

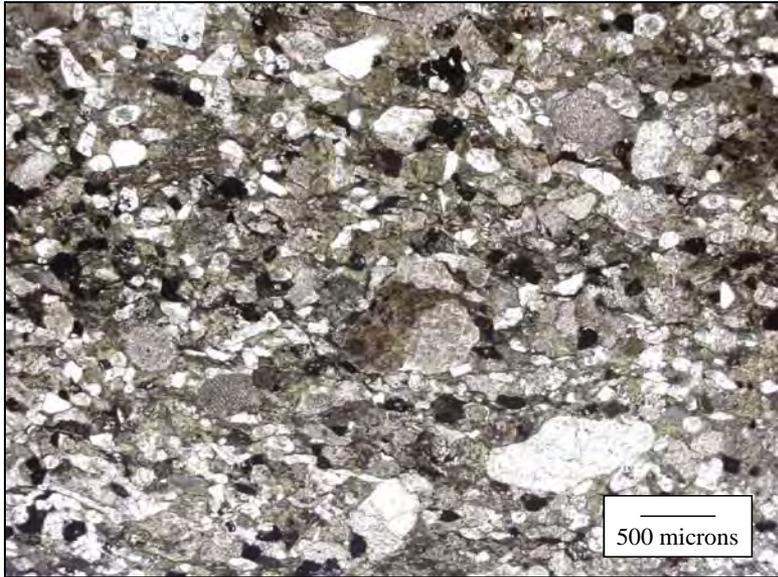
Thin Section and Scanning Electron Microscopy summary photographs from plugs taken from core of the Union Oil Company of California Trading Bay Unit M-29 (11,481.1' - 11,511.0'), along with photographs of the original core Marathon Collection at the Alaska GMC before and after the plugging



Received November 2008

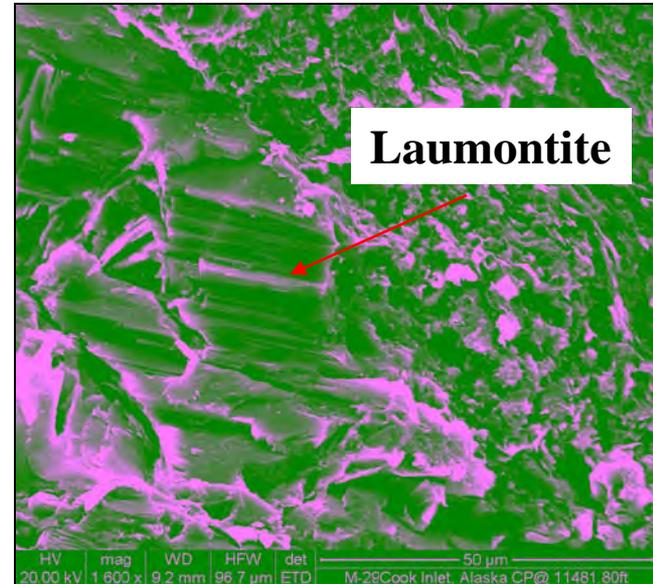
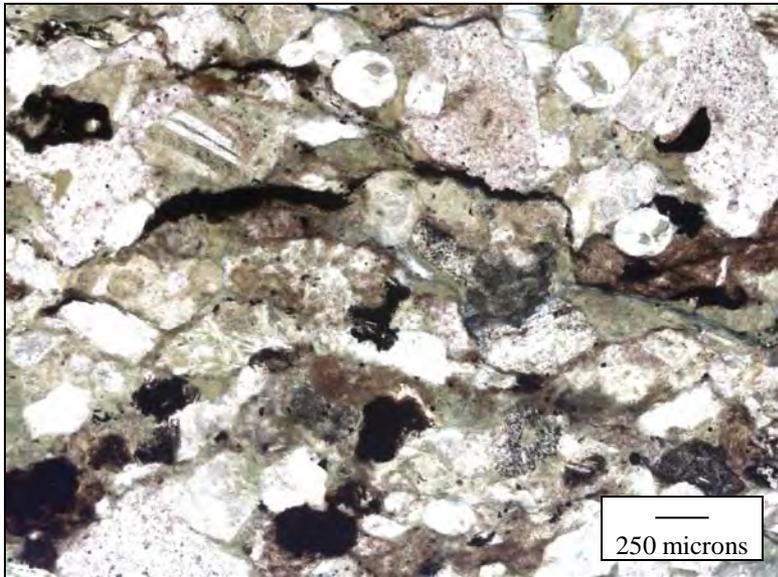
Alaska Geologic Materials Center Data Report No. 357

Total of 37 pages in report



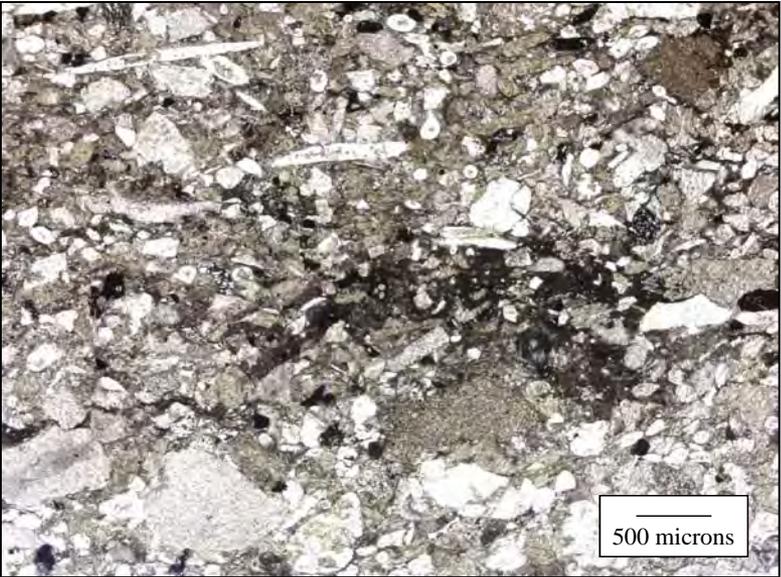
M-29: 11,481.1 ft

Strongly compacted, very poorly sorted, medium-grained, carbonaceous, fossiliferous, feldspathic-lithic (VRF) sandstone with abundant pseudomatrix, authigenic chlorites (cements & replacive) & replacive zeolites. Intercrystalline micropores – common. Effective porosity is lacking.



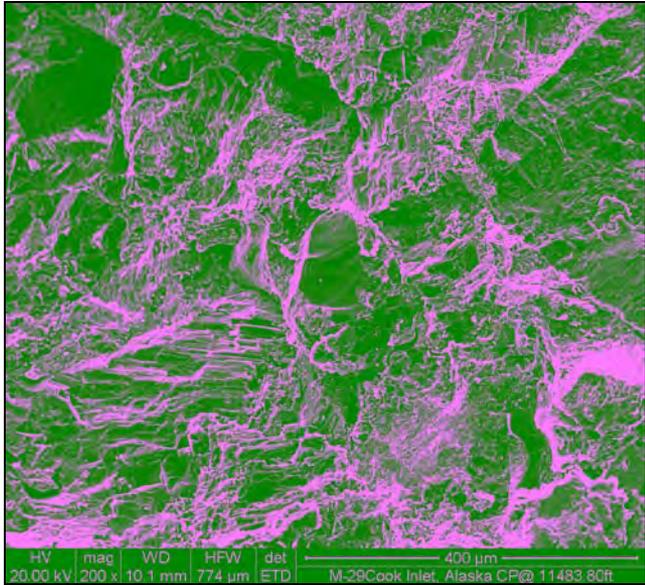
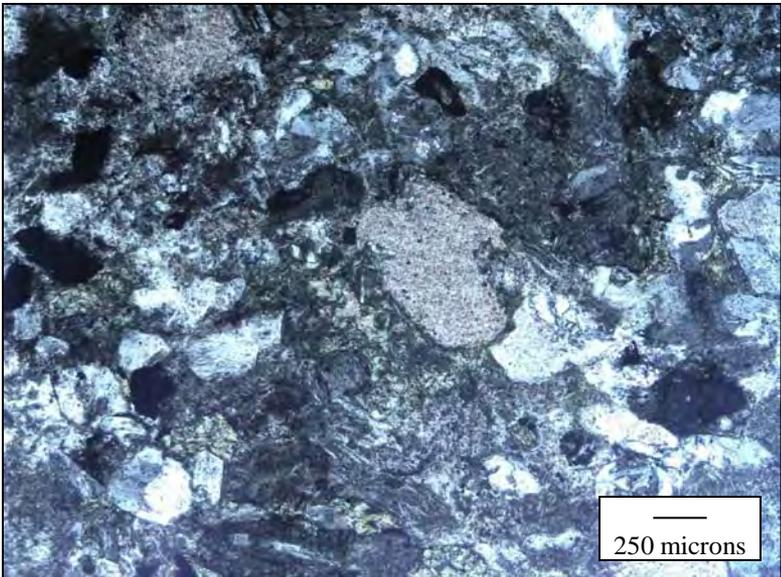
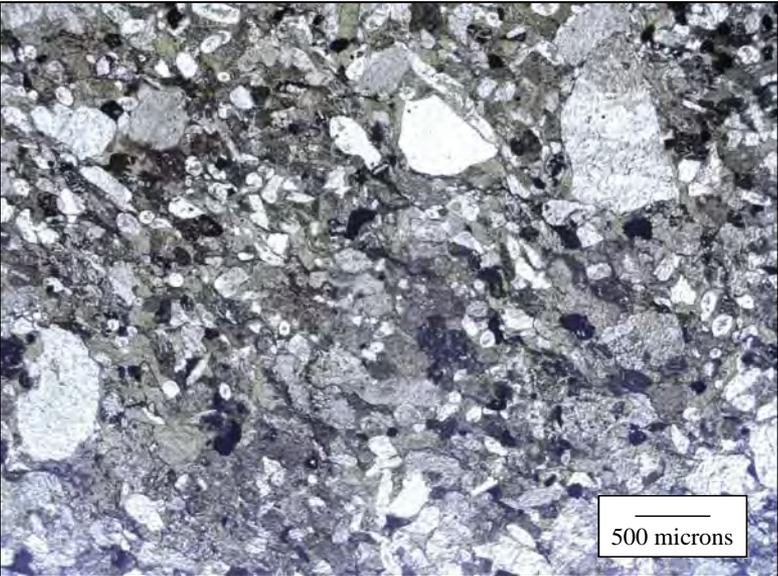
M-29: 11,482.6 ft

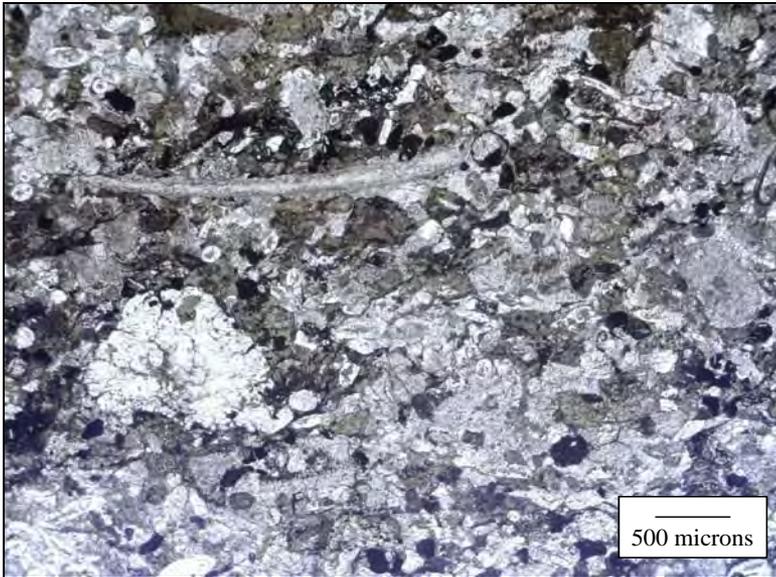
Strongly compacted, poorly sorted, fine-grained, fossiliferous, feldspathic-lithic (VRF) sandstone with abundant pseudomatrix, microstylolites & authigenic (replacive) chlorite & zeolites. Inter-crystalline microporosity – common. Effective porosity is absent.



M-29: 11,483.5 ft

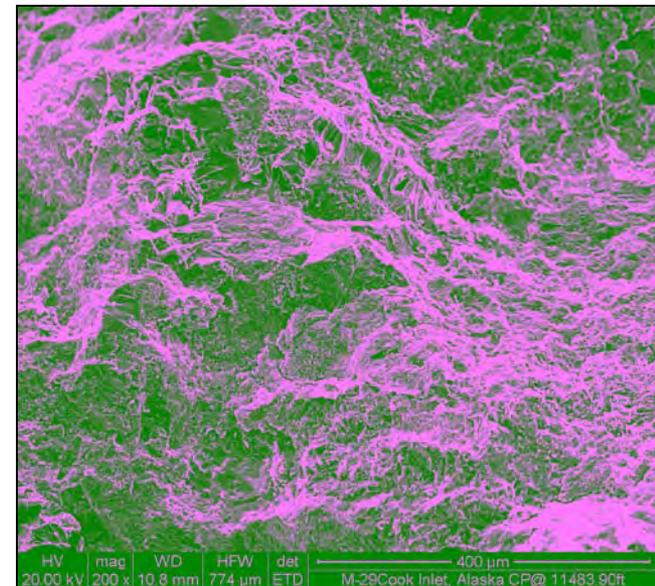
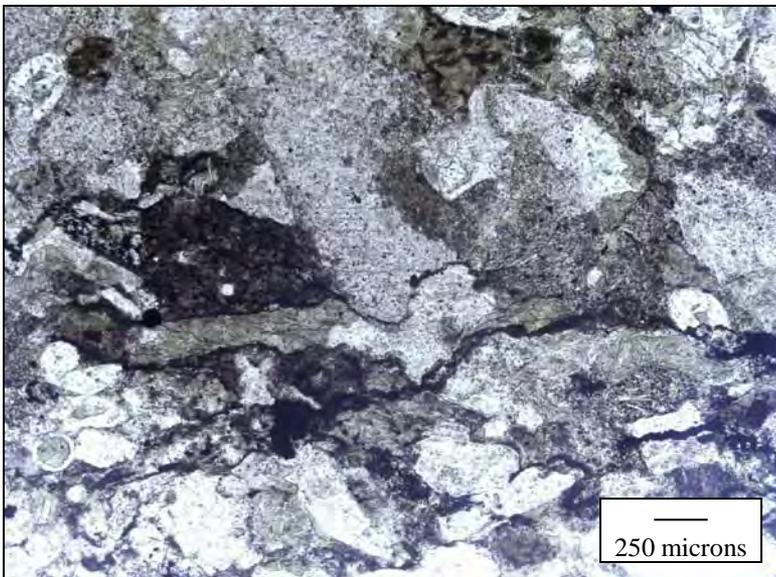
Strongly compacted, very poorly sorted, medium- to coarse- grained, fossiliferous, feldspathic-lithic (VRF) sandstone with abundant pseudomatrix, authigenic chlorite (cements & replacive) & replacive zeolites. Effective porosity is lacking.

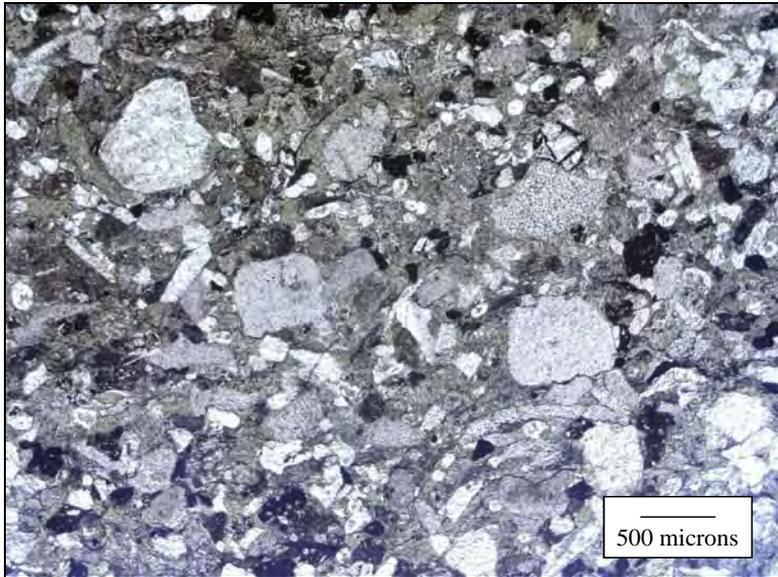




M-29: 11,483.9 ft

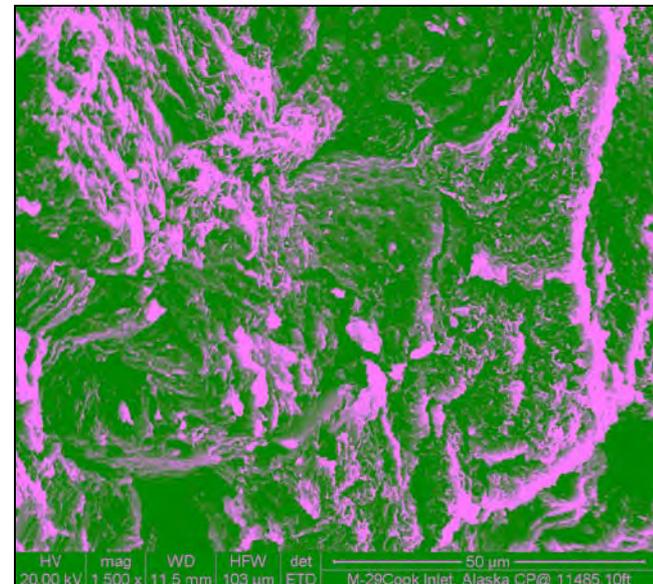
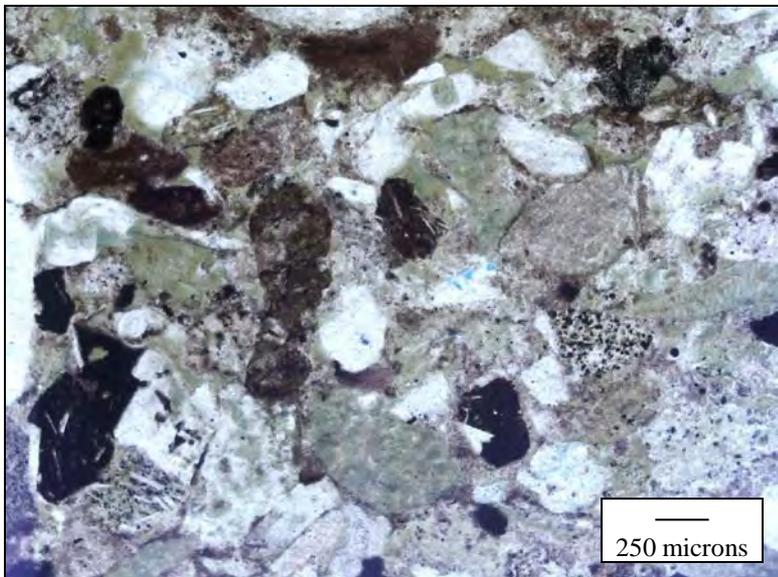
Strongly compacted, moderately sorted, fine- to medium-grained, very fossiliferous, feldspathic-lithic (VRF) sandstone with pseudomatrix, authigenic chlorites (cements & replacive) & replacive zeolites. Micro-sutured grain contacts abundant. Intercrystalline micropores – common. Effective porosity is absent.





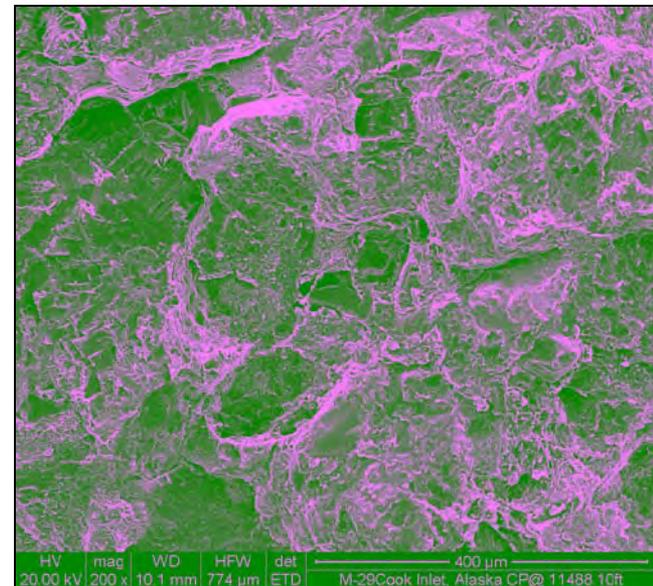
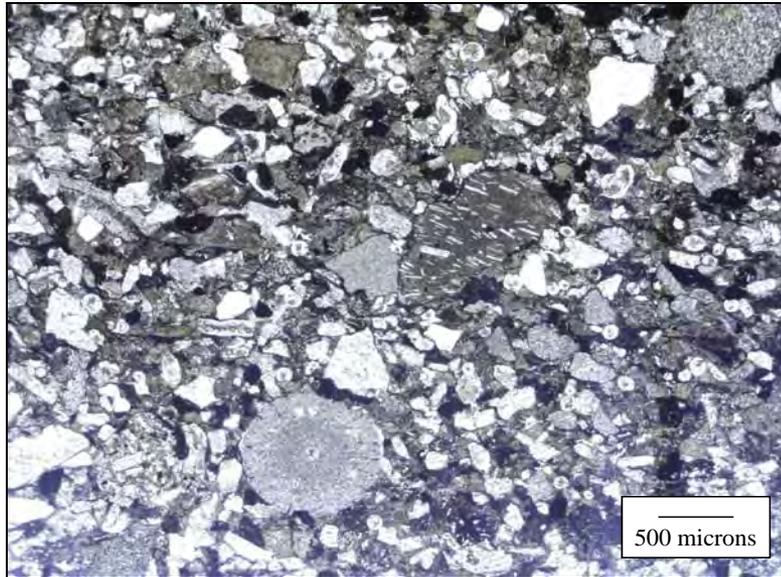
M-29: 11,485.1 ft

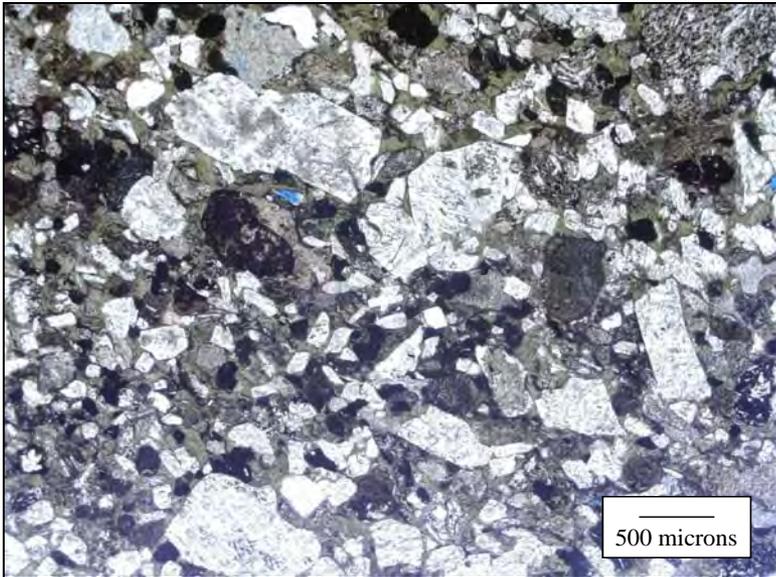
Strongly compacted, moderately sorted, fine- to medium-grained, fossiliferous, feldspathic-lithic (VRF) sandstone with abundant authigenic chlorites (cements & replacements) & replacive zeolites. Intercrystalline micropores, isolated grain molds & cemented microfractures - present. Effective porosity is lacking.



M 29: 11,486.3 ft

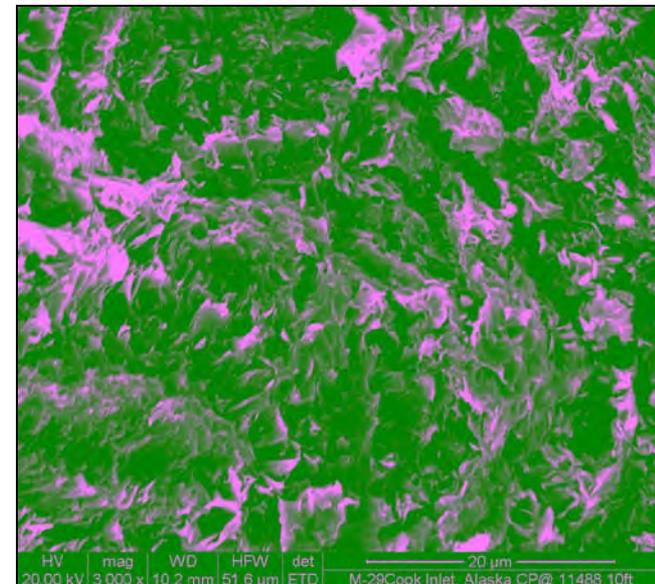
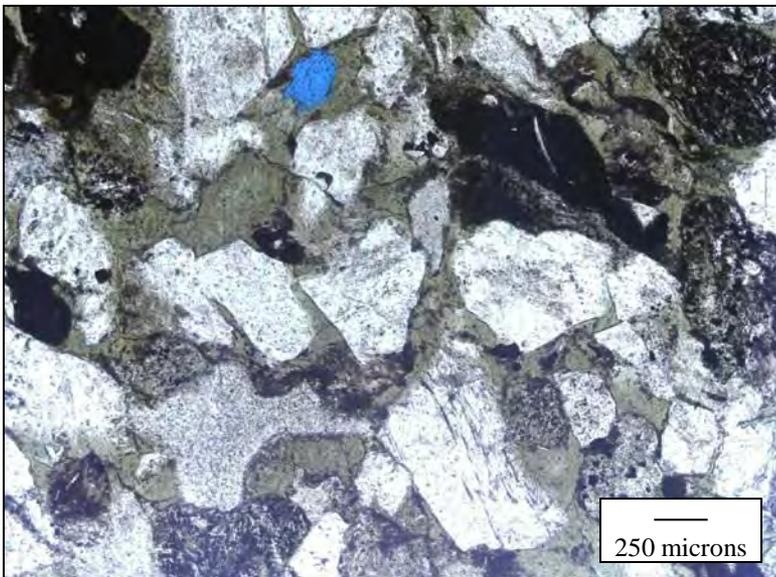
Strongly compacted, very poorly sorted, medium- grained, fossiliferous, feldspathic-lithic (VRF) sandstone with abundant pseudomatrix, authigenic chlorite (cements & replacive), other clay minerals & replacive zeolites. Intercrystalline micro-porosity – common. Effective porosity absent.





M-29: 11,488.1 ft

Strongly compacted, moderately sorted, medium-grained, chlorite cemented, feldspathic-lithic (VRF) sandstone with pervasive replacement by zeolites, chlorite & calcite. Intercrystalline micropores (abundant); isolated grain molds & cemented microfractures- present. Effective pore network is lacking.



M-29: 11,489.5 ft

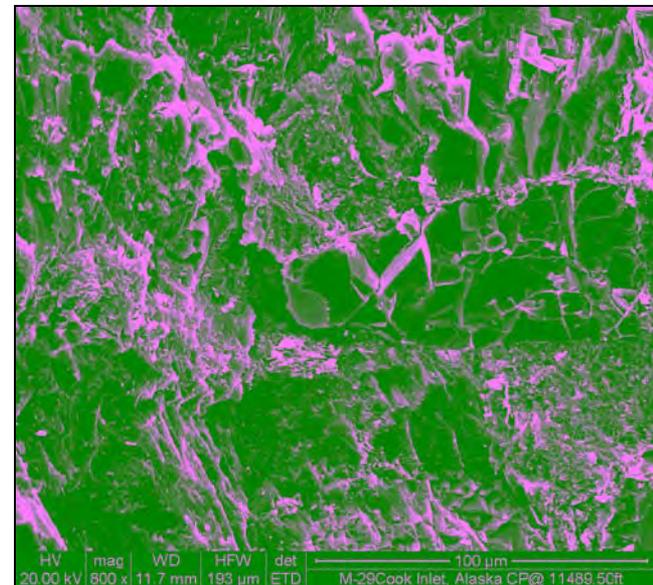
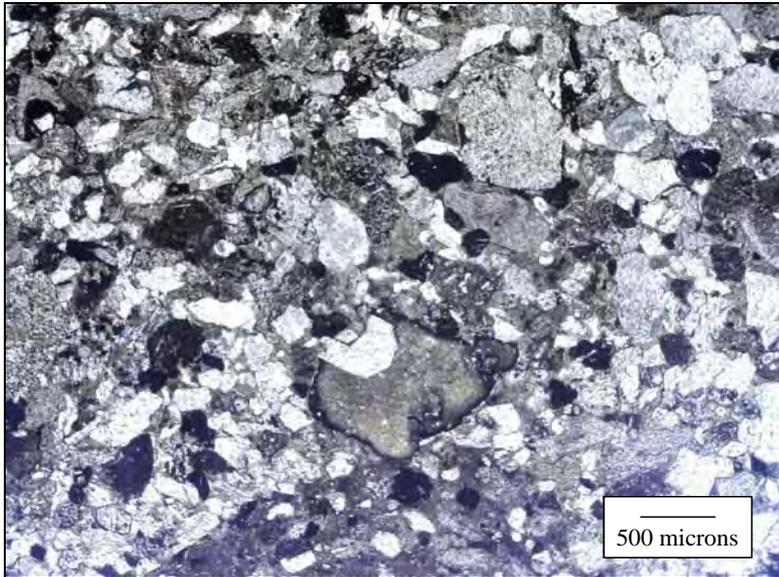
Strongly compacted, poorly sorted, fine- to medium-grained, feldspathic-lithic (VRF) sandstone with abundant authigenic chlorite (cements & replacements) & replacive zeolites.

Hematite replacement is pervasive.

Microstylolitic grain contacts abundant.

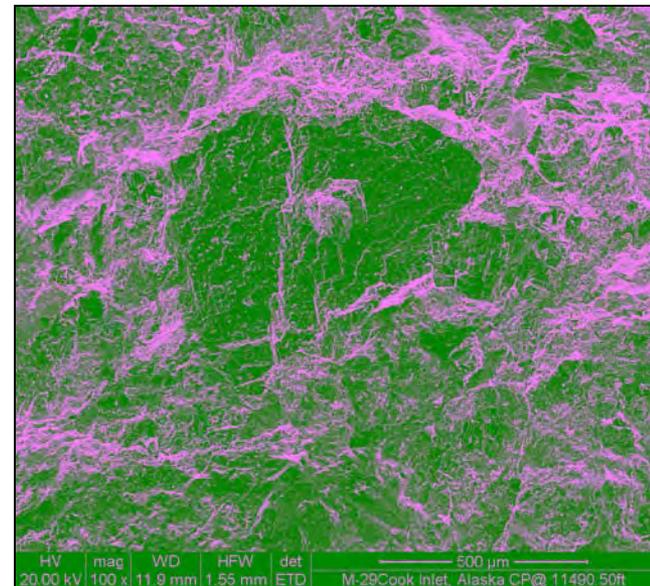
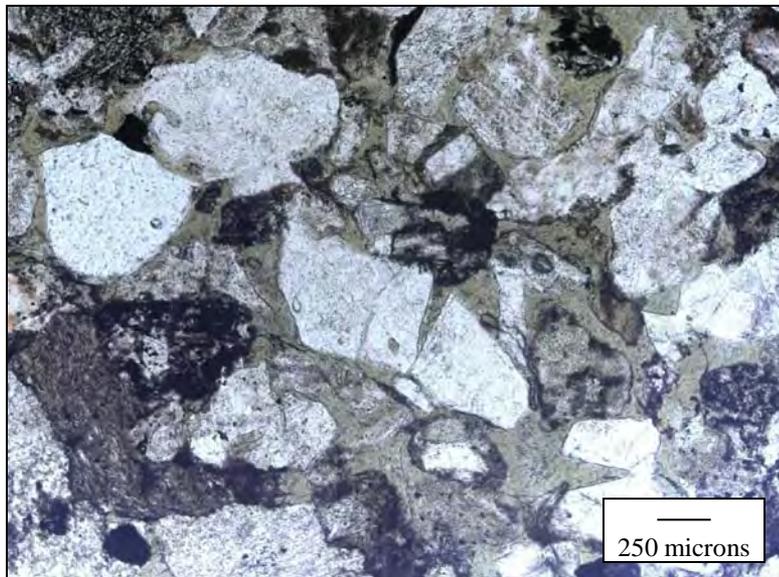
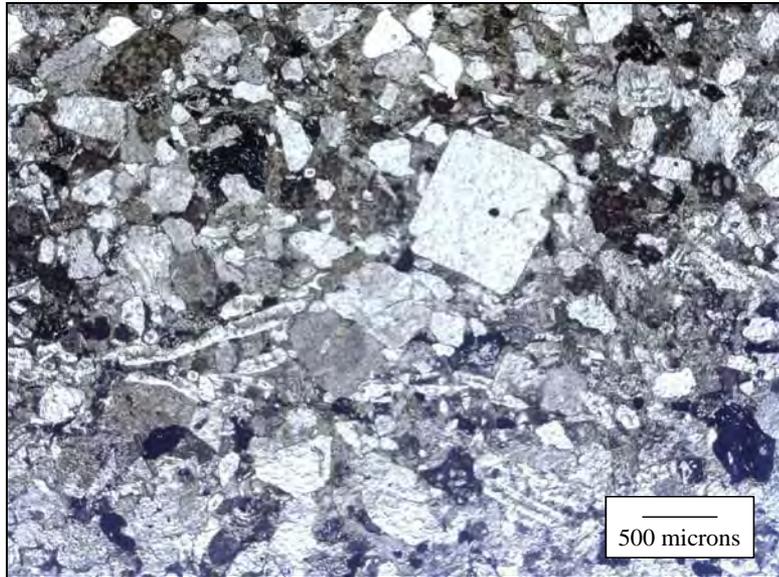
Intercrystalline microporosity - scattered.

Effective porosity is absent.



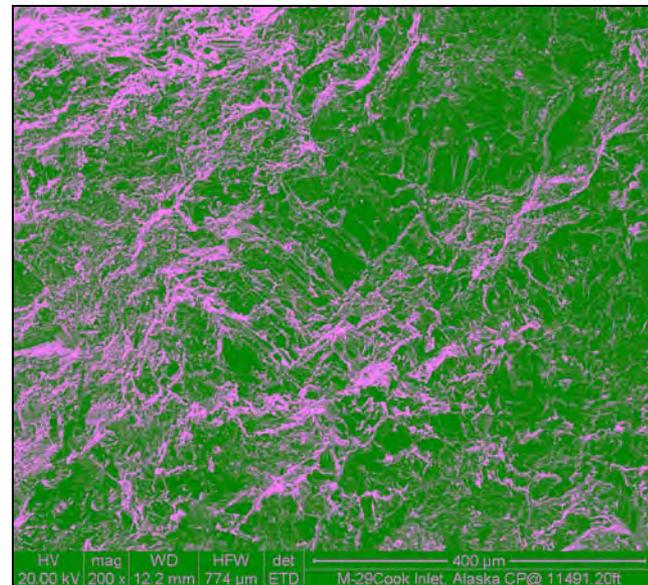
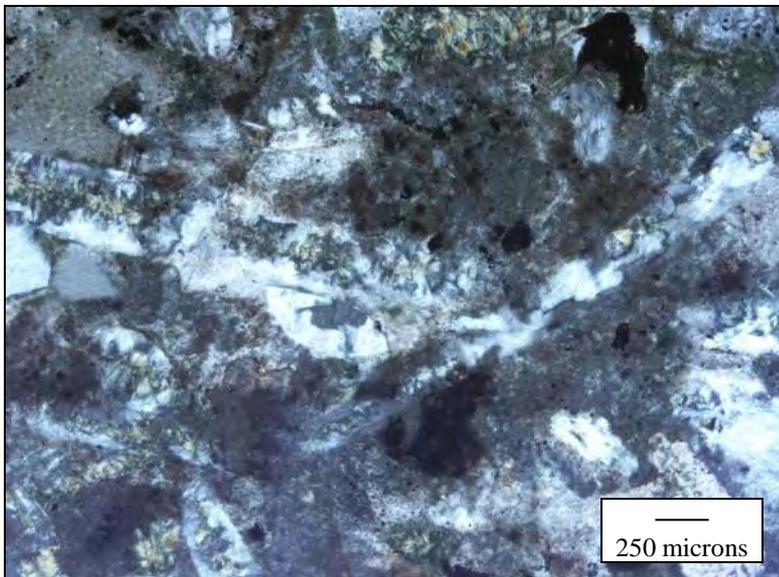
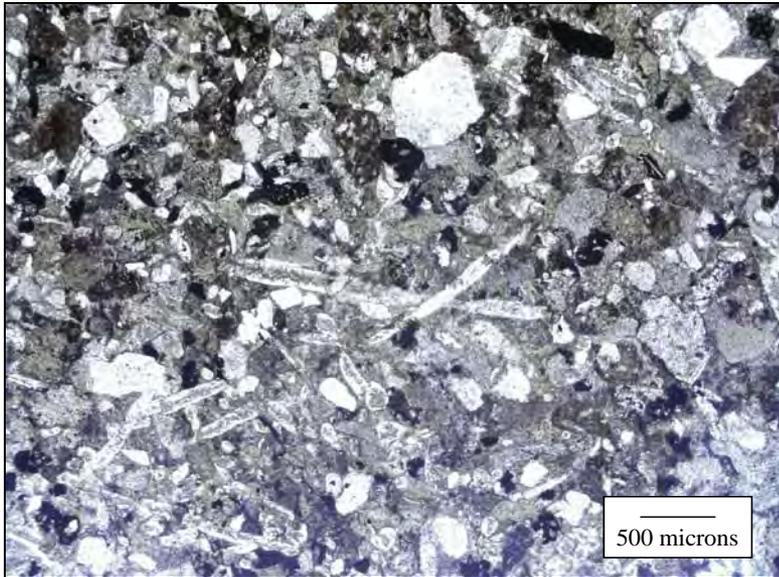
M-29: 11,490.5 ft

Moderately compacted, moderately sorted, medium-grained, chlorite cemented, feldspathic-lithic (VRF) sandstone with pervasive replacement by zeolites, clays & calcite. Intercrystalline micropores - abundant & chlorite-cemented microfractures evident. Effective porosity absent.



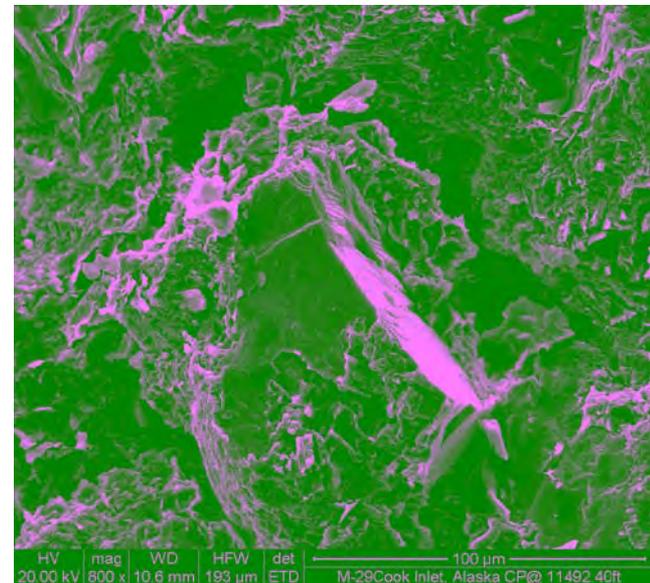
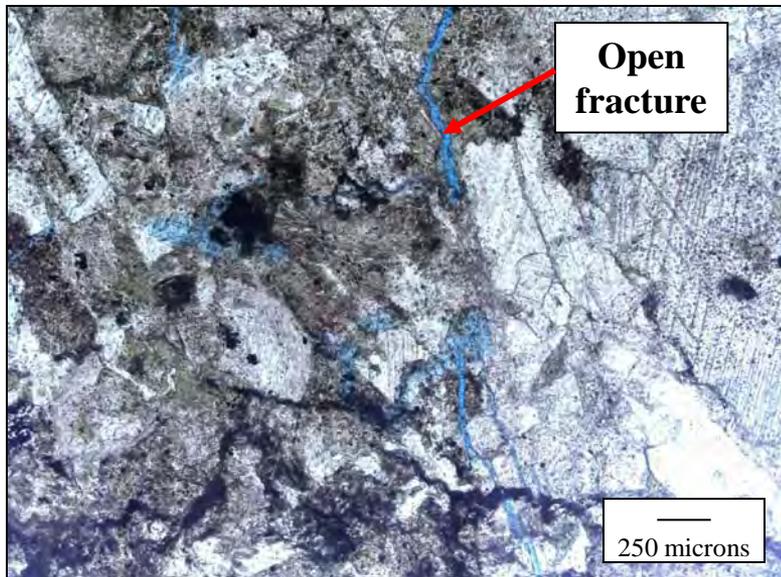
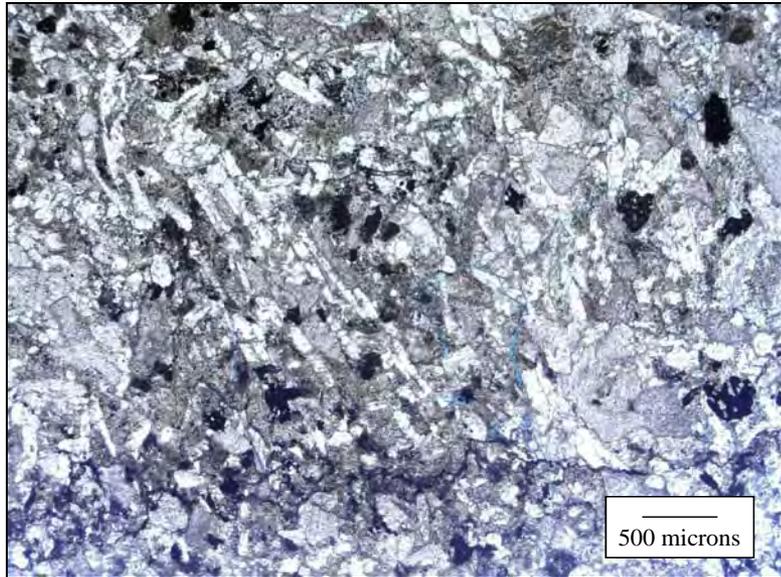
M-29: 11,491.2 ft

Strongly compacted, moderately sorted, fine-grained, feldspathic-lithic (VRF) sandstone. Chlorite cemented with abundant microstylolitic fabrics & pervasive replacement by clay minerals & zeolites (mainly laumontite). Intercrystalline microporosity – common. Effective porosity is lacking.



M-29: 11,492.4 ft

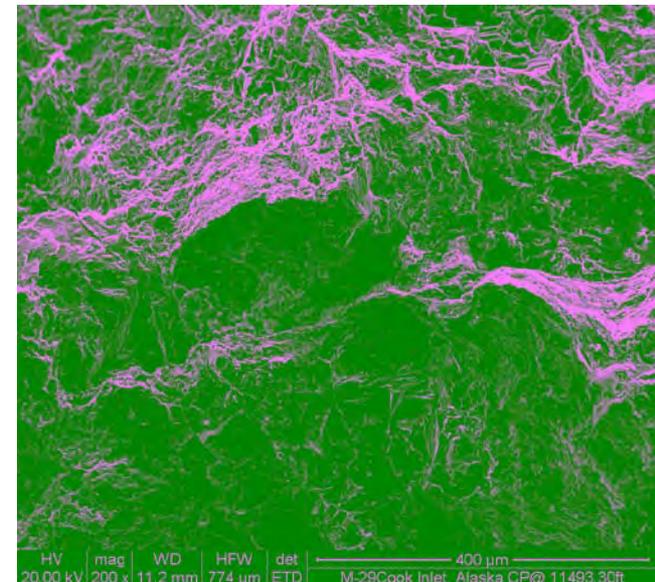
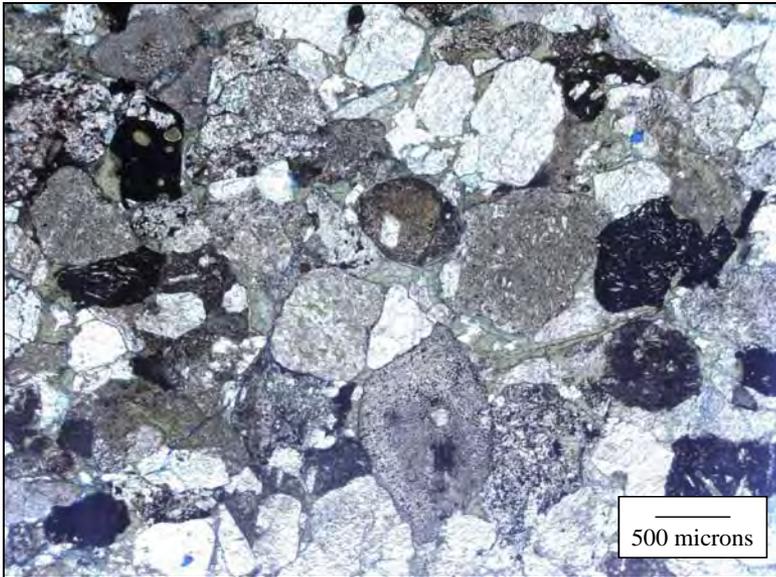
Strongly compacted, moderately well sorted, very fine-grained, chlorite cemented, feldspathic-lithic (VRF) sandstone with pervasive replacement by zeolites, chlorite & calcite. Intercrystalline microporosity (abundant); vertical open & chlorite-cemented microfractures associated with stylolites. Dissolution is evident along margins of fractures. Effective porosity limited to fractures.



M-29: 11,493.3 ft

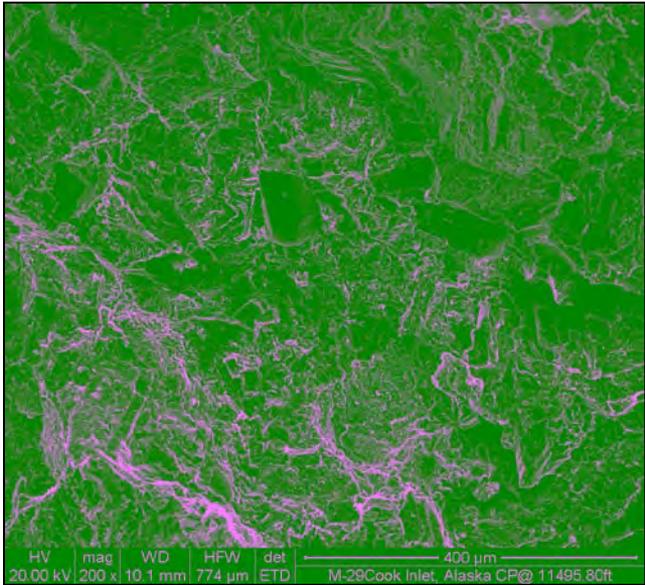
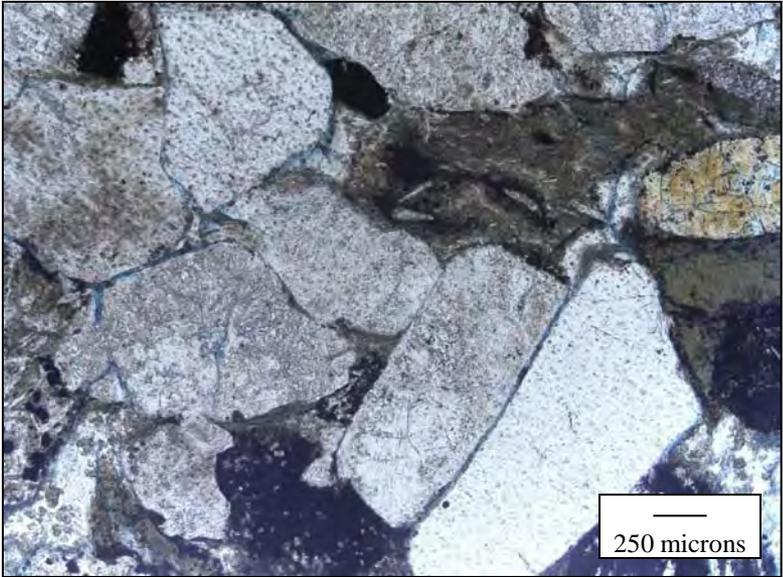
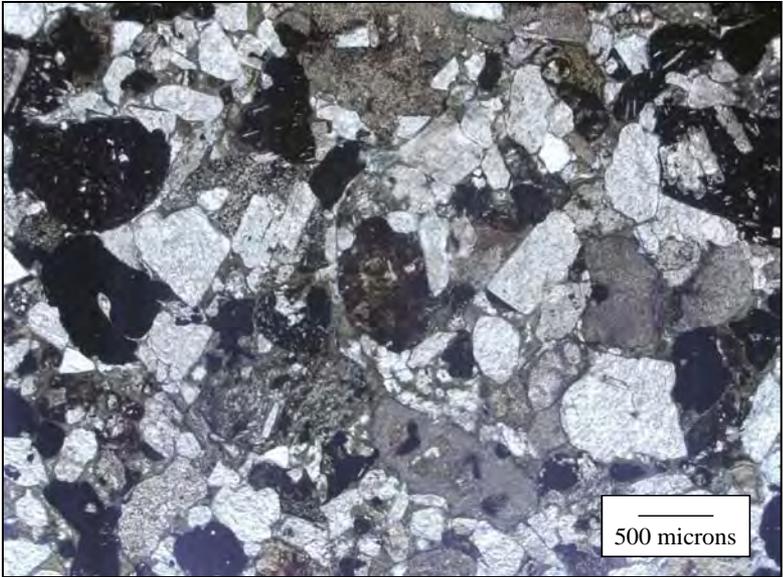
Densely compacted, poorly sorted, medium- grained, fossiliferous, chlorite-cemented feldspathic-lithic (VRF) sandstone with pseudomatrix, authigenic clays (cements & replacements) & zeolites.

Microstylolitic grain contacts well developed. Intercrystalline micropores & open, sub-horizontal microfractures present. Effective porosity restricted to fractures.



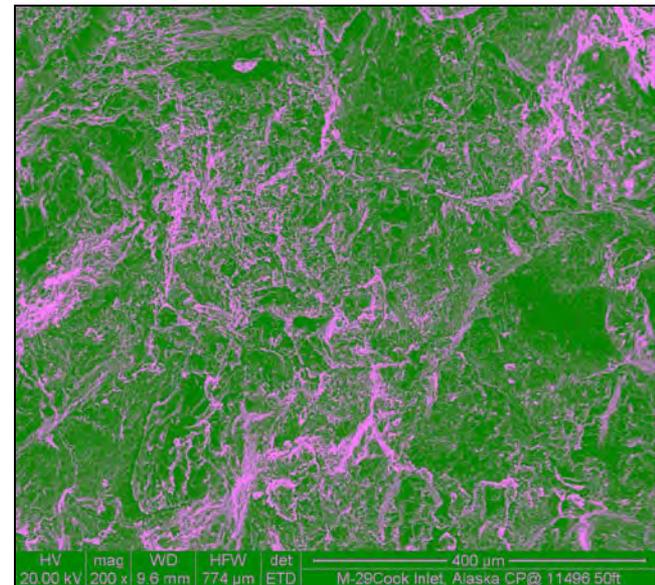
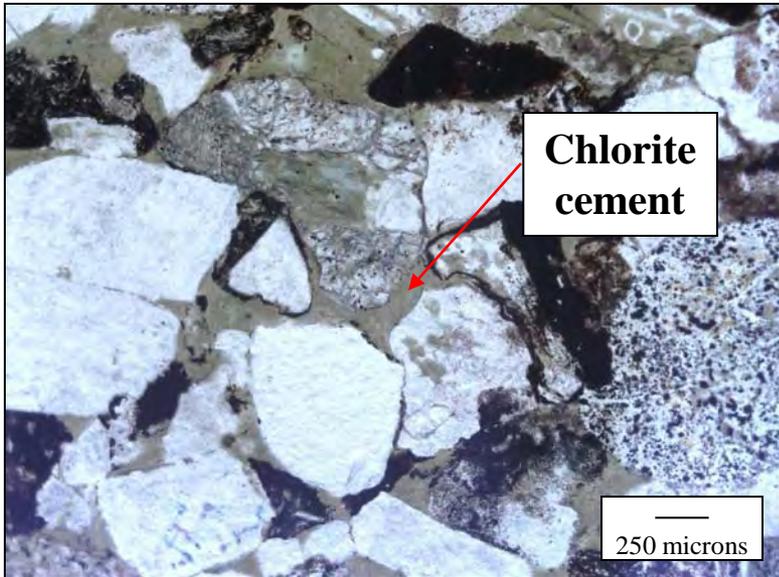
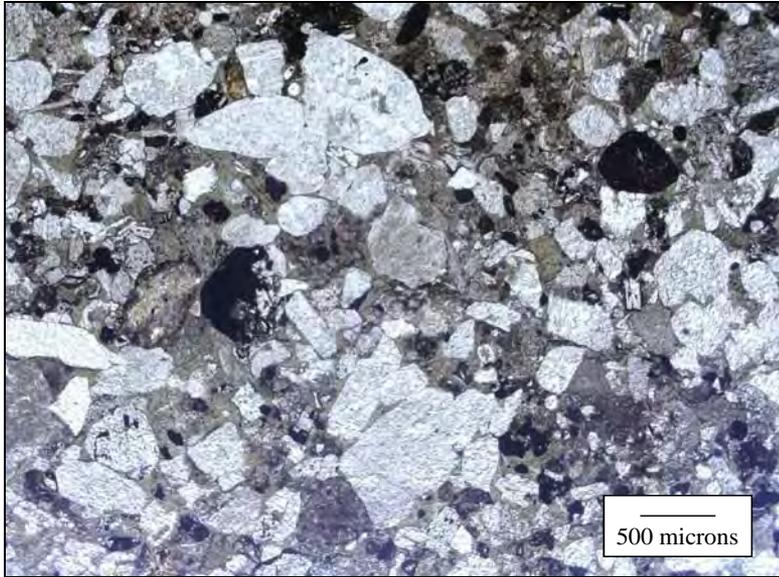
M-29 : 11,495.8 ft

Moderately compacted, moderately sorted, medium-grained, fossiliferous, chlorite cemented, feldspathic-lithic (VRF) sandstone with pervasive replacement by zeolites & clay minerals. Intercrystalline micropores - abundant & chlorite-cemented microfractures- present. Effective porosity absent.



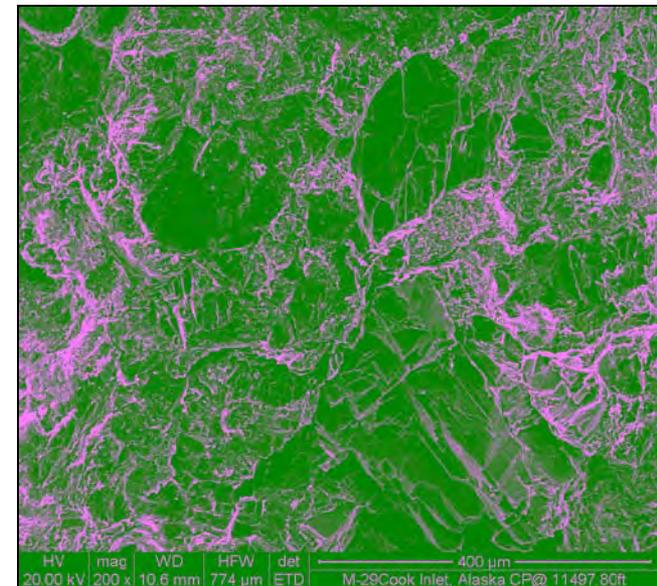
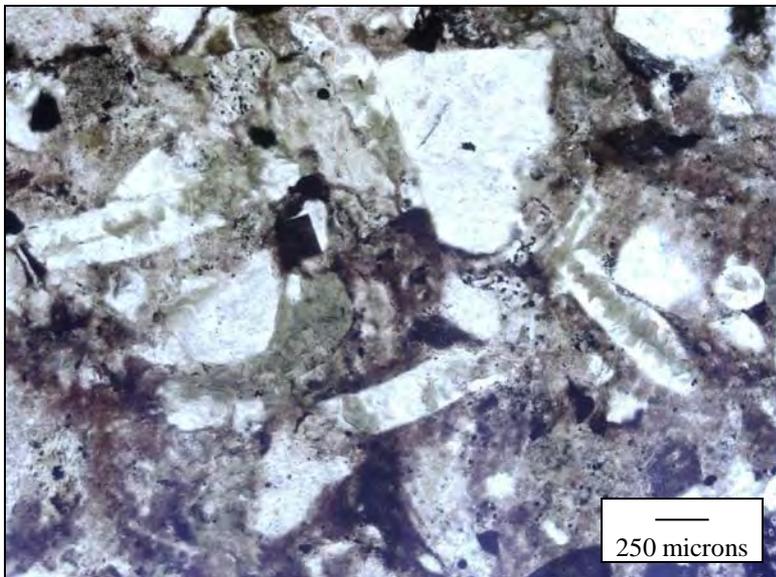
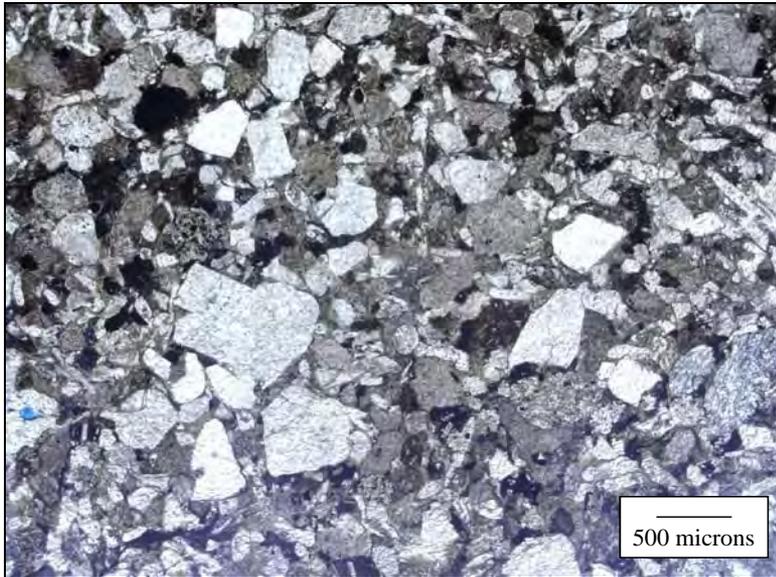
M-29 : 11,496.5 ft

Moderately compacted, poorly sorted, medium-grained, chlorite cemented, feldspathic-lithic (VRF) sandstone with pervasive replacement by zeolites, chlorite & calcite. Intercrystalline micropores - abundant; grain molds - scattered. Hematite replacement – common. No effective porosity.



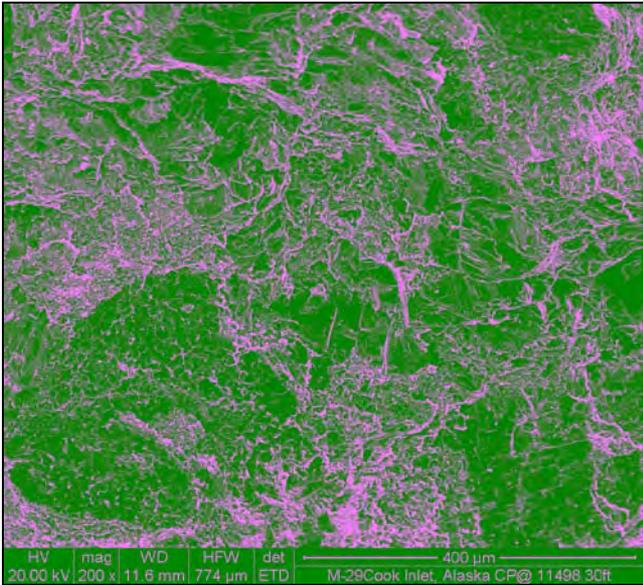
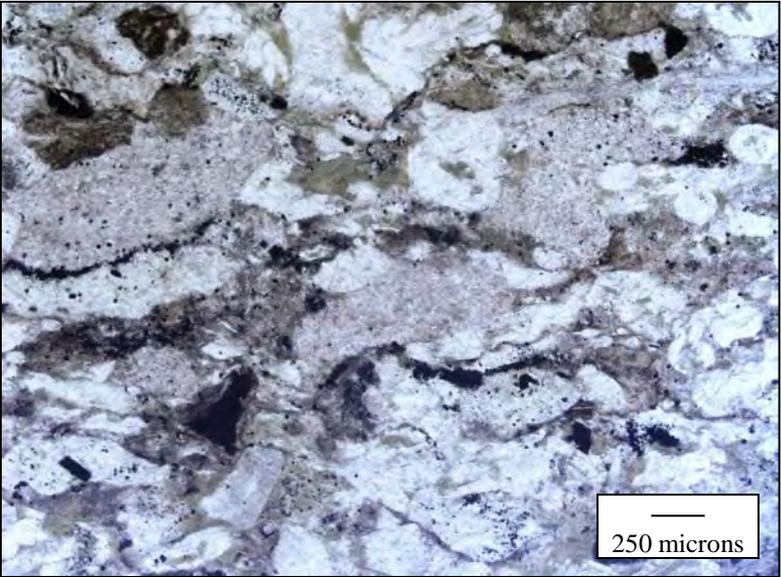
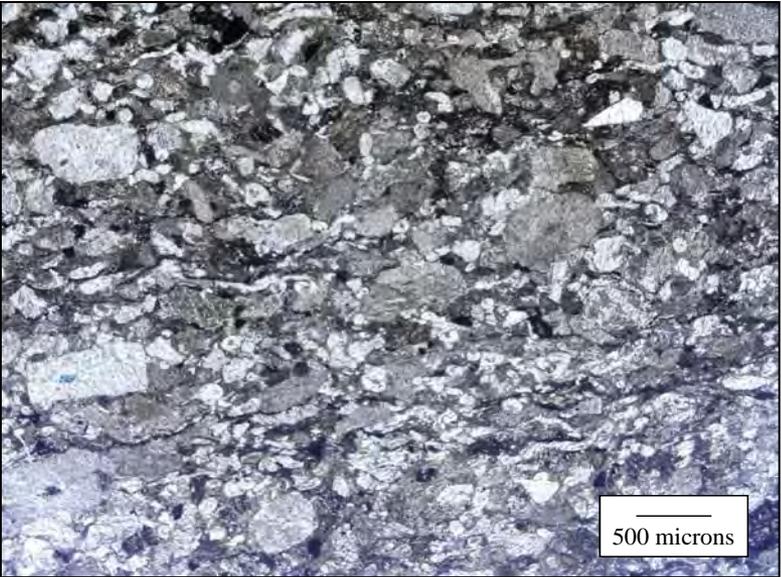
M-29: 11,497.8 ft

Moderately compacted, poorly sorted, fine- to medium-grained, feldspathic-lithic (VRF) sandstone with abundant chlorite cements with replacive zeolites & clays. Microstylolitic grain contacts developed on larger grains. Intercrystalline microporosity - common. Effective porosity is absent.



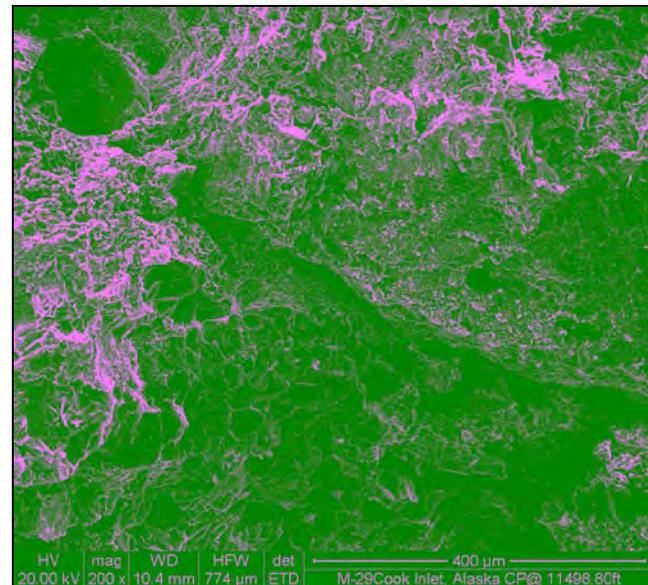
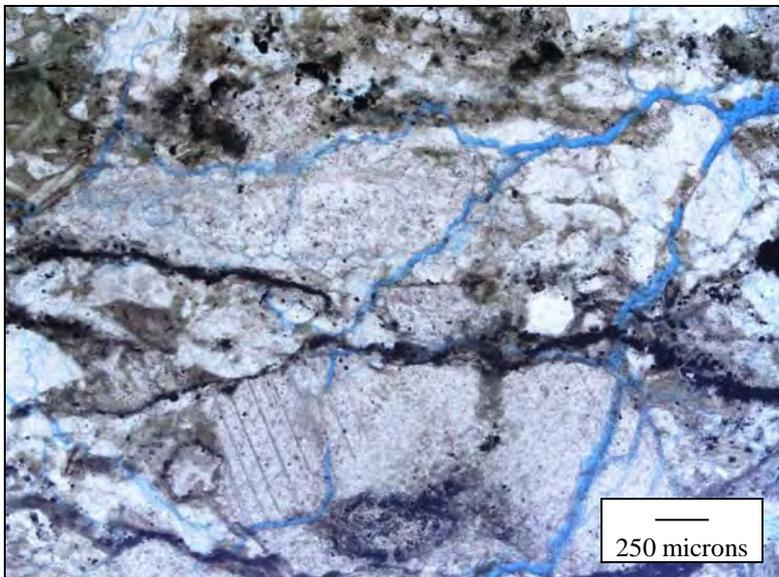
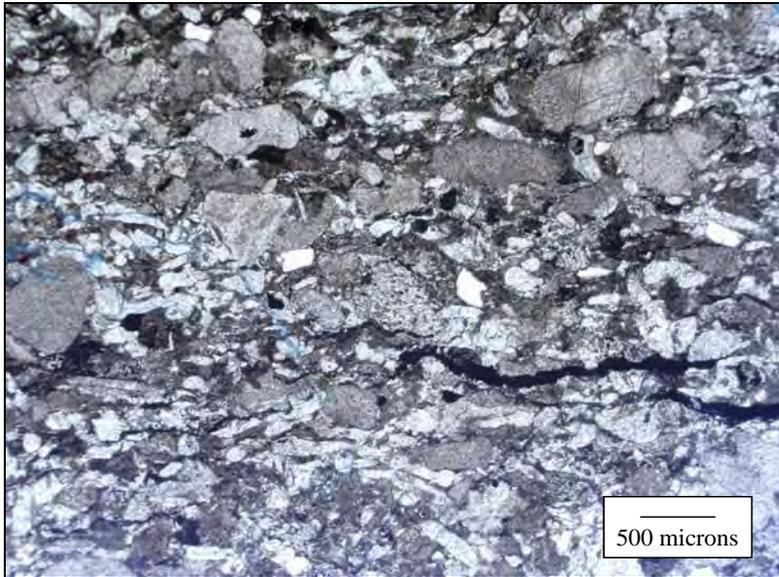
M-29 : 11,498.3 ft

Pervasively microstylolitized, poorly sorted, fine-grained, carbonaceous, fossiliferous, lithic-feldspathic sandstone with pseudomatrix, chlorite cements & replacive zeolites. Intercrystalline microporosity – abundant. No effective porosity.



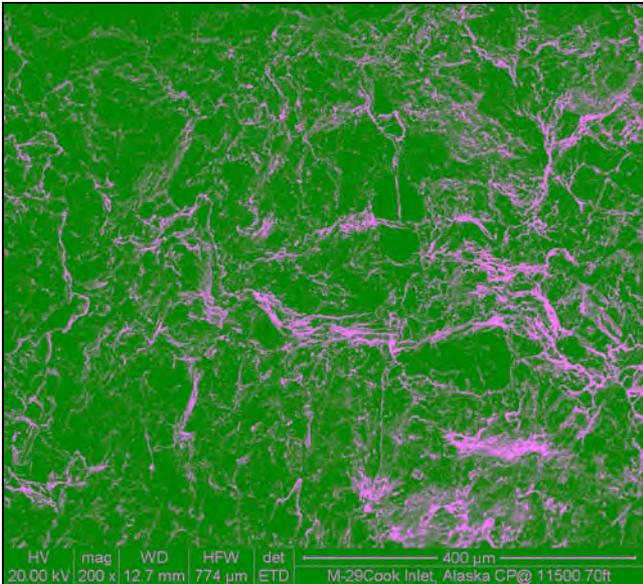
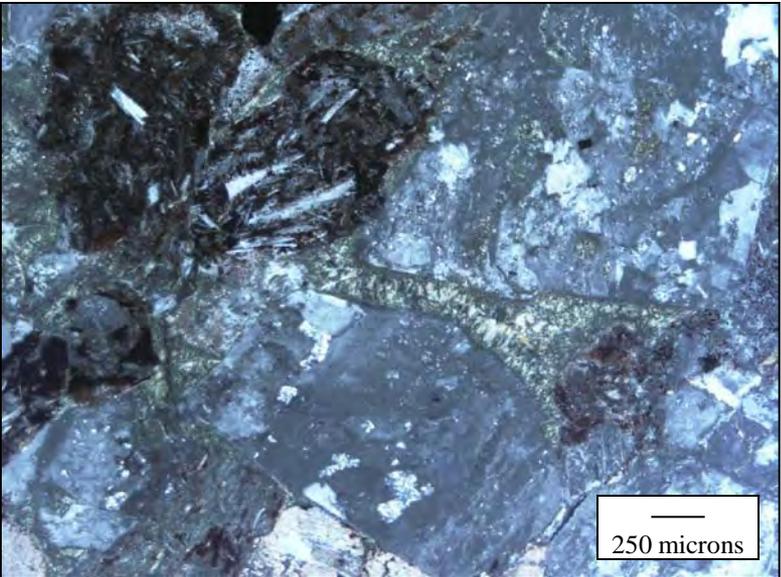
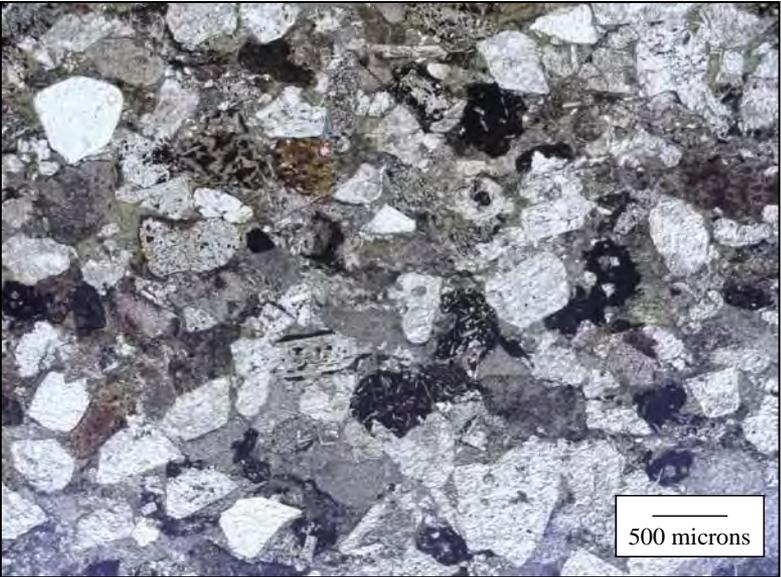
M-29: 11,498.8 ft

Pervasively microstylolitized, poorly sorted, medium-grained, carbonaceous, fossiliferous, feldspathic sandstone with scattered pseudo-matrix, authigenic chlorite cements & replacive zeolites. Intercrystalline microporosity – abundant. Sample transected by open, horizontal to oblique microfractures. Effective porosity restricted to fracture network.



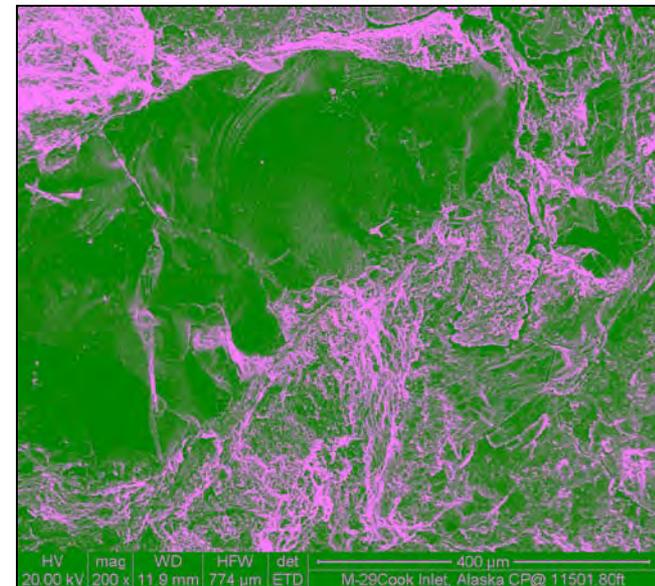
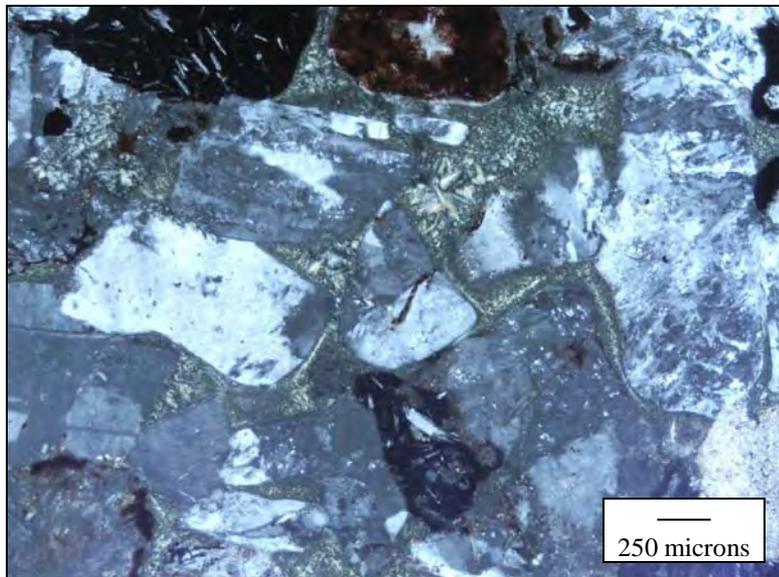
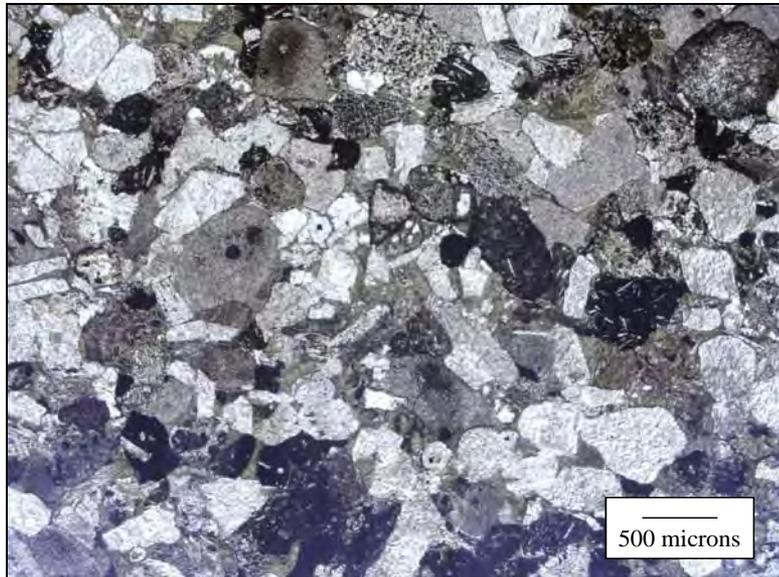
M-29: 11,500.7 ft

Moderately compacted, moderately well sorted, medium-grained, chlorite cemented, feldspathic-lithic (VRF) sandstone with pervasive replacement by zeolites & clay minerals. Intercrystalline micropores - abundant & chlorite-cemented microfractures- evident. Effective porosity absent.



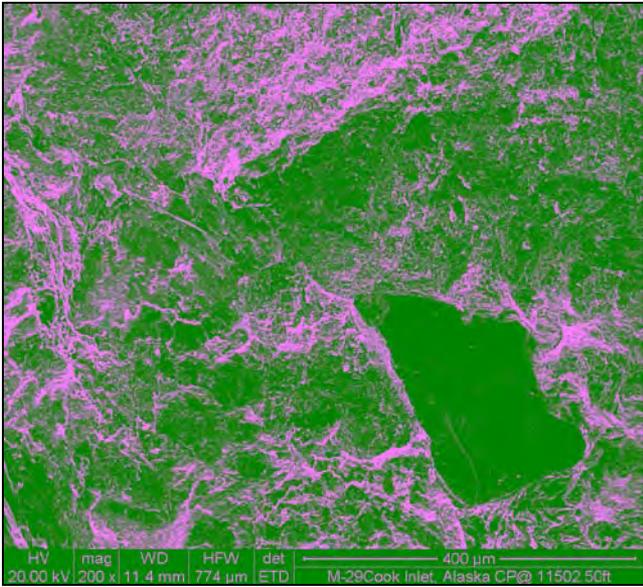
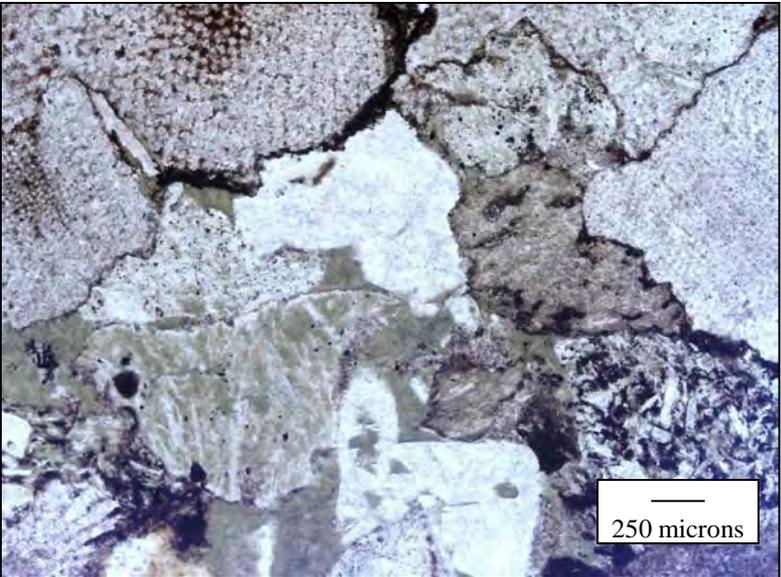
M-29 : 11,501.8 ft

Moderately compacted, moderately sorted, medium-grained, fossiliferous, chlorite cemented, feldspathic-lithic (VRF) sandstone with pervasive replacement by zeolites & clay minerals. Intercrystalline micropores - abundant. Effective porosity lacking.



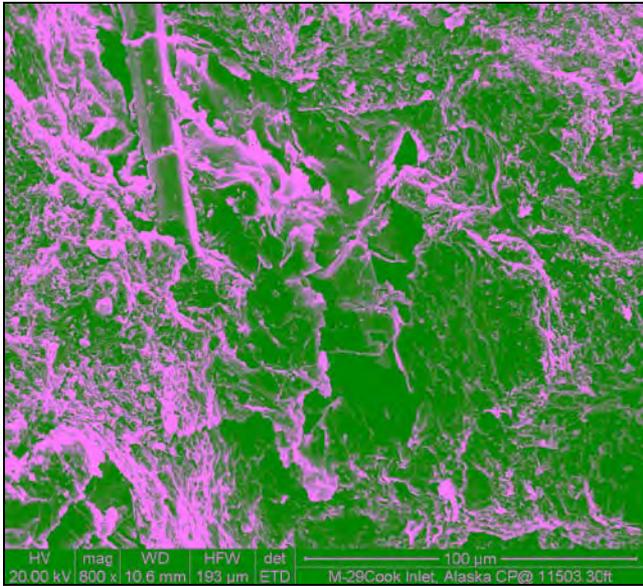
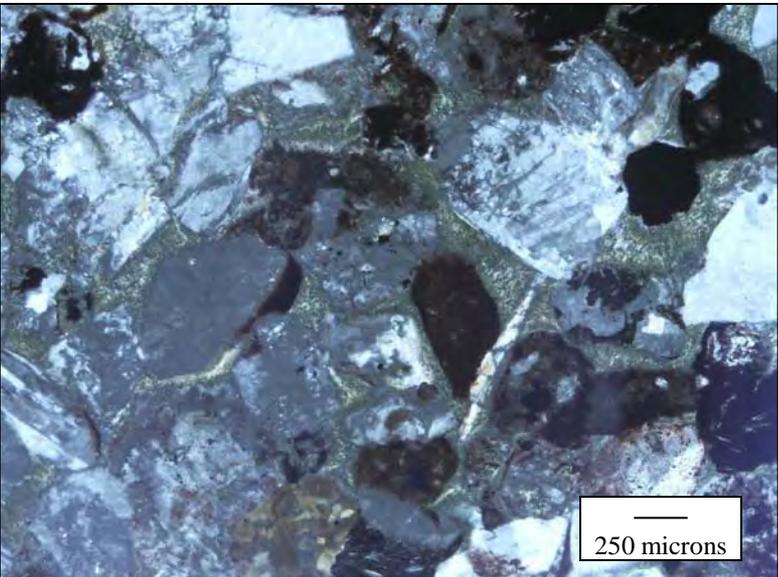
M-29 : 11,502.5 ft

Densely compacted, moderately sorted, medium-grained, fossiliferous, chlorite-cemented, feldspathic-lithic (VRF) sandstone. Well-developed microstylolitic fabrics & pervasive replacement by zeolites, & clay minerals. Authigenic hematite concentrated along stylolites. Intercrystalline microporosity – scattered. Effective porosity is lacking.



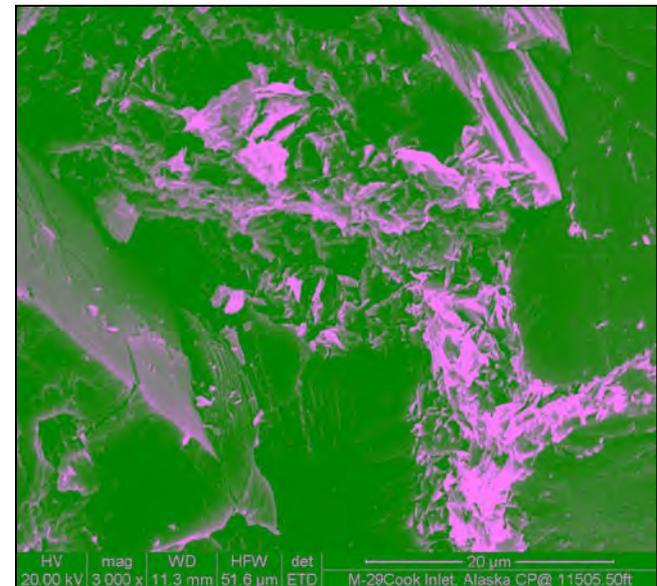
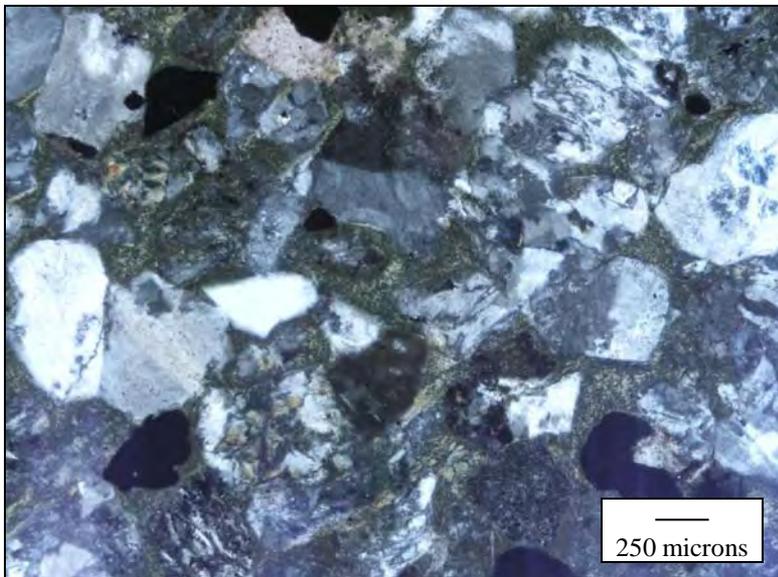
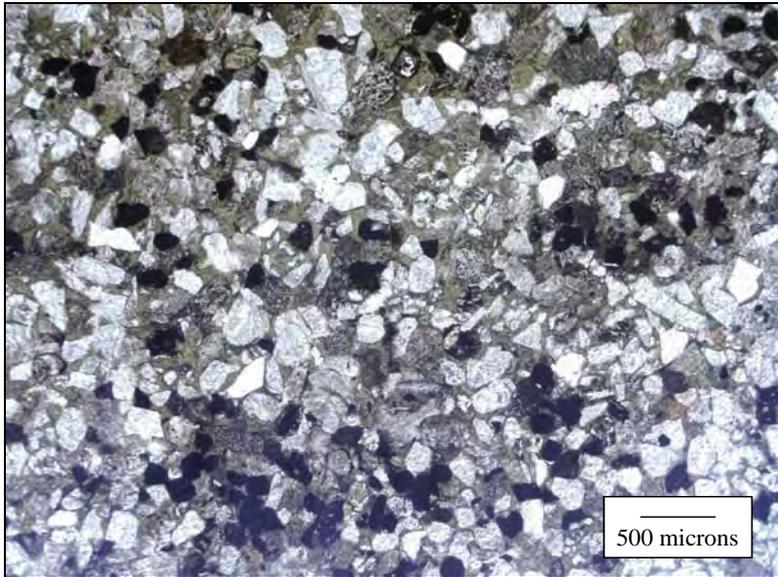
M-29: 11,503.3 ft

Moderately compacted, moderately well sorted, fine-grained, chlorite cemented, feldspathic-lithic (VRF) sandstone with pervasive replacement by zeolites & clay minerals. Microstylolitic fabrics developed locally. Intercrystalline micropores & laumontite cemented microfractures present. No effective porosity.



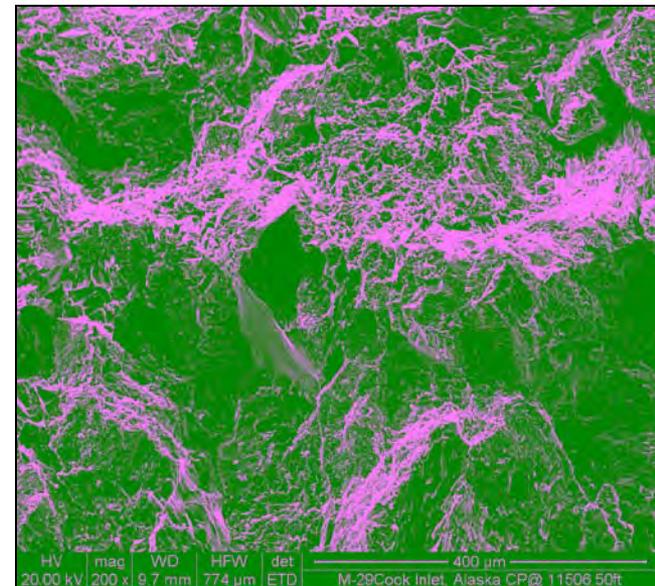
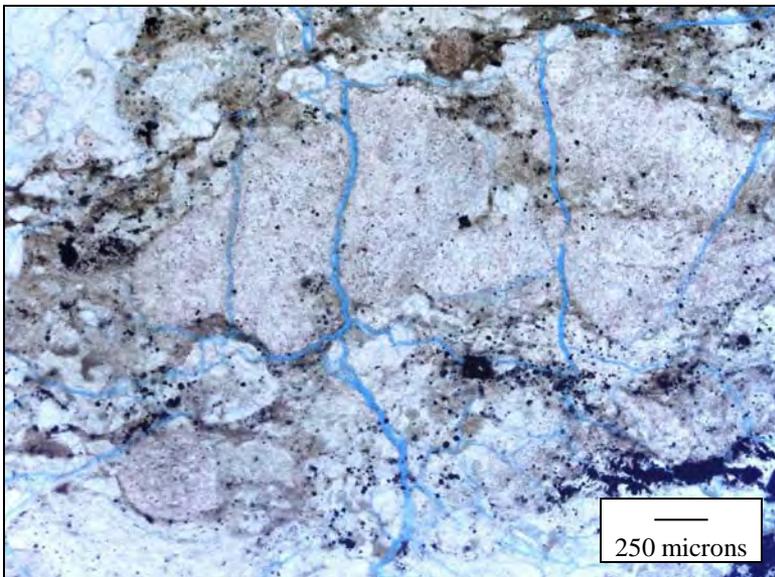
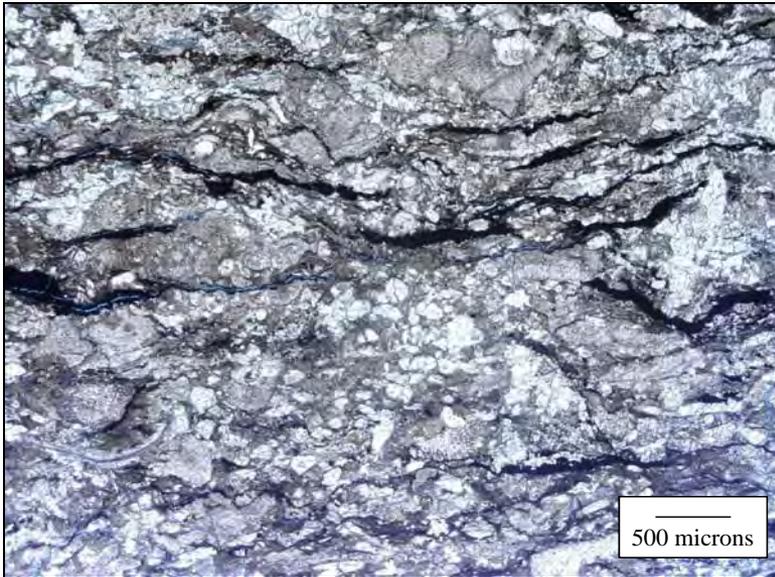
M-29: 11,505.5 ft

Moderately compacted, moderately well sorted, fine-grained, chlorite cemented, feldspathic-lithic (VRF) sandstone with pseudomatrix & pervasive replacement by zeolites & clay minerals. Intercrystalline micropores & laumontite cemented microfractures present. Effective pore network absent.



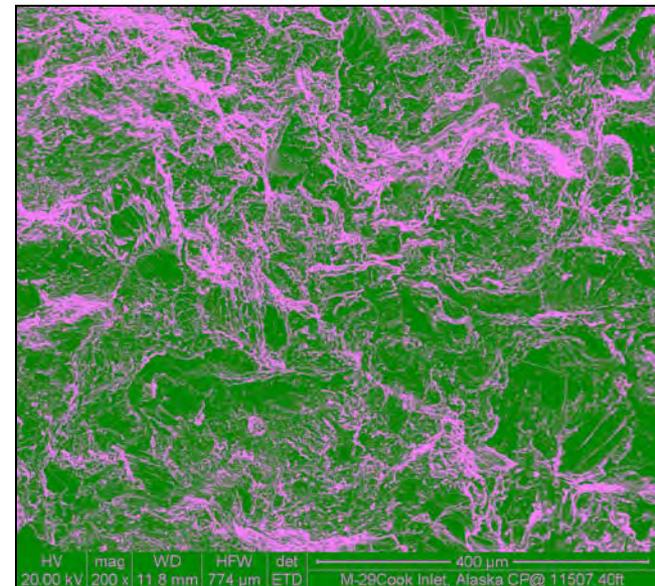
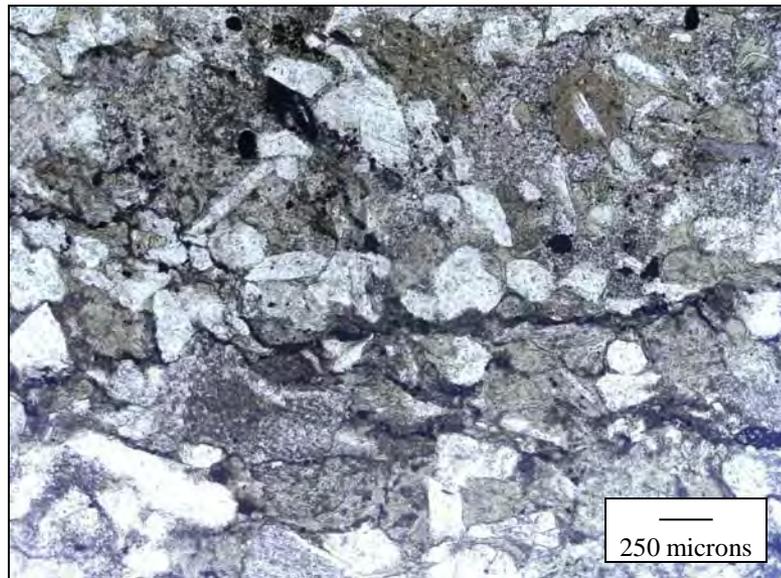
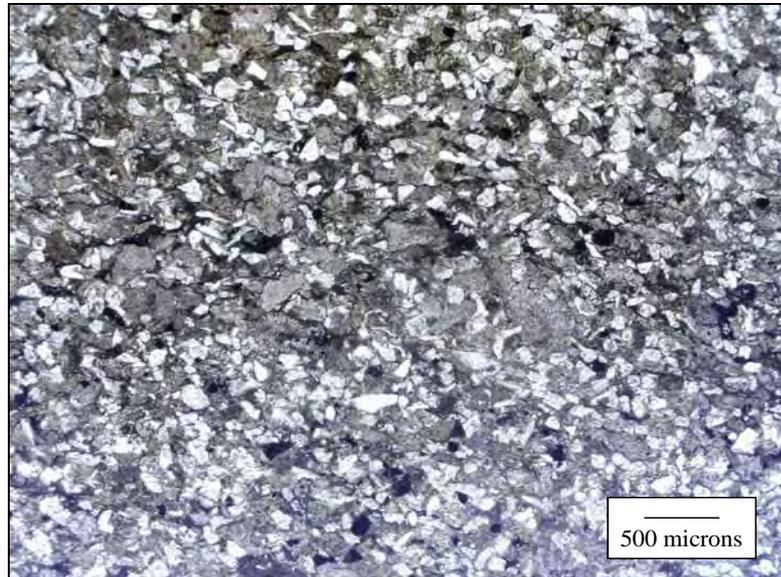
M- 29: 11,506.5 ft

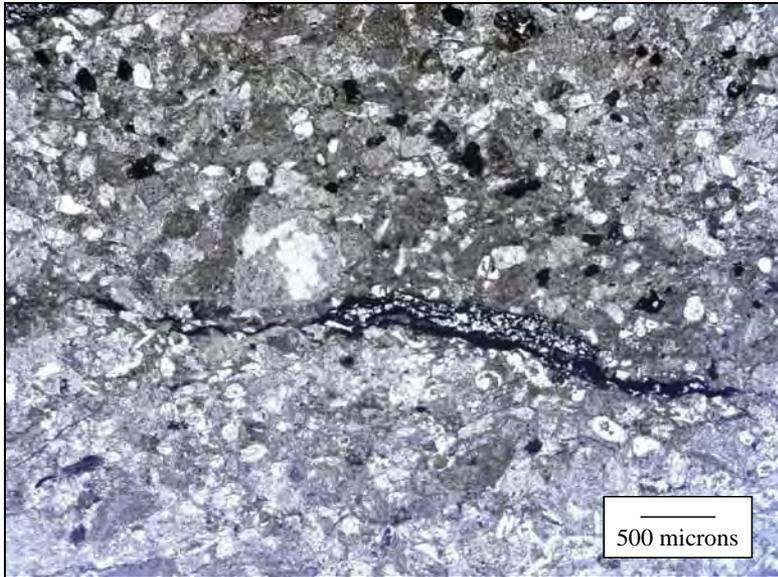
Pervasively microstylolitized, moderately sorted, medium-grained, carbonaceous, fossiliferous, feldspathic sandstone with chlorite cements & replacive zeolites. Intercrystalline microporosity – abundant. Sample transected by open, vertical to oblique microfractures. Effective porosity restricted to fracture network.



M-29: 11,507.4 ft

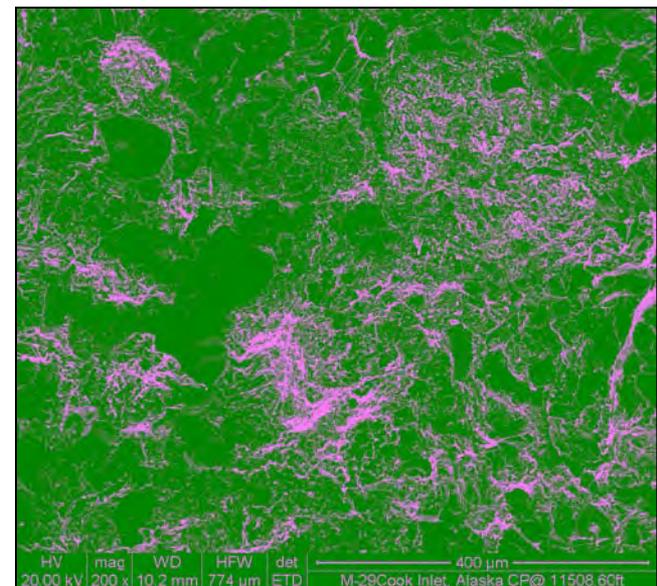
Strongly compacted, well sorted, very fine-grained, carbonaceous, chlorite cemented, lithic-feldspathic-sandstone with pervasive replacement by zeolites, chlorite & clay minerals. Sub-horizontal microstylolites common. Intercrystalline microporosity - abundant. Effective porosity is lacking.





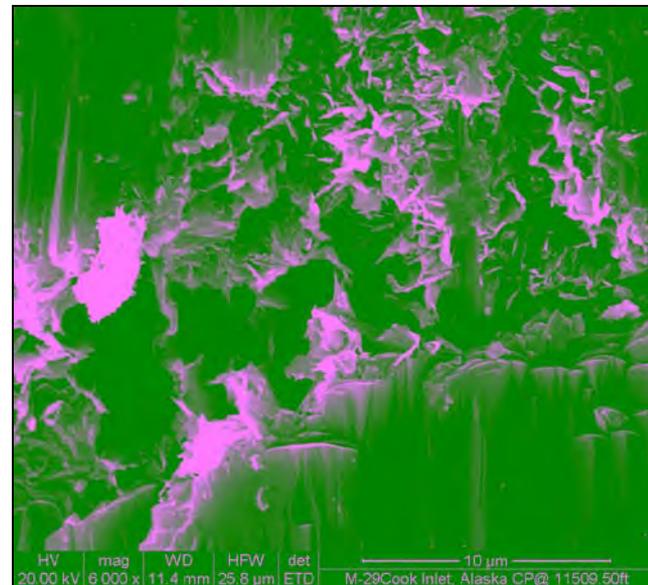
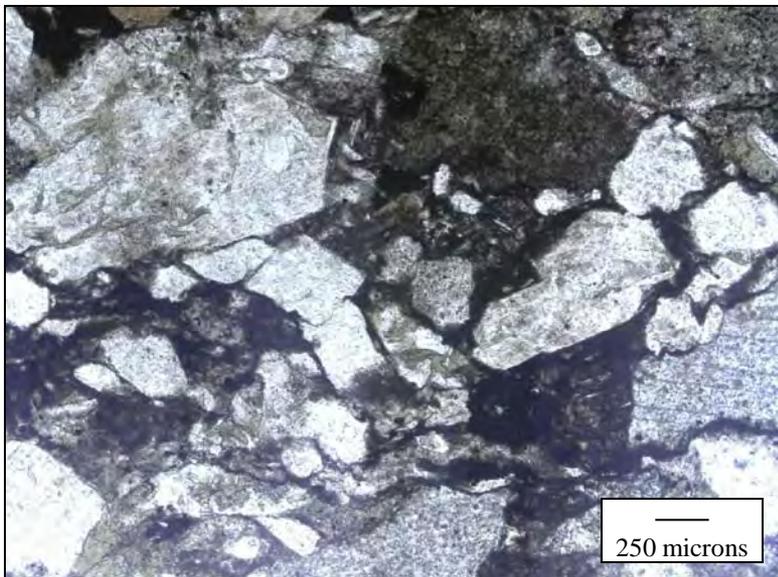
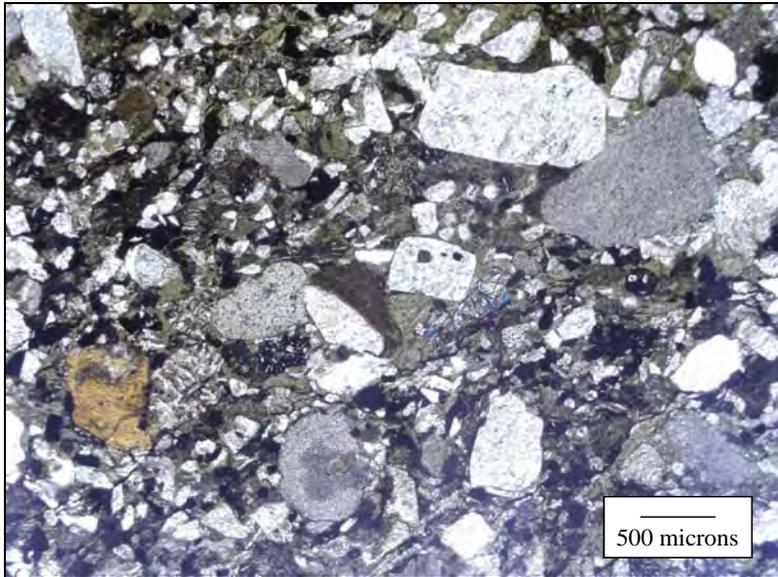
M-29: 11,508.6 ft

Strongly compacted, moderately well sorted, very fine-grained, chlorite cemented, feldspathic-lithic (VRF) sandstone with pervasive replacement by zeolites, chlorite & calcite. Intercrystalline microporosity - common; open & laumontite-cemented, oblique, en-echelon microfractures - present. Effective porosity limited to fractures.



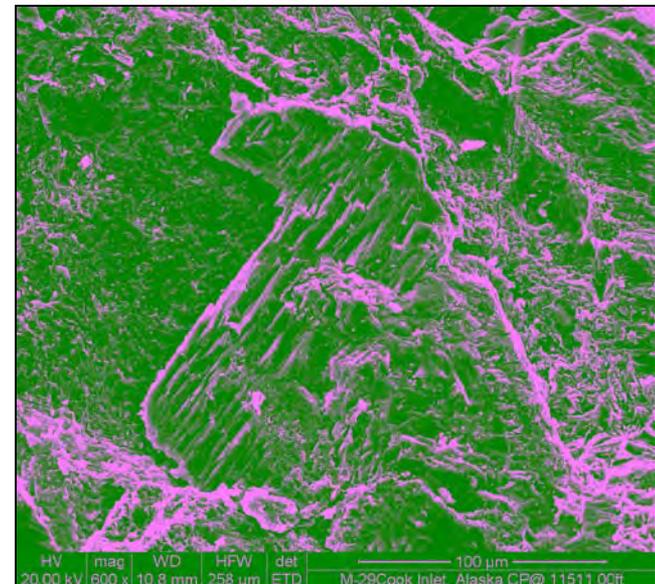
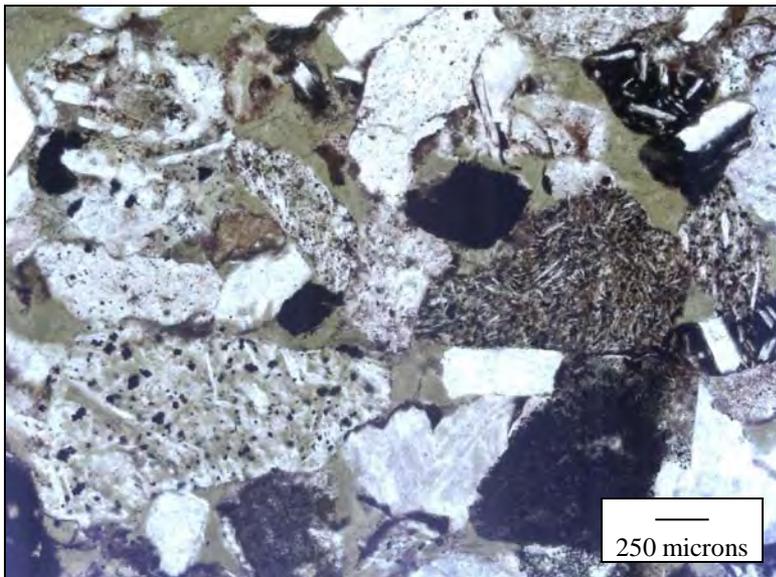
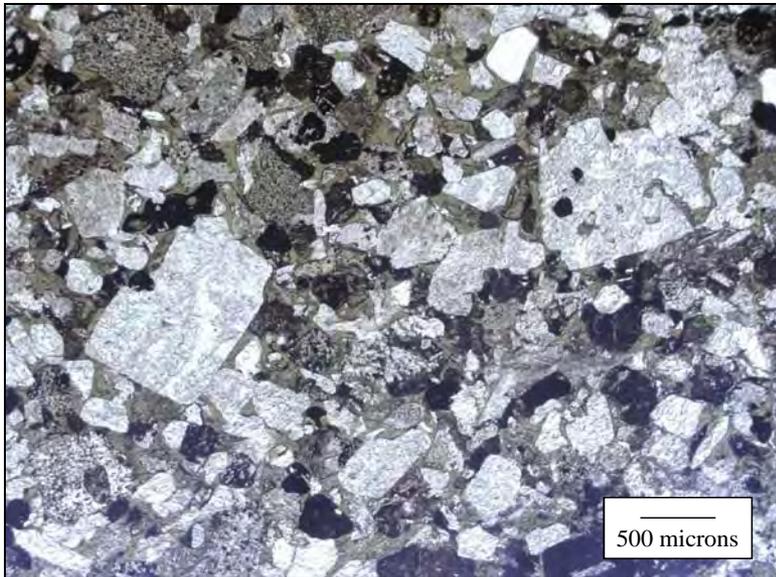
M-29: 11,509.5 ft

Strongly compacted, poorly sorted, fine- to coarse-grained, feldspathic-lithic (VRF) sandstone with abundant chlorite cements, pseudomatrix & replacive zeolites & clay minerals. Microstylolitic fabrics - pervasive. Intercrystalline microporosity - common. Effective porosity is absent.

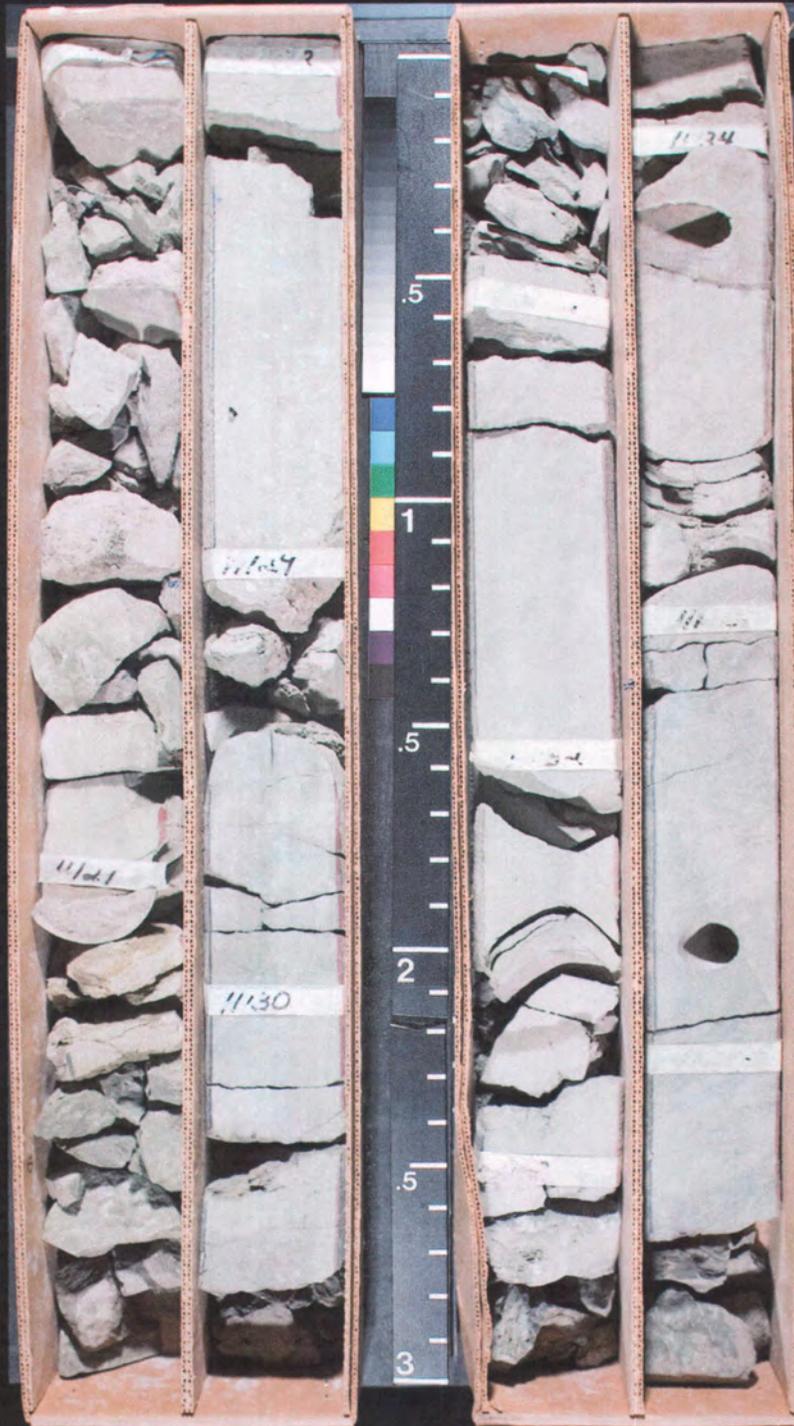


M-29: 11,511.0 ft

Moderately compacted, moderately sorted, medium-grained, chlorite cemented, feldspathic-lithic (VRF) sandstone with pervasive replacement by zeolites & clay minerals. Intercrystalline micropores - abundant & chlorite-cemented microfractures- present. No effective porosity.



11125' 11128' Before 11131' 11134'





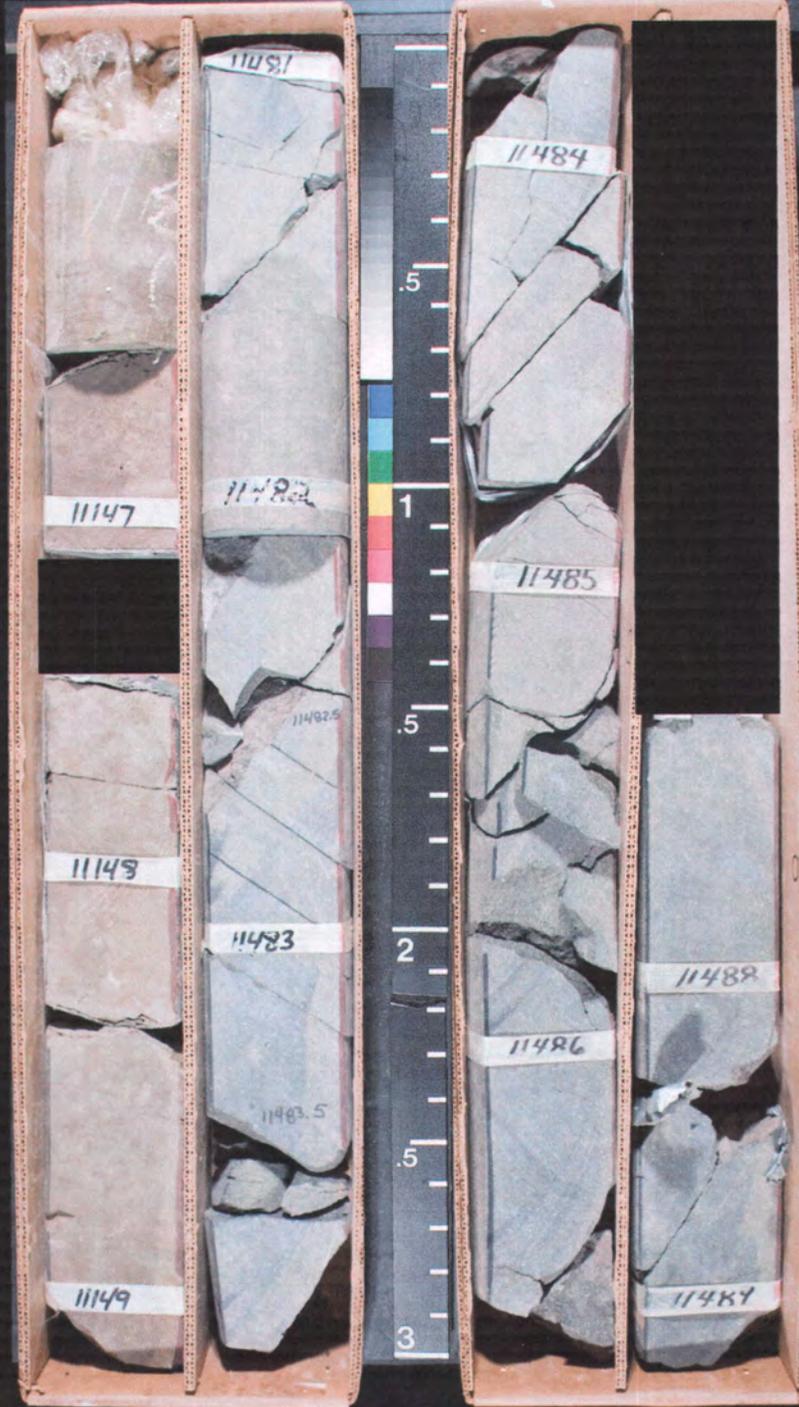
Chevron North America Exploration and Production
Marathon TBU M-29 Well
McArthur River Field
Alaska

AK-40741

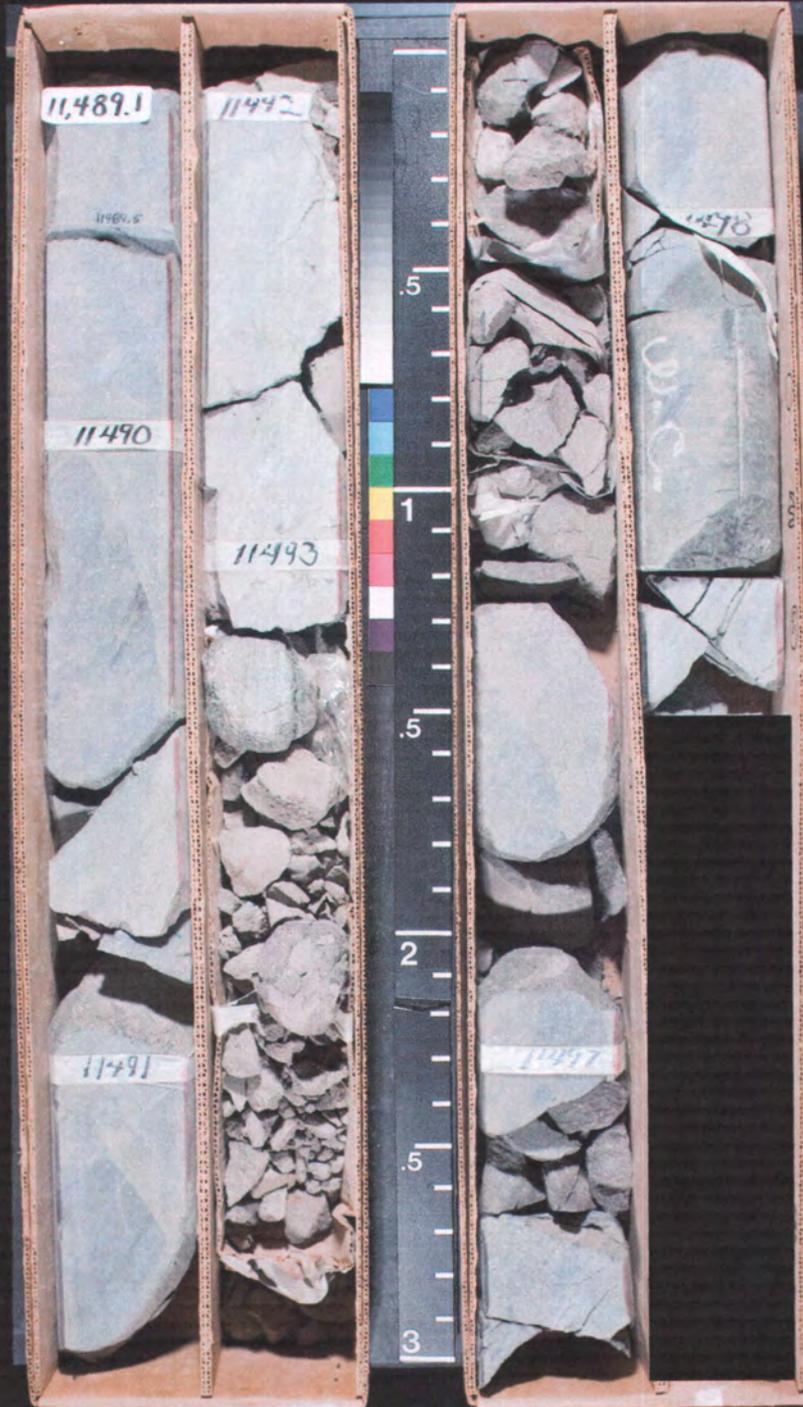
11136.5' 11139.3' Before 11141.6' 11144'



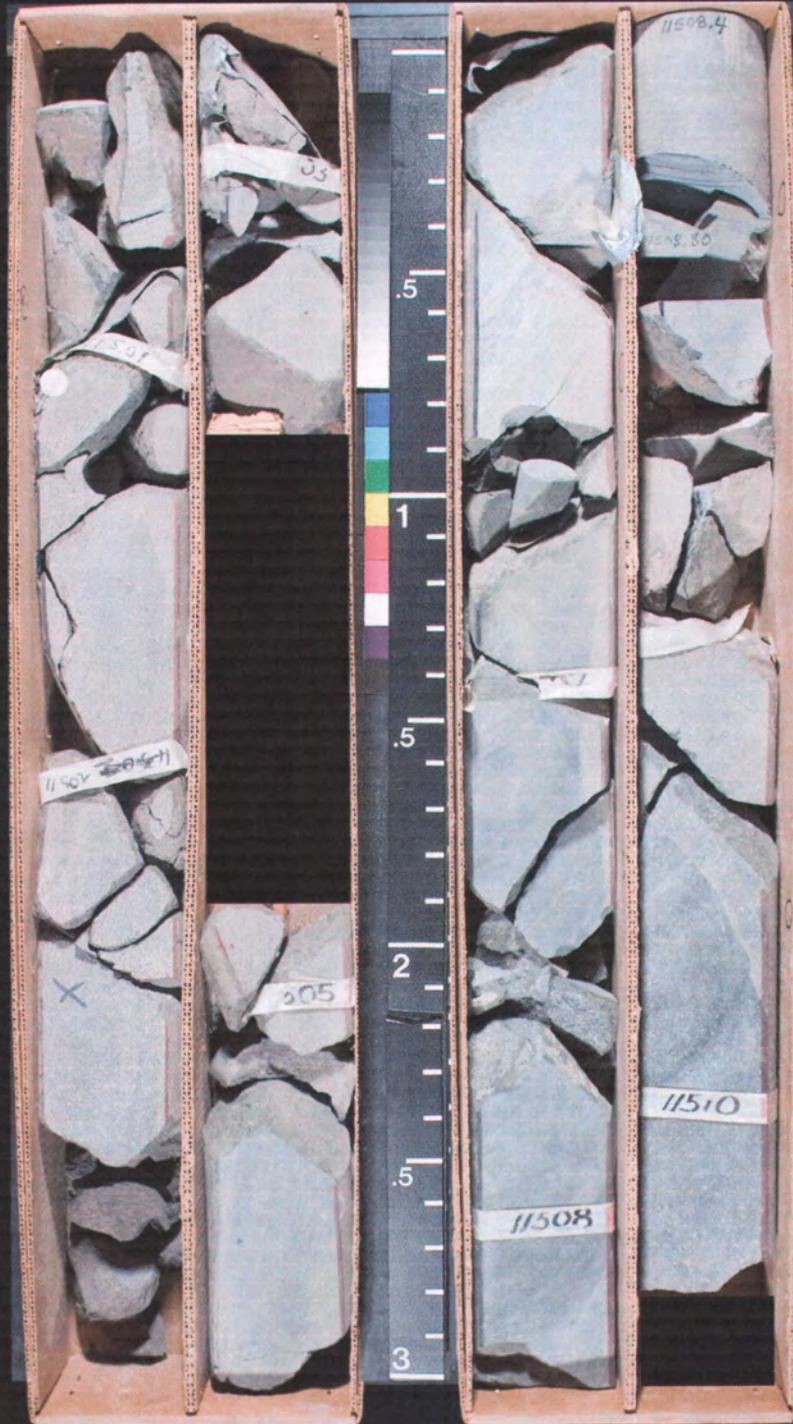
11146' 11481' Before 11483.8' 11486.7'



11489' 11492' Before 11495' 11497.6'



11500.6' 11502.8' Before 11505.7' 11508.4'





Chevron North America Exploration and Production
Marathon TBU M-29 Well
McArthur River Field
Alaska

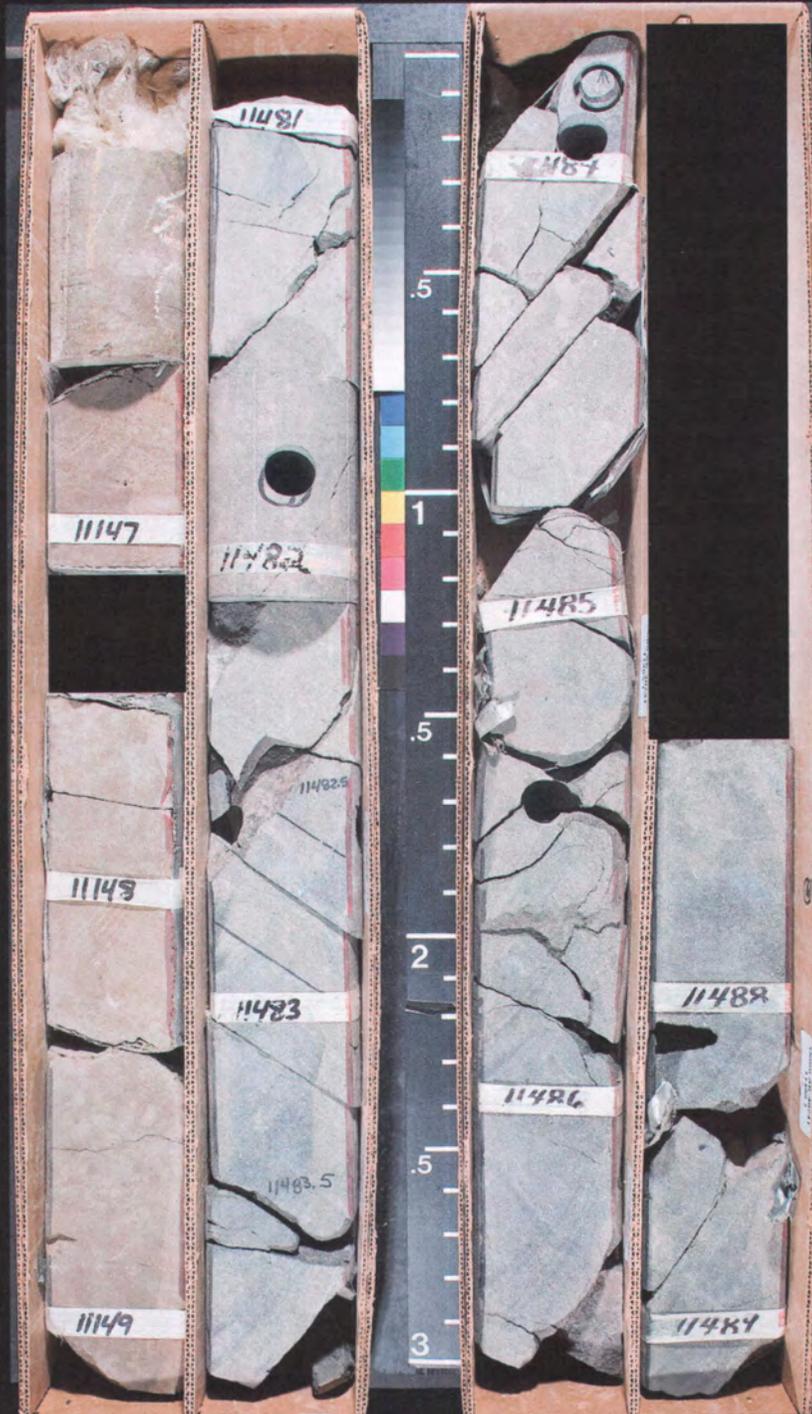
AK-40741

11510.4'

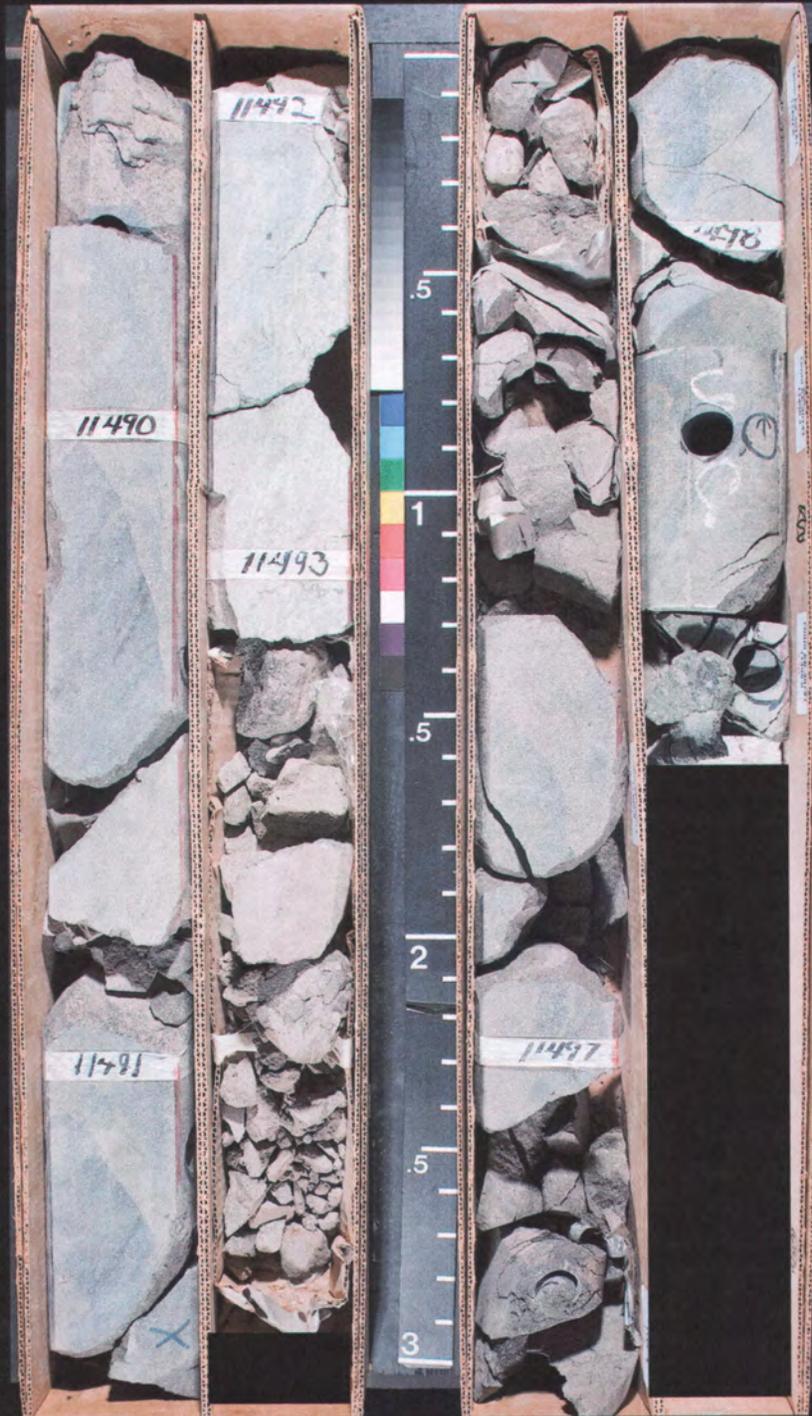
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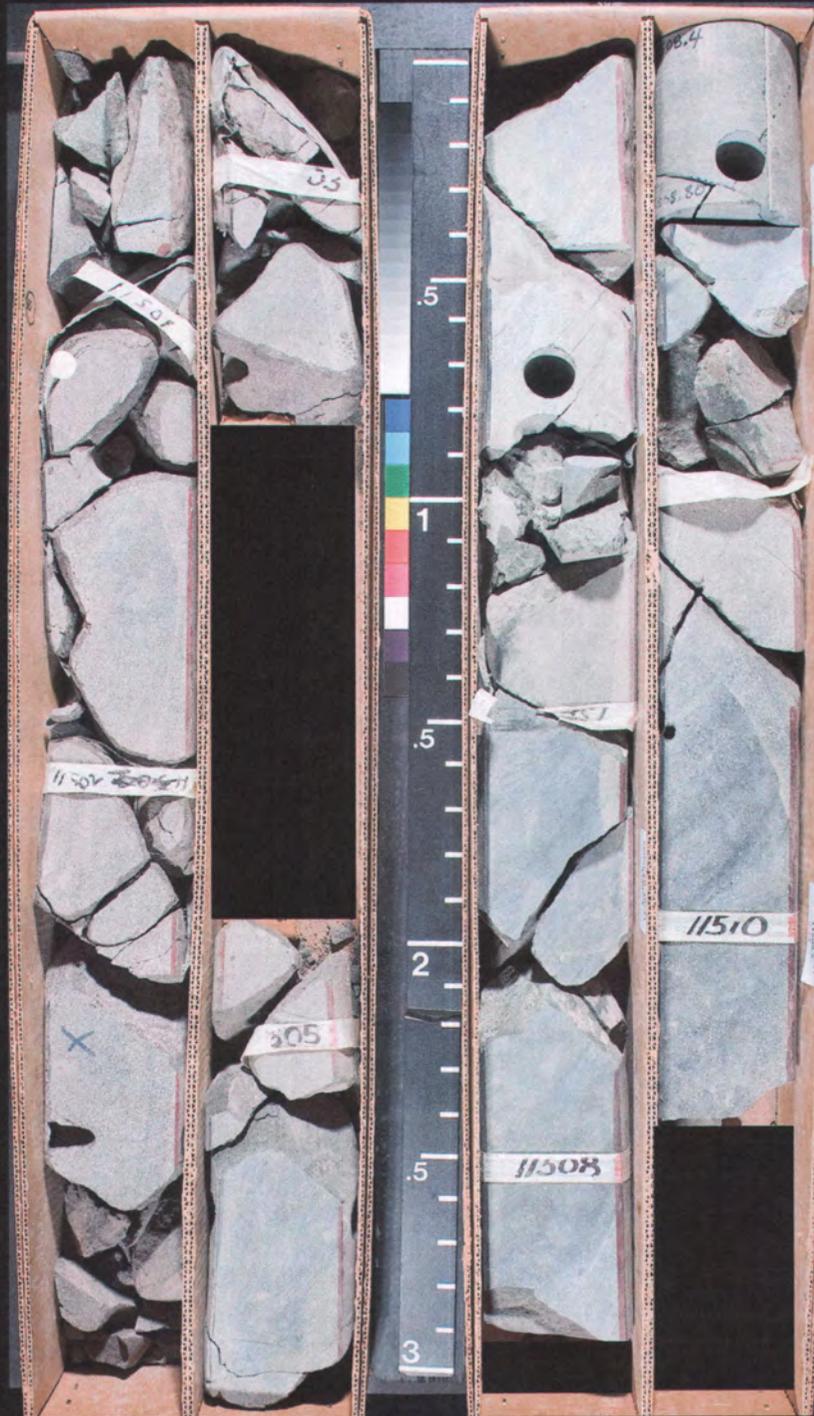
11146' 11481' After 11483.8' 11486.7'



11489' 11492' After 11495' 11497.6'



11500.6' 11502.8' After 11505.7' 11508.4'





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11510.4'

After



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