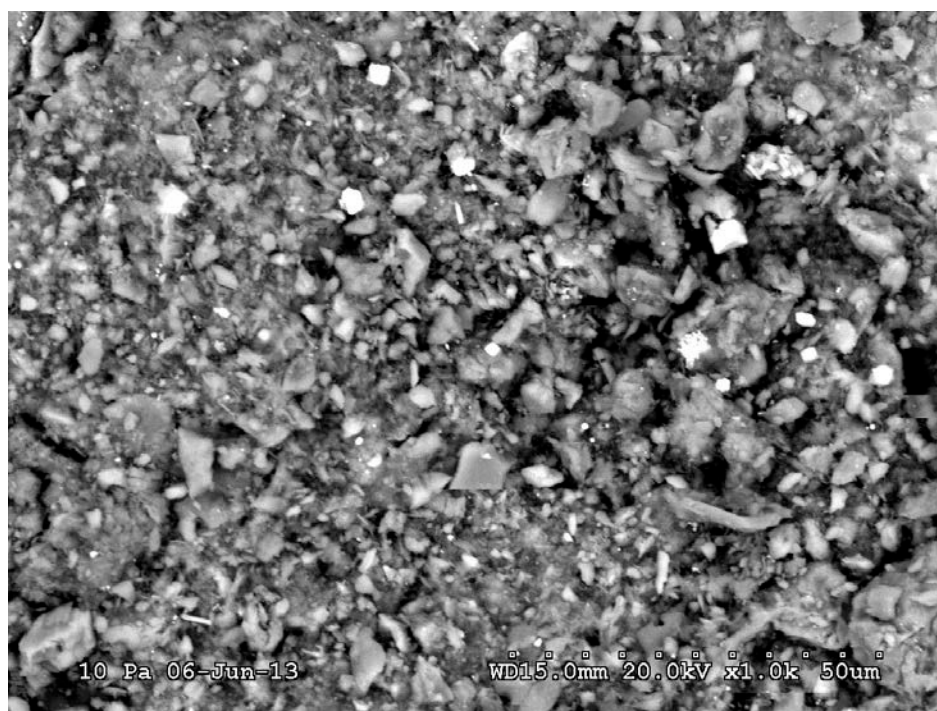


Individual element maps

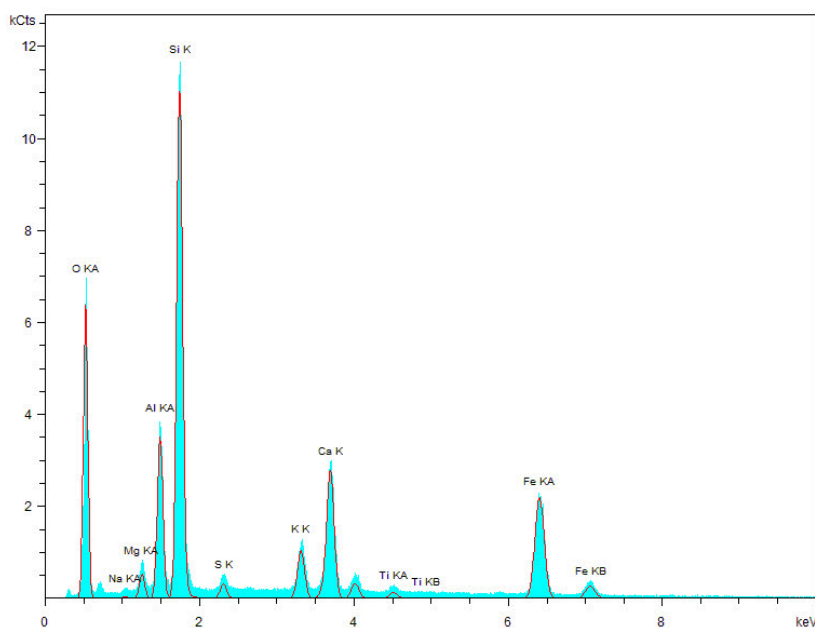


Multiple element maps

API# 3710320003, Commonwealth of PA Tr. 163 No. C-1 – 13,440-13,450 ft



S13-015-001

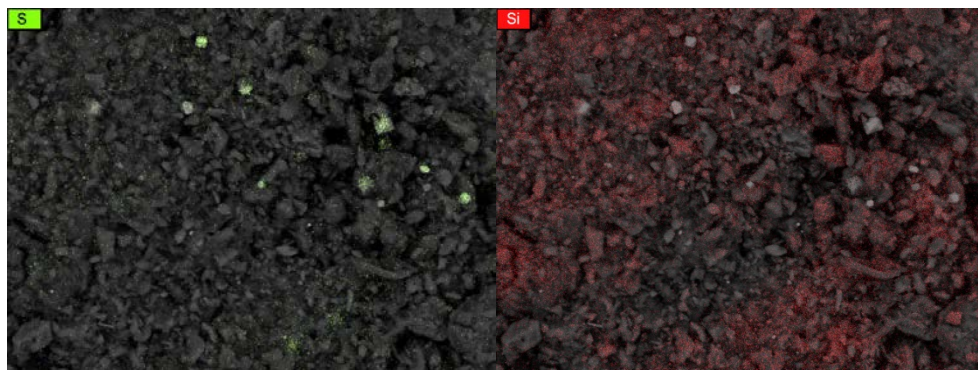
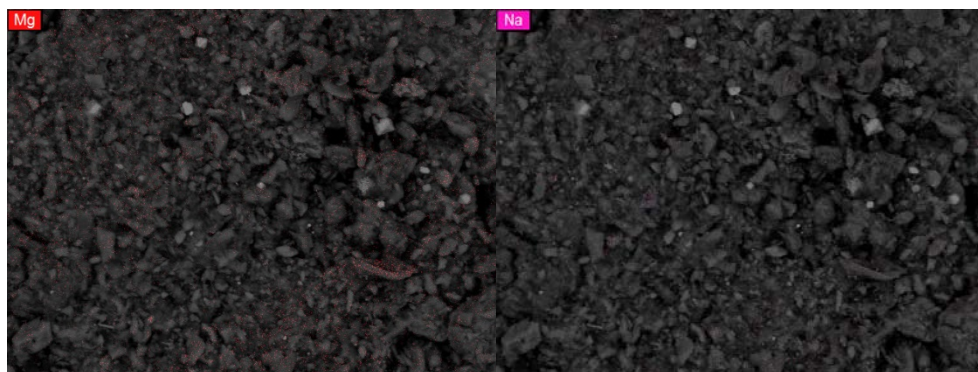
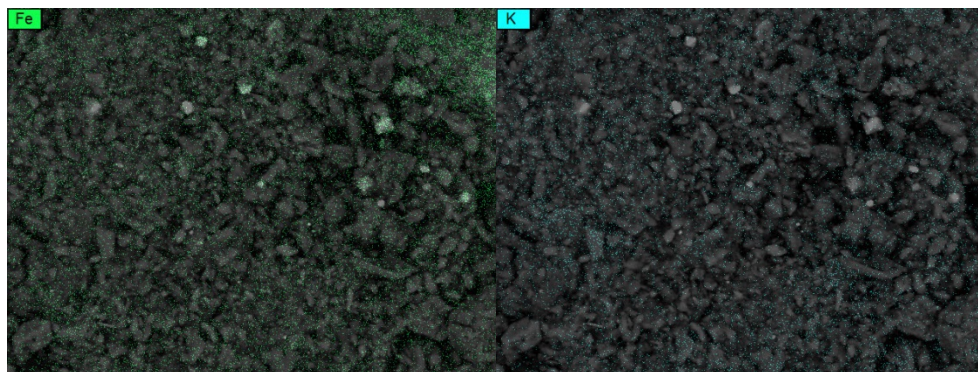
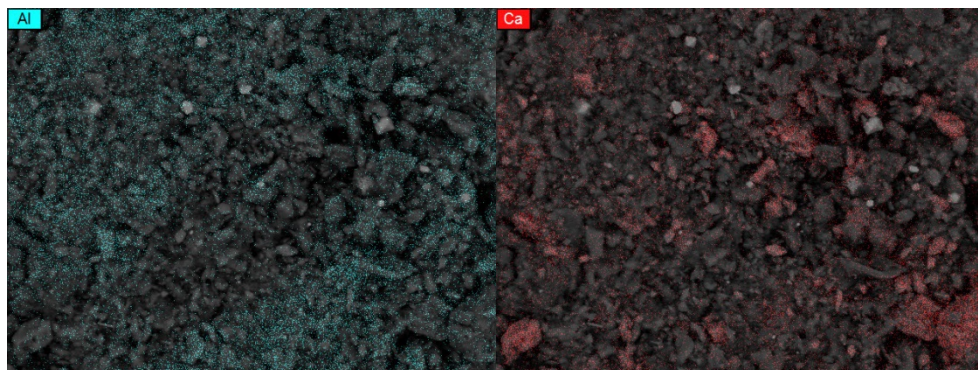


Data Number: 002129
Magnification: 1000
Accelerating Voltage: 20000 Volt
Emission Current: 65000 nA
Working Distance: 15000 um
Sub-Signal: BSE2
Vacuum: 10 P
Beam: 50

Element	Concentration
O	50.78 wt%
Na	0.16
Mg	1.21
Al	1.21
Si	18.93
S	0.63
K	2.19
Ca	6.35
Ti	0.40
Fe	13.31

EDS Spectrum with graph and list of elements detected

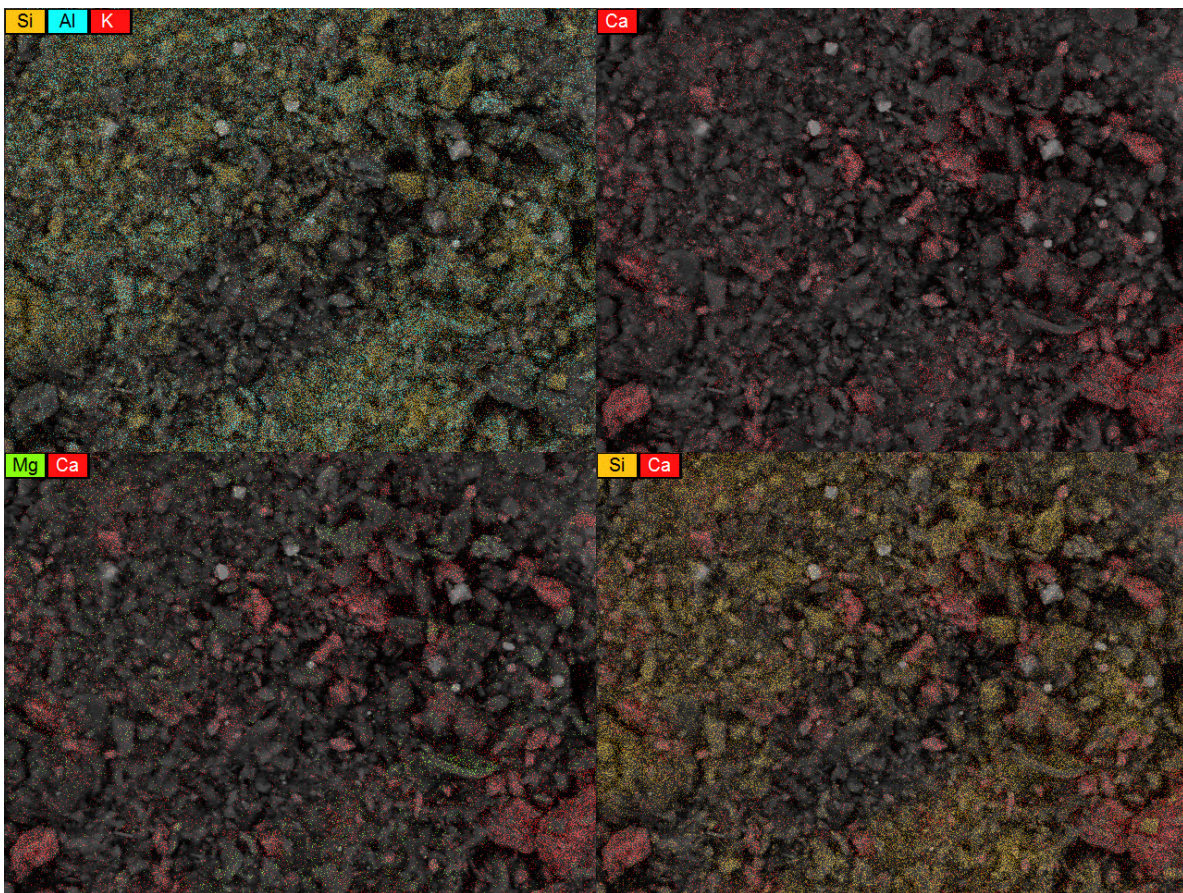
API# 3710320003, Commonwealth of PA Tr. 163 No. C-1 – 13,440-13,450 ft



API# 3710320003, Commonwealth of PA Tr. 163 No. C-1 – 13,440-13,450 ft



Individual element maps



Multiple element maps