



# Organic Petrography of the Montney Formation in Alberta: Shale Gas Data Release

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## Abstract

This report is a data release of organic petrography and maturation (Ro) for selected samples of the Montney Formation generated for the Energy Resources Conservation Board/Alberta Geological Survey project on shale gas resources in Alberta. A few samples were also taken from adjoining formations, such as the Nordegg, Belloy and Doig. This data release complements other reports and data from the same project, as listed in Table 1.

# 1 Introduction

The Energy Resources Conservation Board/Alberta Geological Survey (ERCB/AGS) initiated a project in 2007 to evaluate shale gas resources in Alberta (Rokosh et al., 2009a–c), to determine the quantity and spatial extent of these resources. Alberta Geological Survey is releasing a series of reports to disseminate data and knowledge from the project.

The first formations chosen for evaluation were the Colorado Group (Beaton et al, 2009a; Pawlowicz et al., 2009b), and the Banff and Exshaw formations (Beaton et al., 2009b; Pawlowicz et al., 2009a). These publications are available for download on the AGS website (<http://www.ags.gov.ab.ca/publications>). Four reports containing geochemical and geological data on the Montney, Duvernay and Muskwa formations have also been released (Anderson et al., 2010a, b; Beaton et al., 2010a, b).

This report disseminates organic petrography results on samples from principally the Montney Formation (Appendix 3). A few samples were also taken from adjoining formations, such as the Nordegg, Belloy and Doig.

In addition to organic petrography, AGS ran a series of analyses on core samples (Table 1). The data generated from the project will be combined with additional data to map and estimate shale gas resources in the province.

Table 1. Analyses performed on core samples, and the organization that performed the analyses as part of the shale gas resource evaluation project.

Analysis Type	Company/Analyst	References
Adsorption isotherm	Schlumberger/TerraTek	Beaton et al. (2010a, b),
Mercury porosimetry, and helium pycnometry	Department of Physics, University of Alberta (D. Schmitt)	Anderson et al. (2010a, b)
Permeametry	Department of Earth and Atmospheric Sciences, University of Alberta (M. Gingras)	Anderson et al. (2010a, b)
Rock Eval™/TOC	Geological Survey of Canada; Schlumberger/TerraTek	Beaton et al. (2010a, b)
Organic petrography	Geological Survey of Canada (J. Reyes)	This report
Petrographic analysis (thin section)	Vancouver Petrographics, Alberta Geological Survey	Work in progress
Scanning Electron Microscope (SEM) with energy-dispersive X-ray (EDX)	Department of Earth and Atmospheric Sciences, University of Alberta (D-A. Rollings)	Anderson et al. (2010a, b)
X-Ray diffraction (bulk and clay mineral)	SGS Minerals Services Ltd. (H. Zhou)	Anderson et al. (2010a, b)

## 2 Sample Location and Description

Figure 1 displays all core sample sites associated with the Montney and adjoining formations. Table 2 and Appendix 1 list the locations of the sample sites.

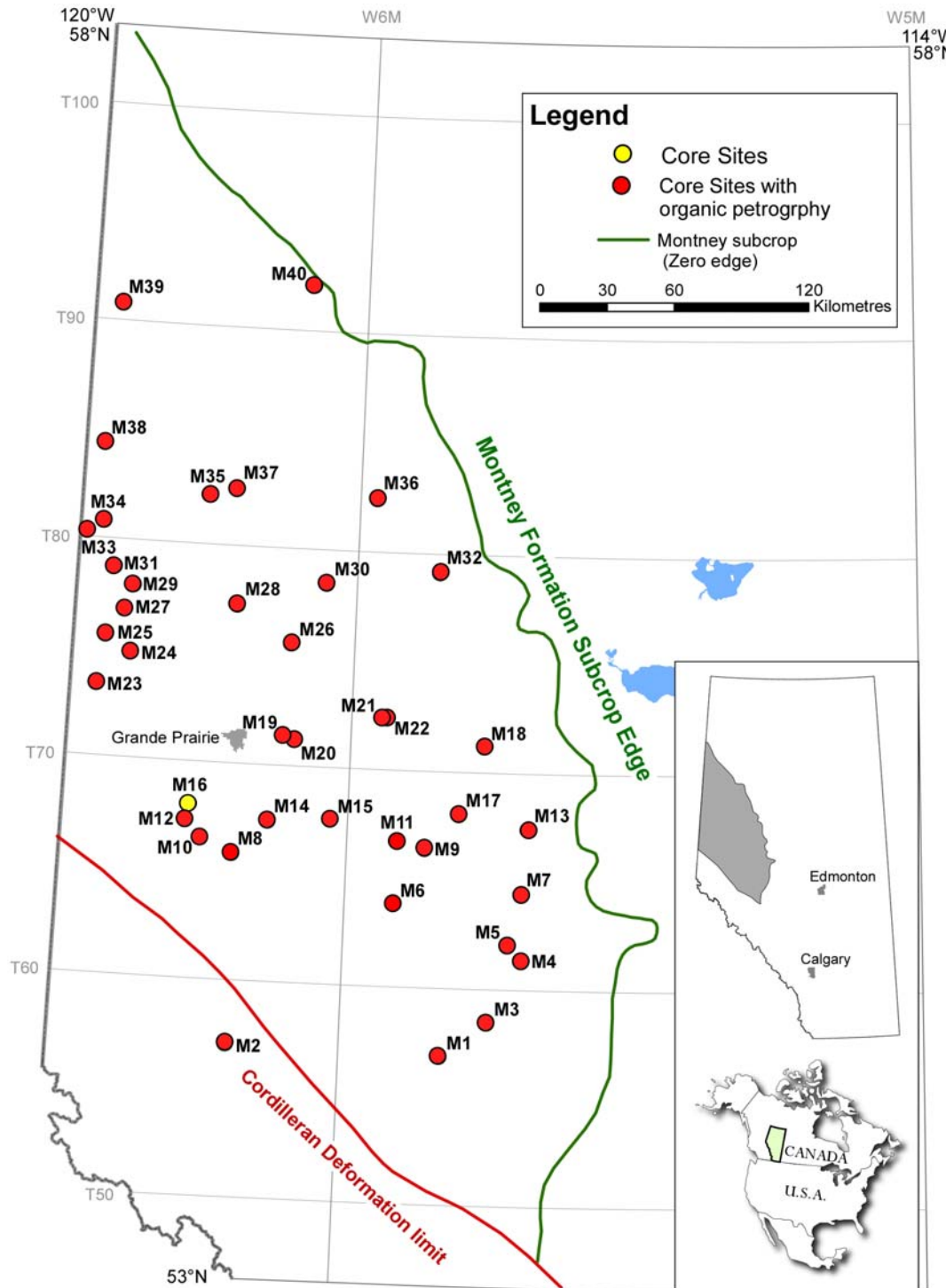


Figure 1. Core sites sampled for organic petrography from the Montney and adjoining formations. See Table 2 and Appendix 1 for a list of all sites, and Appendix 2 for the type of analyses run on the samples.

Table 2. Core sample sites in the Montney and adjoining formations. Figure 1 shows the site numbers.

Site	Location - UWI	Latitude NAD 83	Longitude NAD 83	Year Drilled	Year Sampled	No. of Samples	Project
M1	100/11-14-057-23W5/00	53.928046	-117.314072	1995	2008	6	Montney
M2	100/16-23-057-06W6/00	53.945460	-118.771591	1976	2008	25	Montney
M3	100/04-06-059-20W5/00	54.068135	-116.995887	1997	2008	8	Montney
M4	102/11-34-061-19W5/00	54.320254	-116.767810	1996	2008	7	Montney
M5	100/11-24-062-20W5/00	54.379782	-116.867662	1970	2008	8	Montney
M6	100/07-14-064-25W5/00	54.535464	-117.664978	1984	2008	8	Montney
M7	103/10-34-064-19W5/00	54.584938	-116.780560	1996	2008	7	Montney
M8	100/06-14-066-06W6/00	54.710226	-118.798055	1979	2008	6	Montney
M9	100/16-31-066-23W5/00	54.759431	-117.460327	1980	2008	7	Montney
M10	100/07-05-067-07W6/00	54.768110	-119.025448	1977	2008	7	Montney
M11	100/12-07-067-24W5/00	54.788150	-117.658255	1996	2008	9	Montney
M12	100/14-27-067-08W6/00	54.835461	-119.131850	1998	2008	7	Montney
M13	100/13-31-067-18W5/00	54.847060	-116.741498	1998	2008	5	Montney
M14	100/13-33-067-04W6/00	54.847494	-118.556477	1995	2008	4	Montney
M15	100/13-05-068-01W6/00	54.863502	-118.124671	1992	2008	9	Montney
M16	100/06-23-068-08W6/00	54.898674	-119.111277	1980	2008	5	Montney
M17	100/05-24-068-22W5/00	54.899835	-117.227282	1958	2008	8	Montney
M18	100/02-30-071-20W5/00	55.174071	-117.059408	1996	2008	6	Montney
M19	100/11-28-071-03W6/00	55.178479	-118.397982	1993	2008	15	Montney
M20	100/06-36-071-04W6/00	55.191378	-118.475701	1993	2008	14	Montney
M21	100/06-33-072-25W5/00	55.278609	-117.787914	1997	2008	6	Montney
M22	100/06-34-072-25W5/00	55.279487	-117.763567	1997	2008	6	Montney
M23	100/05-32-073-12W6/00	55.363395	-119.815440	1999	2008	7	Montney
M24	100/01-14-075-11W6/00	55.493733	-119.583341	1995	2008	7	Montney
M25	100/06-03-076-12W6/00	55.554749	-119.772543	1981	2008	6	Montney
M26	100/15-06-076-03W6/00	55.560441	-118.451191	1992	2008	8	Montney
M27	100/14-09-077-11W6/00	55.661617	-119.647542	1982	2008	4	Montney
M28	100/11-27-077-06W6/00	55.704273	-118.845833	2001	2008	4	Montney
M29	100/05-14-078-11W6/00	55.760386	-119.594242	0993	2008	7	Montney
M30	102/11-34-078-02W6/00	55.805873	-118.221355	1997	2008	8	Montney
M31	100/06-12-079-12W6/00	55.831641	-119.737689	1993	2008	7	Montney
M32	102/14-20-079-22W5/00	55.867389	-117.411478	1999	2008	5	Montney
M33	100/12-27-080-13W6/00	55.966743	-119.952010	1997	2008	4	Montney
M34	100/15-08-081-12W6/00	56.011155	-119.835654	1994	2008	6	Montney
M35	100/14-30-082-07W6/00	56.141571	-119.090112	1998	2008	9	Montney
M36	100/11-32-082-25W5/00	56.154459	-117.882771	1996	2008	7	Montney
M37	102/13-04-083-06W6/00	56.171475	-118.895792	1984	2008	2	Montney
M38	100/04-32-084-12W6/00	56.322217	-119.866817	1991	2008	6	Montney
M39	102/01-14-091-12W6/00	56.889041	-119.804180	1999	2008	5	Montney
M40	100/10-21-092-03W6/00	56.998193	-118.411471	1972	2008	8	Montney
Total						293	

### 3 Analytical Methods and Results

A total of 293 core samples was selected for analysis. The analyses were performed on selected samples, as indicated in Appendix 2, by the laboratories listed in Table 1.

#### 3.1 Organic Petrography

Petrographic analysis of organic components (e.g., Taylor et al., 1998) of shale samples was performed to identify organic constituents conducive to hydrocarbon potential, texture and inorganic composition, and thermal maturity of the sample. The Geological Survey of Canada (GSC)–Calgary conducted the analyses ([http://gsc.nrcan.gc.ca/labs/petrology\\_e.php](http://gsc.nrcan.gc.ca/labs/petrology_e.php)). The petrographic descriptions and images in Appendix 3 were edited and documented, including the addition of the AGS sample number and a new scale bar.

Organic petrography is typically performed in both white and ultraviolet reflected light to observe dispersed organic matter and hydrocarbon in a sample. Organic petrography will help identify the type and amount of organic matter present (algae, bitumen, etc.) and is useful in determining hydrocarbon potential and modelling organic facies to assist in source-rock exploration and evaluation. Vitrinite reflectance (and reflectance on bitumen) indicates the thermal maturation of a sample, which is correlated to hydrocarbon-generation history and potential.



## 4 References

- Anderson, S.D.A., Beaton, A.P., Berhane, H., Pawlowicz, J.G. and Rokosh, C.D. (2010a): Mineralogy, permeameter, mercury porosimetry, pycnometry and scanning electron microscope imaging of the Montney Formation in Alberta: shale gas data release; Energy Resources Conservation Board, ERCB/AGS Open File Report 2010-03, 63 p., URL <[http://www.ags.gov.ab.ca/publications/abstracts/OFR\\_2010\\_03.html](http://www.ags.gov.ab.ca/publications/abstracts/OFR_2010_03.html)> [April 16, 2010].
- Anderson, S.D.A., Beaton, A.P., Berhane, H., Pawlowicz, J.G. and Rokosh, C.D. (2010b): Mineralogy, permeameter, mercury porosimetry, pycnometry and scanning electron microscope imaging of the Duvernay and Muskwa Formations in Alberta: shale gas data release; Energy Resources Conservation Board, ERCB/AGS Open File Report 2010-02, 61 p., URL <[http://www.ags.gov.ab.ca/publications/abstracts/OFR\\_2010\\_02.html](http://www.ags.gov.ab.ca/publications/abstracts/OFR_2010_02.html)> [April 16, 2010].
- Beaton, A.P., Pawlowicz, J.G., Anderson, S.D.A. and Rokosh, C.D. (2009a): Rock Eval™, total organic carbon, isotherms and organic petrography of the Colorado Group: shale gas data release; Energy Resources Conservation Board, ERCB/AGS Open File Report 2008-11, 88 p., URL <[http://www.ags.gov.ab.ca/publications/abstracts/OFR\\_2008\\_11.html](http://www.ags.gov.ab.ca/publications/abstracts/OFR_2008_11.html)> [April 16, 2010].
- Beaton, A.P., Pawlowicz, J.G., Anderson, S.D.A. and Rokosh, C.D. (2009b): Rock Eval™, total organic carbon, isotherms and organic petrography of the Banff and Exshaw formations: shale gas data release; Energy Resources Conservation Board, ERCB/AGS Open File Report 2008-12, 65 p., URL <[http://www.ags.gov.ab.ca/publications/abstracts/OFR\\_2008\\_12.html](http://www.ags.gov.ab.ca/publications/abstracts/OFR_2008_12.html)> [April 16, 2010].
- Beaton, A.P., Pawlowicz, J.G., Anderson, S.D.A., Berhane, H. and Rokosh, C.D. (2010a): Rock Eval™, total organic carbon, and adsorption isotherms of the Duvernay and Muskwa Formations in Alberta: shale gas data release; Energy Resources Conservation Board, ERCB/AGS Open File Report 2010-04, 32 p., URL <[http://www.ags.gov.ab.ca/publications/abstracts/OFR\\_2010\\_04.html](http://www.ags.gov.ab.ca/publications/abstracts/OFR_2010_04.html)> [April 16, 2010].
- Beaton, A.P., Pawlowicz, J.G., Anderson, S.D.A., Berhane, H. and Rokosh, C.D. (2010b): Rock Eval™, total organic carbon, and adsorption isotherms of the Montney Formation in Alberta: shale gas data release; Energy Resources Conservation Board, ERCB/AGS Open File Report 2010-05, 30 p., URL <[http://www.ags.gov.ab.ca/publications/abstracts/OFR\\_2010\\_05.html](http://www.ags.gov.ab.ca/publications/abstracts/OFR_2010_05.html)> [April 16, 2010].
- Pawlowicz, J.G., Anderson, S.D.A., Rokosh, C.D. and Beaton, A.P. (2009a): Mineralogy, permeametry, mercury porosimetry and scanning electron microscope imaging of the Banff and Exshaw formations: shale gas data release; Energy Resources Conservation Board, ERCB/AGS Open File Report 2008-13, 59 p., URL <[http://www.ags.gov.ab.ca/publications/abstracts/OFR\\_2008\\_13.html](http://www.ags.gov.ab.ca/publications/abstracts/OFR_2008_13.html)> [April 16, 2010].
- Pawlowicz, J.G., Anderson, S.D.A., Rokosh, C.D. and Beaton, A.P. (2009b): Mineralogy, permeametry, mercury porosimetry and scanning electron microscope imaging of the Colorado Group: shale gas data release; Energy Resources Conservation Board, ERCB/AGS Open File Report 2008-14, 92 p., URL <[http://www.ags.gov.ab.ca/publications/abstracts/OFR\\_2008\\_14.html](http://www.ags.gov.ab.ca/publications/abstracts/OFR_2008_14.html)> [April 16, 2010].
- Rokosh, C.D., Pawlowicz, J.G., Berhane, H., Anderson, S.D.A. and Beaton, A.P. (2009a): What is shale gas? An introduction to shale-gas geology in Alberta; Energy Resources Conservation Board, ERCB/AGS Open File Report 2008-08, 26 p., URL <[http://www.ags.gov.ab.ca/publications/abstracts/OFR\\_2008\\_08.html](http://www.ags.gov.ab.ca/publications/abstracts/OFR_2008_08.html)> [April 16, 2010].
- Rokosh, C.D., Pawlowicz, J.G., Berhane, H., Anderson, S.D.A. and Beaton, A.P. (2009b): Geochemical and sedimentological investigation of the Colorado Group for shale gas potential: initial results; Energy Resources Conservation Board, ERCB/AGS Open File Report 2008-09, 86 p., URL <[http://www.ags.gov.ab.ca/publications/abstracts/OFR\\_2008\\_09.html](http://www.ags.gov.ab.ca/publications/abstracts/OFR_2008_09.html)> [April 16, 2010].

- Rokosh, C.D., Pawlowicz, J.G., Berhane, H., Anderson, S.D.A. and Beaton, A.P. (2009c): Geochemical and sedimentological investigation of the Banff and Exshaw formations for shale gas potential: initial results; Energy Resources Conservation Board, ERCB/AGS Open File Report 2008-10, 46 p., URL <[http://www.ags.gov.ab.ca/publications/abstracts/OFR\\_2008\\_10.html](http://www.ags.gov.ab.ca/publications/abstracts/OFR_2008_10.html)> [April 16, 2010].
- Taylor, G.H., Teichmüller, M., Davis, A., Diessel, C.F.K., Littke, R. and Robert, P. (1998): Organic Petrology; Gerüder Borntraeger, Berlin-Stuttgart, 704 p.

## Appendices

### Appendix 1 – Core Sample Location, Depth and Lithology, Montney and Adjoining Formations

#### Legend

Column Label	Label Description
Sample No.	AGS sample number
Site No.	AGS site location number
Location - UWI	Well location - unique well identifier
Sample Depth (metres)	Depth of core sample in metres (measured from core)
Lithology	Brief lithological description of sample
Formation/Group	Geological formation or group at depth of sample

Sample No.	Site No.	Location - UWI	Sample Depth (Metres)	Lithology	Formation/ Group
8113	M25	100/06-03-076-12W6/00	2606.4	siltstone	Montney
8114	M25	100/06-03-076-12W6/00	2617.0	siltstone	Montney
8115	M25	100/06-03-076-12W6/00	2618.8	siltstone	Montney
8116	M25	100/06-03-076-12W6/00	2622.5	siltstone	Montney
8117	M25	100/06-03-076-12W6/00	2629.1	siltstone	Montney
8118	M25	100/06-03-076-12W6/00	2639.9	siltstone	Montney
8119	M14	100/13-33-067-04W6/00	2358.2	siltstone	Montney
8120	M14	100/13-33-067-04W6/00	2366.2	siltstone	Montney
8121	M14	100/13-33-067-04W6/00	2372.5	siltstone	Montney
8122	M14	100/13-33-067-04W6/00	2379.4	siltstone	Montney
8123	M33	100/12-27-080-13W6/00	1741.1	sandstone	Montney
8124	M33	100/12-27-080-13W6/00	1743.9	silty shale	Montney
8125	M33	100/12-27-080-13W6/00	1751.0	sandstone	Montney
8126	M33	100/12-27-080-13W6/00	1758.0	sandstone	Montney
8131	M37	102/13-04-083-06W6/00	1080.5	mudstone	Nordegg
8132	M37	102/13-04-083-06W6/00	1088.9	siltstone	Doig
8701	M27	100/14-09-077-11W6/00	2271.6	siltstone	Montney
8702	M27	100/14-09-077-11W6/00	2276.0	siltstone	Montney
8703	M27	100/14-09-077-11W6/00	2279.9	shaly siltstone	Montney
8704	M27	100/14-09-077-11W6/00	2281.5	siltstone	Montney
8705	M28	100/11-27-077-06W6/00	1741.2	siltstone	Montney
8706	M28	100/11-27-077-06W6/00	1746.6	silty sandstone	Montney
8707	M28	100/11-27-077-06W6/00	1750.2	siltstone	Montney
8708	M28	100/11-27-077-06W6/00	1751.1	siltstone	Montney
8709	M29	100/05-14-078-11W6/00	2189.9	siltstone	Montney
8710	M29	100/05-14-078-11W6/00	2193.5	siltstone	Montney
8711	M29	100/05-14-078-11W6/00	2200.9	siltstone	Montney
8712	M29	100/05-14-078-11W6/00	2206.2	siltstone	Montney
8713	M29	100/05-14-078-11W6/00	2214.4	siltstone	Montney
8714	M29	100/05-14-078-11W6/00	2220.9	siltstone	Montney
8715	M29	100/05-14-078-11W6/00	2225.5	siltstone	Montney
8716	M20	100/06-36-071-04W6/00	1889.2	siltstone and sandstone	Montney
8717	M20	100/06-36-071-04W6/00	1894.6	siltstone	Montney
8718	M20	100/06-36-071-04W6/00	1899.4	siltstone	Montney
8719	M20	100/06-36-071-04W6/00	1903.6	sandy siltstone	Montney
8720	M20	100/06-36-071-04W6/00	1907.5	siltstone	Montney
8721	M20	100/06-36-071-04W6/00	1911.1	siltstone	Montney
8722	M20	100/06-36-071-04W6/00	1916.6	sandstone	Montney
8723	M20	100/06-36-071-04W6/00	1919.2	siltstone	Montney
8724	M20	100/06-36-071-04W6/00	1922.6	siltstone	Montney
8725	M20	100/06-36-071-04W6/00	1931.2	siltstone and sandstone	Montney
8726	M20	100/06-36-071-04W6/00	1933.1	siltstone and sandstone	Montney
8727	M20	100/06-36-071-04W6/00	1938.7	siltstone and sandstone	Montney
8728	M20	100/06-36-071-04W6/00	1940.1	siltstone	Montney
8729	M20	100/06-36-071-04W6/00	1943.0	siltstone	Montney
8730	M23	100/05-32-073-12W6/00	2815.1	siltstone	Montney
8731	M23	100/05-32-073-12W6/00	2816.4	siltstone	Montney
8732	M23	100/05-32-073-12W6/00	2817.9	siltstone	Montney
8733	M23	100/05-32-073-12W6/00	2819.4	siltstone	Montney
8734	M23	100/05-32-073-12W6/00	2823.3	siltstone	Montney
8735	M23	100/05-32-073-12W6/00	2825.9	siltstone	Montney
8736	M23	100/05-32-073-12W6/00	2832.2	sandstone	Montney
8737	M7	103/10-34-064-19W5/00	1768.5	siltstone and sandstone	Montney
8738	M7	103/10-34-064-19W5/00	1770.7	siltstone and sandstone	Montney
8739	M7	103/10-34-064-19W5/00	1776.2	sandstone	Montney
8740	M7	103/10-34-064-19W5/00	1778.5	muddy siltstone	Montney
8741	M7	103/10-34-064-19W5/00	1778.7	coquina	Montney
8742	M7	103/10-34-064-19W5/00	1781.2	muddy siltstone and sandstone	Montney
8743	M7	103/10-34-064-19W5/00	1785.9	sandy siltstone	Montney
8744	M4	102/11-34-061-19W5/00	2163.5	sandy siltstone	Montney
8745	M4	102/11-34-061-19W5/00	2166.3	sandy siltstone	Montney
8746	M4	102/11-34-061-19W5/00	2169.7	silty sandstone	Montney

Sample No.	Site No.	Location - UWI	Sample Depth (Metres)	Lithology	Formation/ Group
8747	M4	102/11-34-061-19W5/00	2171.4	sandy siltstone	Montney
8748	M4	102/11-34-061-19W5/00	2172.0	coquina	Montney
8749	M4	102/11-34-061-19W5/00	2176.6	siltstone	Montney
8750	M4	102/11-34-061-19W5/00	2180.4	sandstone	Montney
8751	M10	100/07-05-067-07W6/00	3076.3	sandy siltstone	Montney
8752	M10	100/07-05-067-07W6/00	3078.8	sandy siltstone	Montney
8753	M10	100/07-05-067-07W6/00	3080.3	siltstone	Montney
8754	M10	100/07-05-067-07W6/00	3081.4	siltstone	Montney
8755	M10	100/07-05-067-07W6/00	3084.5	siltstone	Montney
8756	M10	100/07-05-067-07W6/00	3088.4	sandy siltstone	Montney
8757	M10	100/07-05-067-07W6/00	3093.7	sandy siltstone	Montney
8758	M19	100/11-28-071-03W6/00	1820.5	siltstone and sandstone	Montney
8759	M19	100/11-28-071-03W6/00	1823.6	siltstone and sandstone	Montney
8760	M19	100/11-28-071-03W6/00	1826.4	siltstone	Montney
8761	M19	100/11-28-071-03W6/00	1829.9	siltstone and sandstone	Montney
8762	M19	100/11-28-071-03W6/00	1836.1	siltstone and sandstone	Montney
8763	M19	100/11-28-071-03W6/00	1839.1	sandy siltstone	Montney
8764	M19	100/11-28-071-03W6/00	1840.7	silty sandstone	Montney
8765	M19	100/11-28-071-03W6/00	1845.8	siltstone	Montney
8766	M19	100/11-28-071-03W6/00	1849.6	sandstone	Montney
8767	M19	100/11-28-071-03W6/00	1852.1	sandy siltstone	Montney
8768	M19	100/11-28-071-03W6/00	1857.6	siltstone and sandstone	Montney
8769	M19	100/11-28-071-03W6/00	1858.3	siltstone	Montney
8770	M19	100/11-28-071-03W6/00	1862.8	siltstone	Montney
8771	M19	100/11-28-071-03W6/00	1864.9	sandstone	Montney
8772	M19	100/11-28-071-03W6/00	1869.8	sandy siltstone	Montney
8773	M40	100/10-21-092-03W6/00	778.5	muddy siltstone	Montney
8774	M40	100/10-21-092-03W6/00	781.1	muddy siltstone	Montney
8775	M40	100/10-21-092-03W6/00	783.3	siltstone	Montney
8776	M40	100/10-21-092-03W6/00	784.6	sandy siltstone	Montney
8777	M40	100/10-21-092-03W6/00	787.3	siltstone	Montney
8778	M40	100/10-21-092-03W6/00	791.6	muddy siltstone with sandstone	Montney
8779	M40	100/10-21-092-03W6/00	795.7	mudstone	Montney
8780	M40	100/10-21-092-03W6/00	798.3	sandstone	Montney
8781	M15	100/13-05-068-01W6/00	2044.4	siltstone	Montney
8782	M15	100/13-05-068-01W6/00	2047.7	coquina	Montney
8783	M15	100/13-05-068-01W6/00	2048.8	sandstone	Montney
8784	M15	100/13-05-068-01W6/00	2055.4	silty sandstone	Montney
8785	M15	100/13-05-068-01W6/00	2057.4	siltstone	Montney
8786	M15	100/13-05-068-01W6/00	2235.3	sandy siltstone	Montney
8787	M15	100/13-05-068-01W6/00	2238.5	siltstone	Montney
8788	M15	100/13-05-068-01W6/00	2240.9	siltstone	Montney
8789	M15	100/13-05-068-01W6/00	2245.8	grainstone	Belloy
8790	M13	100/13-31-067-18W5/00	1628.1	shale	Nordeg
8791	M13	100/13-31-067-18W5/00	1658.7	sandy mudstone and siltstone	Montney
8792	M13	100/13-31-067-18W5/00	1662.1	sandy siltstone	Montney
8793	M13	100/13-31-067-18W5/00	1665.9	sandy siltstone	Montney
8794	M13	100/13-31-067-18W5/00	1672.9	silty sandstone	Montney
8795	M32	102/14-20-079-22W5/00	864.7	sandy siltstone	Montney
8796	M32	102/14-20-079-22W5/00	866.6	siltstone and sandstone	Montney
8797	M32	102/14-20-079-22W5/00	872.0	silty sandstone	Montney
8798	M32	102/14-20-079-22W5/00	876.7	siltstone and sandstone	Montney
8799	M32	102/14-20-079-22W5/00	879.2	sandy siltstone	Montney
8800	M5	100/11-24-062-20W5/00	2080.9	shale	Nordeg
8801	M5	100/11-24-062-20W5/00	2087.6	coquina	Montney
8802	M5	100/11-24-062-20W5/00	2090.3	coquina	Montney
8803	M5	100/11-24-062-20W5/00	2094.9	coquina	Montney
8804	M5	100/11-24-062-20W5/00	2097.3	sandy siltstone	Montney
8805	M5	100/11-24-062-20W5/00	2102.2	sandy siltstone	Montney
8806	M5	100/11-24-062-20W5/00	2105.1	sandy siltstone	Montney
8807	M5	100/11-24-062-20W5/00	2107.8	sandy siltstone	Montney
8808	M3	100/04-06-059-20W5/00	2643.9	shale	Nordeg

Sample No.	Site No.	Location - UWI	Sample Depth (Metres)	Lithology	Formation/ Group
8809	M3	100/04-06-059-20W5/00	2644.3	shale	Nordegg
8810	M3	100/04-06-059-20W5/00	2645.9	sandstone	Montney
8811	M3	100/04-06-059-20W5/00	2648.2	silty sandstone	Montney
8812	M3	100/04-06-059-20W5/00	2651.1	sandy siltstone	Montney
8813	M3	100/04-06-059-20W5/00	2656.4	sandy siltstone	Montney
8814	M3	100/04-06-059-20W5/00	2658.8	sandy siltstone	Montney
8815	M3	100/04-06-059-20W5/00	2660.9	sandy siltstone	Montney
8816	M1	100/11-14-057-23W5/00	3007.1	siltstone	Montney
8817	M1	100/11-14-057-23W5/00	3008.7	sandy siltstone	Montney
8818	M1	100/11-14-057-23W5/00	3010.8	siltstone	Montney
8819	M1	100/11-14-057-23W5/00	3013.3	siltstone	Montney
8820	M1	100/11-14-057-23W5/00	3013.9	coquina	Montney
8821	M1	100/11-14-057-23W5/00	3019.4	sandstone	Montney
8822	M21	100/06-33-072-25W5/00	1590.1	siltstone	Montney
8823	M21	100/06-33-072-25W5/00	1592.2	siltstone	Montney
8824	M21	100/06-33-072-25W5/00	1595.5	sandy siltstone	Montney
8825	M21	100/06-33-072-25W5/00	1597.5	sandy siltstone	Montney
8826	M21	100/06-33-072-25W5/00	1602.0	siltstone	Montney
8827	M21	100/06-33-072-25W5/00	1607.4	sandy siltstone	Montney
8828	M22	100/06-34-072-25W5/00	1535.4	shale	Nordegg
8829	M22	100/06-34-072-25W5/00	1536.1	shale	Nordegg
8830	M22	100/06-34-072-25W5/00	1538.3	siltstone	Montney
8831	M22	100/06-34-072-25W5/00	1542.5	sandy siltstone	Montney
8832	M22	100/06-34-072-25W5/00	1545.4	siltstone	Montney
8833	M22	100/06-34-072-25W5/00	1550.0	sandy siltstone	Montney
8834	M2	100/16-23-057-06W6/00	2479.9	silty shale	Doig
8835	M2	100/16-23-057-06W6/00	2480.8	siltstone	Doig
8836	M2	100/16-23-057-06W6/00	2481.1	shaly siltstone	Doig
8837	M2	100/16-23-057-06W6/00	2482.4	lag	Doig
8838	M2	100/16-23-057-06W6/00	2485.3	siltstone	Montney
8839	M2	100/16-23-057-06W6/00	2487.2	siltstone	Montney
8840	M2	100/16-23-057-06W6/00	2489.3	siltstone	Montney
8841	M2	100/16-23-057-06W6/00	2491.1	siltstone	Montney
8842	M2	100/16-23-057-06W6/00	2515.2	siltstone	Montney
8843	M2	100/16-23-057-06W6/00	2516.4	siltstone	Montney
8844	M2	100/16-23-057-06W6/00	2519.2	siltstone	Montney
8845	M2	100/16-23-057-06W6/00	2521.0	silty sandstone	Montney
8846	M2	100/16-23-057-06W6/00	2522.8	siltstone	Montney
8847	M2	100/16-23-057-06W6/00	2646.6	siltstone	Montney
8848	M2	100/16-23-057-06W6/00	2649.0	siltstone	Montney
8849	M2	100/16-23-057-06W6/00	2650.2	siltstone	Montney
8850	M2	100/16-23-057-06W6/00	2652.1	siltstone	Montney
8851	M2	100/16-23-057-06W6/00	2687.4	siltstone	Montney
8852	M2	100/16-23-057-06W6/00	2688.0	sandstone	Montney
8853	M2	100/16-23-057-06W6/00	2689.6	siltstone	Montney
8854	M2	100/16-23-057-06W6/00	2691.7	siltstone	Montney
8855	M2	100/16-23-057-06W6/00	2694.4	sandy siltstone	Montney
8856	M2	100/16-23-057-06W6/00	2696.3	sandy siltstone	Montney
8857	M2	100/16-23-057-06W6/00	2699.9	sandy siltstone	Montney
8858	M2	100/16-23-057-06W6/00	2703.6	siltstone	Montney
8859	M30	102/11-34-078-02W6/00	1770.3	shaly siltstone	Montney
8860	M30	102/11-34-078-02W6/00	1774.8	siltstone	Montney
8861	M30	102/11-34-078-02W6/00	1778.0	sandy siltstone	Montney
8862	M30	102/11-34-078-02W6/00	1779.9	sandy siltstone	Montney
8863	M30	102/11-34-078-02W6/00	1780.7	silty sandstone	Montney
8864	M30	102/11-34-078-02W6/00	1782.2	sandy siltstone	Montney
8865	M30	102/11-34-078-02W6/00	1785.3	siltstone and sandstone	Montney
8866	M30	102/11-34-078-02W6/00	1787.3	sandy siltstone	Montney
8867	M26	100/15-06-076-03W6/00	1444.9	sandy siltstone	Doig
8868	M26	100/15-06-076-03W6/00	1446.0	siltstone	Doig
8869	M26	100/15-06-076-03W6/00	1449.6	siltstone	Doig
8870	M26	100/15-06-076-03W6/00	1452.0	siltstone	Doig

Sample No.	Site No.	Location - UWI	Sample Depth (Metres)	Lithology	Formation/ Group
8871	M26	100/15-06-076-03W6/00	1453.7	siltstone	Doig
8872	M26	100/15-06-076-03W6/00	1457.6	siltstone	Montney
8873	M26	100/15-06-076-03W6/00	1458.6	sandy siltstone	Montney
8874	M26	100/15-06-076-03W6/00	1458.9	siltstone	Montney
8875	M9	100/16-31-066-23W5/00	1708.6	sandy siltstone	Montney
8876	M9	100/16-31-066-23W5/00	1711.5	sandy siltstone	Montney
8877	M9	100/16-31-066-23W5/00	1713.7	silty sandstone	Montney
8878	M9	100/16-31-066-23W5/00	1718.1	siltstone	Montney
8879	M9	100/16-31-066-23W5/00	1720.0	sandy siltstone	Montney
8880	M9	100/16-31-066-23W5/00	1721.9	siltstone	Montney
8881	M9	100/16-31-066-23W5/00	1725.5	siltstone	Montney
8882	M11	100/12-07-067-24W5/00	1904.4	shale or calcilutite	Nordeg
8883	M11	100/12-07-067-24W5/00	1905.9	shale	Nordeg
8884	M11	100/12-07-067-24W5/00	1908.3	shale	Nordeg
8885	M11	100/12-07-067-24W5/00	1908.8	sandy siltstone	Montney
8886	M11	100/12-07-067-24W5/00	1910.1	siltstone	Montney
8887	M11	100/12-07-067-24W5/00	1914.4	sandy siltstone	Montney
8888	M11	100/12-07-067-24W5/00	1917.6	siltstone	Montney
8889	M11	100/12-07-067-24W5/00	1920.5	sandy siltstone	Montney
8890	M11	100/12-07-067-24W5/00	1922.6	siltstone	Montney
8891	M6	100/07-14-064-25W5/00	2289.0	shale or calcilutite.	Nordeg
8892	M6	100/07-14-064-25W5/00	2289.6	shale	Nordeg
8893	M6	100/07-14-064-25W5/00	2291.5	sandy siltstone	Montney
8894	M6	100/07-14-064-25W5/00	2295.2	sandy siltstone	Montney
8895	M6	100/07-14-064-25W5/00	2297.3	siltstone	Montney
8896	M6	100/07-14-064-25W5/00	2300.2	siltstone	Montney
8897	M6	100/07-14-064-25W5/00	2304.0	shaly siltstone	Montney
8898	M6	100/07-14-064-25W5/00	2306.9	shaly siltstone	Montney
8899	M8	100/06-14-066-06W6/00	3026.4	siltstone	Montney
8900	M8	100/06-14-066-06W6/00	3030.6	siltstone	Montney
8901	M8	100/06-14-066-06W6/00	3034.3	siltstone	Montney
8902	M8	100/06-14-066-06W6/00	3037.8	siltstone	Montney
8903	M8	100/06-14-066-06W6/00	3040.6	siltstone	Montney
8904	M8	100/06-14-066-06W6/00	3044.1	siltstone	Montney
8905	M39	102/01-14-091-12W6/00	1110.8	shaly siltstone	Montney
8906	M39	102/01-14-091-12W6/00	1111.9	silty sandstone	Montney
8907	M39	102/01-14-091-12W6/00	1113.4	silty sandstone	Montney
8908	M39	102/01-14-091-12W6/00	1116.9	silty sandstone	Montney
8909	M39	102/01-14-091-12W6/00	1118.2	sandy siltstone	Montney
8910	M38	100/04-32-084-12W6/00	1581.3	siltstone	Montney
8911	M38	100/04-32-084-12W6/00	1582.3	sandy siltstone	Montney
8912	M38	100/04-32-084-12W6/00	1584.1	siltstone	Montney
8913	M38	100/04-32-084-12W6/00	1586.0	silty sandstone	Montney
8914	M38	100/04-32-084-12W6/00	1587.0	sandy siltstone	Montney
8915	M38	100/04-32-084-12W6/00	1592.5	siltstone	Montney
8916	M35	100/14-30-082-07W6/00	1231.2	siltstone	Montney
8917	M35	100/14-30-082-07W6/00	1233.9	siltstone	Montney
8918	M35	100/14-30-082-07W6/00	1235.6	siltstone	Montney
8919	M35	100/14-30-082-07W6/00	1238.7	sandy siltstone	Montney
8920	M35	100/14-30-082-07W6/00	1240.6	siltstone	Montney
8921	M35	100/14-30-082-07W6/00	1241.6	silty sandstone	Montney
8922	M35	100/14-30-082-07W6/00	1243.9	siltstone	Montney
8923	M35	100/14-30-082-07W6/00	1245.7	siltstone	Montney
8924	M35	100/14-30-082-07W6/00	1248.3	sandy siltstone	Montney
8925	M34	100/15-08-081-12W6/00	1824.9	siltstone	Montney
8926	M34	100/15-08-081-12W6/00	1827.7	siltstone	Montney
8927	M34	100/15-08-081-12W6/00	1830.1	siltstone	Montney
8928	M34	100/15-08-081-12W6/00	1833.1	siltstone	Montney
8929	M34	100/15-08-081-12W6/00	1836.0	siltstone	Montney
8930	M34	100/15-08-081-12W6/00	1839.1	siltstone	Montney
8931	M36	100/11-32-082-25W5/00	924.8	shale	Nordeg
8932	M36	100/11-32-082-25W5/00	926.4	shale	Nordeg

Sample No.	Site No.	Location - UWI	Sample Depth (Metres)	Lithology	Formation/ Group
8933	M36	100/11-32-082-25W5/00	927.4	sandy siltstone	Montney
8934	M36	100/11-32-082-25W5/00	929.0	sandy siltstone	Montney
8935	M36	100/11-32-082-25W5/00	933.9	siltstone	Montney
8936	M36	100/11-32-082-25W5/00	936.7	siltstone	Montney
8937	M36	100/11-32-082-25W5/00	940.4	sandstone	Montney
8938	M18	100/02-30-071-20W5/00	1316.1	shale	Nordeg
8939	M18	100/02-30-071-20W5/00	1318.1	shale	Nordeg
8940	M18	100/02-30-071-20W5/00	1319.6	sandstone	Montney
8941	M18	100/02-30-071-20W5/00	1322.2	sandstone	Montney
8942	M18	100/02-30-071-20W5/00	1324.3	sandy siltstone	Montney
8943	M18	100/02-30-071-20W5/00	1327.4	siltstone	Montney
8944	M12	100/14-27-067-08W6/00	3013.6	sandy siltstone	Montney
8945	M12	100/14-27-067-08W6/00	3017.1	silty sandstone	Montney
8946	M12	100/14-27-067-08W6/00	3019.3	silty sandstone	Montney
8947	M12	100/14-27-067-08W6/00	3021.5	siltstone	Montney
8948	M12	100/14-27-067-08W6/00	3026.9	siltstone	Montney
8949	M12	100/14-27-067-08W6/00	3029.7	sandy siltstone	Montney
8950	M12	100/14-27-067-08W6/00	3032.0	sandy siltstone	Montney
8951	M16	100/06-23-068-08W6/00	2972.8	sandstone	Montney
8952	M16	100/06-23-068-08W6/00	2975.0	sandstone	Bello
8953	M16	100/06-23-068-08W6/00	2975.7	conglomerate	Bello
8954	M16	100/06-23-068-08W6/00	2980.7	sandstone	Bello
8955	M16	100/06-23-068-08W6/00	2982.4	sandstone	Bello
8956	M31	100/06-12-079-12W6/00	2013.6	sandy siltstone	Montney
8957	M31	100/06-12-079-12W6/00	2016.1	sandy siltstone	Montney
8958	M31	100/06-12-079-12W6/00	2020.1	sandy siltstone	Montney
8959	M31	100/06-12-079-12W6/00	2024.0	sandy siltstone	Montney
8960	M31	100/06-12-079-12W6/00	2024.7	sandy siltstone	Montney
8961	M31	100/06-12-079-12W6/00	2028.5	sandy siltstone	Montney
8962	M31	100/06-12-079-12W6/00	2030.9	sandy siltstone	Montney
8963	M24	100/01-14-075-11W6/00	2477.5	sandy siltstone	Montney
8964	M24	100/01-14-075-11W6/00	2480.3	siltstone	Montney
8965	M24	100/01-14-075-11W6/00	2483.0	shaly siltstone	Montney
8966	M24	100/01-14-075-11W6/00	2486.5	sandy siltstone	Montney
8967	M24	100/01-14-075-11W6/00	2489.2	siltstone	Montney
8968	M24	100/01-14-075-11W6/00	2491.8	shaly siltstone	Montney
8969	M24	100/01-14-075-11W6/00	2495.1	silty sandstone	Montney
8970	M17	100/05-24-068-22W5/00	1552.9	shale	Nordeg
8971	M17	100/05-24-068-22W5/00	1553.5	shale	Nordeg
8972	M17	100/05-24-068-22W5/00	1556.3	coquina	Montney
8973	M17	100/05-24-068-22W5/00	1559.2	silty sandstone	Montney
8974	M17	100/05-24-068-22W5/00	1560.2	silty sandstone	Montney
8975	M17	100/05-24-068-22W5/00	1562.5	silty sandstone	Montney
8976	M17	100/05-24-068-22W5/00	1564.7	sandy siltstone	Montney
8977	M17	100/05-24-068-22W5/00	1568.3	sandy siltstone	Montney
9247	M15	100/13-05-068-01W6/00	2240.9	duplicate of sample 8788	Montney
9248	M13	100/13-31-067-18W5/00	1662.1	duplicate of sample 8792	Montney
9249	M5	100/11-24-062-20W5/00	2105.1	duplicate of sample 8806	Montney
9250		standard		standard Green River shale USGS (SRG-1b)	standard
9251	M18	100/02-30-071-20W5/00	1324.3	duplicate of sample 8942	Montney
9252	M17	100/05-24-068-22W5/00	1568.3	duplicate of sample 8977	Montney
9253	M31	100/06-12-079-12W6/00	2013.5	duplicate of sample 8956	Montney
9254	M21	100/06-33-072-25W5/00	1590.1 - 1592.2	combined samples 8822 and 8823	Montney
9255	M23	100/05-32-073-12W6/00	2816.4 - 2823.3	combined samples 8731, 8732, 8733, 8734	Montney
9256	M10	100/07-05-067-07W6/00	3088.4 - 3093.7	combined samples 8756, 8757	Montney
9257	M2	100/16-23-057-06W6/00	2646.6 - 2650.2	combined samples 8847, 8848, 8849	Montney
9258	M6	100/07-14-064-25W5/00	2297.3 - 2306.9	combined samples 8895, 8896, 8897, 8898	Montney
9259	M8	100/06-14-066-06W6/00	3030.6 - 3044.1	combined samples 8900, 8901, 8902, 8903, 8904	Montney
9260	M34	100/15-08-081-12W6/00	1827.7 - 1839.1	combined samples 8926, 8927, 8928, 8929, 8930	Montney




## Appendix 2 – Core Samples Analyzed, Montney and Adjoining Formations

### Legend

Y = Sample data presented in this report

x = Sample data presented in other Alberta Geological Survey reports (see Table 1 for details)

z = Data are being analyzed and will be distributed in a future report

 Analyses presented in this report

Column Label	Label Description
Sample No.	AGS sample number
Site No.	Site location number
Rock Eval™ TOC	Rock Eval™ pyrolysis is used to identify the type and maturity of organic matter and to detect petroleum potential in sediments. Total Organic Carbon is a measure of the amount of organic carbon in the sediment (in weight per cent).
XRD-Bulk	X-Ray diffraction analysis of whole rock mineralogy
XRD-Clay	X-Ray diffraction analysis of clay mineralogy
Organic Pet.	Petrographic imaging and description of organic macerals
Thin Section	Thin section of sample
Adsorption Isotherm	Gas adsorption analysis to determine gas-holding capacity of sample
SEM	Scanning electron microscope
Mini-perm	Analysis to determine permeability
Porosimetry	Analysis to determine pore-throat size
Pycnometry	Analysis to determine grain density
Texture with Clay Mineralogy	Determination of sand, silt and clay size distribution in weight per cent with clay mineralogy on clay separates.

Sample No.	Site No.	RockEval TOC	XRD-Bulk	XRD-Clax	Organic Pet.	Thin Section	Adsorption Isotherm	SEM	Mini- perm	Porosimetrx	Pxcnometrx	Texture with Clay Mineralogy
8113	M25	x										
8114	M25	x										
8115	M25	x				x			x			
8116	M25	x										
8117	M25	x			Y							
8118	M25	x										
8119	M14	x							x			z
8120	M14	x										
8121	M14	x										
8122	M14	x			Y							
8123	M33	x										
8124	M33	x			Y							z
8125	M33	x				x						
8126	M33	x	x									
8131	M37	x			Y							
8132	M37	x										
8701	M27	x										
8702	M27	x			Y					x	x	
8703	M27	x										
8704	M27	x										
8705	M28	x			Y			x				
8706	M28	x										z
8707	M28	x				x			x			
8708	M28	x										
8709	M29	x			Y			x				
8710	M29	x										
8711	M29	x										
8712	M29	x										
8713	M29	x										
8714	M29	x			Y							
8715	M29	x										
8716	M20	x										
8717	M20											
8718	M20	x				x			x			
8719	M20	x										
8720	M20	x										
8721	M20	x										
8722	M20	x										
8723	M20	x										
8724	M20	x			Y							
8725	M20	x										
8726	M20											
8727	M20	x										
8728	M20											
8729	M20	x			Y							
8730	M23	x	x	x								
8731	M23							x				
8732	M23	x			Y							
8733	M23											
8734	M23	x										
8735	M23											
8736	M23	x										
8737	M7	x										
8738	M7											
8739	M7	x			Y			x				
8740	M7											
8741	M7											
8742	M7											
8743	M7	x										
8744	M4							x				
8745	M4	x			Y							
8746	M4											
8747	M4	x										
8748	M4											
8749	M4											
8750	M4	x										
8751	M10	x			Y							
8752	M10											
8753	M10	x	x	x								
8754	M10	x										
8755	M10	x			Y							
8756	M10	x										
8757	M10	x			Y							
8758	M19	x										
8759	M19											
8760	M19	x										
8761	M19	x	x	x								
8762	M19	x										
8763	M19											
8764	M19	x								z	x	
8765	M19	x			Y							
8766	M19											
8767	M19	x										
8768	M19	x										
8769	M19											
8770	M19	x			Y							
8771	M19											
8772	M19	x										
8773	M40											
8774	M40	x			Y							
8775	M40											
8776	M40											
8777	M40											
8778	M40											

8704	M27	x										
8705	M28	x			Y			x				
8779	M40											
8780	M40	x										
8781	M15	x										
8782	M15	x										
8783	M15											
8784	M15	x										
8785	M15	x			Y							
8786	M15	x				x			x			z
8787	M15											
8788	M15	x			Y							
8789	M15	x			Y							
8790	M13	x			Y							
8791	M13											
8792	M13	x										
8793	M13	x			Y							
8794	M13	x										
8795	M32											
8796	M32	x			Y							
8797	M32											
8798	M32											
8799	M32	x										
8800	M5	x										
8801	M5											
8802	M5											
8803	M5											
8804	M5											
8805	M5											
8806	M5	x			Y							
8807	M5											
8808	M3	x										
8809	M3											
8810	M3											
8811	M3											
8812	M3											
8813	M3	x			Y							
8814	M3											
8815	M3											
8816	M1											
8817	M1											
8818	M1											
8819	M1	x	x	x	Y							
8820	M1											
8821	M1											
8822	M21	x										
8823	M21	x										
8824	M21	x			Y							
8825	M21											
8826	M21	x										
8827	M21	x										
8828	M22	x										
8829	M22											
8830	M22											
8831	M22	x			Y							
8832	M22											
8833	M22											
8834	M2	x										
8835	M2											
8836	M2											
8837	M2	x										
8838	M2	x										
8839	M2	x										
8840	M2	x				x			x			
8841	M2	x										
8842	M2	x										
8843	M2	x										
8844	M2	x										
8845	M2											
8846	M2											
8847	M2	x			Y							
8848	M2	x										
8849	M2	x										
8850	M2	x										z
8851	M2	x										
8852	M2											
8853	M2	x			Y							
8854	M2	x	x	x								
8855	M2	x										
8856	M2	x							x			z
8857	M2	x										
8858	M2	x						x		z	x	
8859	M30	x										
8860	M30											
8861	M30											
8862	M30	x			Y							
8863	M30											
8864	M30											
8865	M30											
8866	M30	x										
8867	M26	x										
8868	M26											
8869	M26	x										
8870	M26											
8871	M26											
8872	M26											

8704	M27	x										
8705	M28	x			Y			x				
8873	M26											
8874	M26	x			Y							
8875	M9	x			Y							
8876	M9	x										
8877	M9											
8878	M9	x				x		x	x	z	x	
8879	M9	x										
8880	M9											
8881	M9	x										
8882	M11	x										
8883	M11	x										
8884	M11	x										
8885	M11											
8886	M11	x										
8887	M11	x										
8888	M11	x			Y							
8889	M11	x										
8890	M11											
8891	M6	x										
8892	M6											
8893	M6	x										
8894	M6	x										
8895	M6	x				x						
8896	M6											
8897	M6	x	x		Y							
8898	M6	x										
8899	M8	x	x	x								
8900	M8	x										
8901	M8	x						x				
8902	M8	x			Y	x			x			
8903	M8	x										
8904	M8	x								z	x	
8905	M39	x	x									
8906	M39											
8907	M39											
8908	M39	x				x			x	z	x	
8909	M39	x			Y							
8910	M38	x			Y							
8911	M38											
8912	M38	x										
8913	M38											
8914	M38	x										
8915	M38	x										
8916	M35	x										
8917	M35											
8918	M35	x							x			
8919	M35	x	x	x								
8920	M35											
8921	M35	x										
8922	M35											
8923	M35	x			Y							
8924	M35	x				x						
8925	M34											
8926	M34	x						x				
8927	M34											
8928	M34	x			Y							
8929	M34											
8930	M34	x										
8931	M36	x										
8932	M36											
8933	M36	x										
8934	M36	x			Y							
8935	M36	x										
8936	M36	x										
8937	M36	x										
8938	M18	x										
8939	M18											
8940	M18	x										
8941	M18											
8942	M18	x			Y							
8943	M18											
8944	M12											
8945	M12	x										
8946	M12											
8947	M12	x										
8948	M12	x				x						z
8949	M12											
8950	M12	x			Y							
8951	M16	x										
8952	M16	x										
8953	M16	x										
8954	M16											
8955	M16	x										
8956	M31	x				x						
8957	M31	x										
8958	M31	x										
8959	M31	x										
8960	M31											
8961	M31	x			Y							
8962	M31											
8963	M24	x										
8964	M24	x			Y							
8965	M24											
8966	M24	x										

8704	M27	x										
8705	M28	x			Y			x				
8967	M24	x										
8968	M24											
8969	M24	x										
8970	M17											
8971	M17	x										
8972	M17	x										
8973	M17	x			Y							
8974	M17											
8975	M17	x										
8976	M17											
8977	M17	x										
9247	M15	x										
9248	M13	x										
9249	M5	x										
9250	Standard											
9251	M18	x										
9252	M17	x										
9253	M31	x			Y							
9254	M21		x	x								
9255	M23						x					
9256	M10						x					
9257	M2						x					
9258	M6						x					
9259	M8						x					
9260	M34						x					

## Appendix 3 – Organic Petrography Description and Reflectance, Montney and Adjoining Formations

### Legend

Column Label	Label Description
AGS Sample Number	AGS sample number
Well Location - UWI	Unique well identifier
Formation	Formation sampled
GSC Photo No.	GSC photo number
ORG_TYPE	Kerogen type (I to IV)
%Ro <sub>R</sub>	Vitrinite reflectance (per cent random reflectance in oil)
SD	Standard deviation
N	Number of individual measurements
COMMENTS	Sample observations

### Notes

Most of the shale was observed parallel and perpendicular to the bedding.

Not all allochthonous macerals were measured. Those measured are for reference only to determine the %Ro of the reworked maceral; they are not quantitative. Refer to the comments. Histogram data sheet is available upon request.

### Key for Organic Type

2	Vitrinite
2.1, 2.2, 2.3	Refers to reworked populations
3	Vitrinite equivalent (O4) = $0.618 \times \%Ro(\text{bitumen}) + 0.40$ values (Jacob, 1989)
4	Bitumen
40	Inertinite

Name	Well Location	Formation	GSC Photo No.	ORG_TYPE	%Ro <sub>R</sub>	SD	N	COMMENTS
8117	100/06-03-076-12W6/00	Montney	90/09					Mainly a thin interconnected network of dark brown amorphous kerogen (am) with major micrinite (Mi, bright whitish yellow particle) and framboidal pyrite (Py) inclusions brecciated within the intergranular pores of a medium- to coarse-grained siltstone. A trace of vitrinite (V) maceral and rare, inert chitinous (ch) lenses were also observed within the matrix. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	1.02	0.062	5	
				4	0.69	0.003	2	
				2.2	1.45	0.177	7	
8122	100/13-33-067-04W6/00	Montney	91/09					Fine-grained to coarse-grained siltstone with major pyrite (bright whitish-yellow mineral) and micrinite-rich amorphous kerogen (am). Minor Prasinophyte (P) alginite and solid bitumen (B), some having a granular microtexture and some annealed within calcite grains. Traces of hydrocarbon fluid inclusions (hcfi) and yellow-fluorescing asphaltine-like (As) submaceral, and rare siliceous microfossil (S) are also observed. Trace input of allochthonous inertinite macerals. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). V = Vitrinite.
				2	0.83	0.054	7	
				4	0.60	0.050	8	
				4	0.43	0.040	4	
8124	100/12-27-080-13W6/00	Montney	92/09					Bitumen-rich (B) silty shale with a minor amount of pyrite (Py, bright whitish-yellow mineral) and micrinite-rich (Mi) amorphous kerogen (am). Minor Prasinophyte alginite and solid bitumen (B), some having a granular microtexture and some annealed within calcite grains. Traces of hydrocarbon fluid inclusions (hcfi) annealed within quartz minerals and brecciated between intergranular pores (golden yellow). Siliceous microfossils are also observed. Trace input of allochthonous inertinite macerals. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). A = Alginite, ch = chitinous microfossil.
				4	0.77	0.084	62	
8131	102/13-04-083-06W6/00	Montney	94/09	2?	1.10	0.263	2	
								Amorphous kerogen (am) and bitumen-rich (B) mudstone saturated with yellow-orange fluorescing oil with minor pyrite (Py) and micrinite (Mi) inclusions. A minor amount of chitinous (ch) microfossil (mainly highly inert) is present. A rare amount of vitrinite (V) maceral, siliceous (S) microfossils (possibly derived from Radiolaria) and rare orange-fluorescing sporinte (Sp) are also observed. Trace amount of allochthonous inertinite (I) macerals. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). qtz = quartz, V = Vitrinite, P = Prasinophyte. %Ro = 0.389 orange-fluorescing bitumen. The measured %Ro may be lower than the actual %Ro due to suppression by soluble hydrocarbon.
				2	0.77	0.115	23	
				4	0.32	0.051	7	
8702	100/14-09-077-11W6/00	Montney	167/09	2?	1.02	0.048	3	
				2.2	1.33	0.114	3	
								Silty shale with a minor amount of an interconnected network of framboidal, pyrite-rich (Py) and micrinite-rich spent stylocumulates within the intergranular pores of a carbonate-dominated matrix. Noticeably high in biotite with some fluorescing to non-fluorescing primary bitumen (B) lenses. Trace amounts of yellow-fluorescing heavy oil (asphaltine, As) within the intergranular pores of carbonate minerals, and hydrocarbon fluid inclusions (hcfi) within the fractures of carbonates grains. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). A = Alginite, P = Prasinophyte, ch = chitinous microfossil.
8705	100/11-27-077-06W6/00	Montney	168/09	2	0.94	0.05	8	
				2?	1.20	0.17	3	
								Mixture of very fine grained, silty shale to very coarse grained siltstone. Major amount of Prasinophyte (P) alginite and a rare amount of spiny acanthomorphic acritarchs (ac) mainly observed in the framboidal pyrite-rich silty shale matrix. Primary and secondary bitumen (B) are also seen within the intergranular pores of the very fine siltstone matrix with traces of yellow- to orange-fluorescing asphaltine annealed between carbonate grains. The bitumen lenses most likely originated from the stylocumulates between brecciated carbonates grains. Bright yellow-fluorescing hydrocarbon fluid inclusions (hcfi) within the mineral matrix of both silt and shale. There are also trace amounts of chitinous (ch, probably derived from chitinozoans) and siliceous (S, probably derived from radiolaria) microfossils. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X
				2	0.83	0.09	2	
8709	100/05-14-078-11W6/00	Montney	169/09	4	0.56	0.09	7	
				2.2	1.06			
				2.2	1.77	0.23		
								Organically lean, coarse-grained silty shale with mostly pyrite-rich (Py) stylocumulates and spent amorphous kerogen within the intergranular pores of a carbonate matrix. Very few measureable vitrinite lenses; mostly small isotropic bitumen lenses (B). Trace amount of chitinous microfossils (ch), probably derived from crustacean appendages. hcfi = hydrocarbon fluid inclusion. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
8714	100/05-14-078-11W6/00	Montney	170/09	4	0.71	0.04	3	
				4	0.55		1	
				2	0.96		1	
8724	100/06-36-071-04W6/00	Montney	171/09					Coarse grained, silty shale with mostly pyrite-rich (Py), stylocumulates and spent amorphous kerogen within the intergranular pores of a brecciated carbonate matrix. Minor to rare amount of orange fluorescing bitumen (ashpaltine-like texture) and non-fluorescing bitumen (B) within intergranular pores, and yellow orange fluorescing hydrocarbon fluid inclusions (hcfi) within calcite and quartz grains. Trace amount of granular, non-fluorescing hebamorphinite (H) within a pyrite-rich, coarse grained, silty shale matrix and spent phosphatic nodules (ph). Very few measureable vitrinite lenses. ch = chitinous microfossil. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				4	0.73	0.05	14	
				2	0.93	0.04	2	
8724	100/06-36-071-04W6/00	Montney	171/09	2.2	1.35		2	
								Brown, silty shale with a major amount of Prasinophyte (P) alginite widely disperse within pyrite-rich (Py), amorphous kerogen (am). Minor to rare amount of bright, yellow fluorescing soluble oil/asphaltine causing partial saturation in some matrix. Rare yellow fluorescing spiny acanthomorphic acritarch (ac) (sp, 2 to 3 species) and chrysophytes (cp) cyst. Rare, orange fluorescing bitumen and non-fluorescing bitumen (B) within intergranular pores and yellow orange fluorescing hydrocarbon fluid inclusions (hcfi) annealed within calcite and quartz grains and granular pyrite-rich, phosphatic nodules (ph). Very rare, allochthonous inertinite (I) maceral. S = siliceous microfossil. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				4	0.52	0.04	50	
				2	0.70		1	
8724	100/06-36-071-04W6/00	Montney	171/09	2.2	0.90		1	
				4	0.35		1	

Name	Well Location	Formation	GSC Photo No.	ORG_TYPE	%Ro <sub>R</sub>	SD	N	COMMENTS
8729	100/06-36-071-04W6/00	Montney	172/09					Coarse-grained. silty shale with mostly pyrite-rich (Py) stylocumulates and spent amorphous kerogen within the intergranular pores of a carbonate-dominated matrix. Minor amount of non-fluorescing bitumen (B) within intergranular pores, and a rare amount of orange fluorescing bitumen (asphaltine-like texture) and yellow orange fluorescing hydrocarbon fluid inclusions (hcfi) within calcite and quartz grains. Trace amount of granular, non-fluorescing hebamorphinite (H)/matrix bituminite (mB). P = Prasinophyte, ch – chitinous microfossil, ph = phosphatic nodule. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				4	0.59	0.02	6	
				2.40	2.45	0.21	3	
8732	100/05-32-073-12W6/00	Montney	173/09					Organically-rich, dark brown, silty shale with mostly pyrite-rich, spent amorphous kerogen (am) within intergranular pores of a carbonates matrix. A rare amount of yellow orange fluorescing bitumen (asphaltine-like texture) is present and non-fluorescing, mainly granular bitumen (B) within intergranular pores. A very rare amount of siliceous microfossils are present, probably derived from radiolaria (Sr) and chrysophytes (Sc) cyst. Allochthonous inertinite (I) are also observed. Ph = phosphatic nodules. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	1.16	0.10	13	
				4	1.39	0.05	8	
				2.2	1.56	0.07	6	
				2.2	1.81	0.04	2	
8739	103/10-34-064-19W5/0	Montney	174/09					Pyrite-rich (Py) siltstone with very fine grained sandstone matrices and a very rare amount of isotropic, solid, granular, orange-fluorescing migrabitumen (B). Pore-filling dolomite is also observed. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification)
				4	0.69	0.05	8	
				2	0.82		1	
8745	102/11-34-061-19W5/00	Montney	175/09	2?	1.03		1	
								Coarse-grained silty shale with mostly pyrite-rich (Py) stylocumulates (stylo) within the intergranular pores of a carbonate-dominated matrix. A minor amount of non-fluorescing isotropic and granular bitumen (B) is present within intergranular pores and mineral fractures, and a rare amount of orange fluorescing bitumen (asphaltine-like texture) and yellow-orange fluorescing hydrocarbon fluid inclusions (hcfi) within calcite and quartz grains. Trace amount of granular non-fluorescing hebamorphinite(H)/matrix bituminite. P = Prasinophyte. Scale bar applies to all images (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				4	0.73	0.06	3	
8751	100/07-05-067-07W6/00	Montney	176/09	2?	1.15	0.05	3	
								Organically rich, dark brown, silty shale with mostly framboidal pyrite-rich (Py) amorphous kerogen (am) brecciated within the intergranular pores of a carbonate matrix. A minor amount of non-fluorescing, granular, thin lenses of pore-filling and fracture filling primary bitumen (B) is present within intergranular pores. A rare to trace amount of orange fluorescing Prasinophyte (P) alginite and non-fluorescing granular Tasmanites sp? (T) is also present. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). hcfi = hydrocarbon fluid inclusion.
				2	1.12	0.08	5	
8757	100/07-05-067-07W6/00	Montney	177/09	4	0.84	0.04	8	
				4	0.69		1	
								Organically rich brown, silty shale with mostly framboidal pyrite-rich amorphous kerogen brecciated within the intergranular pores of a carbonate matrix. Minor amount of non-fluorescing, large granular and small isotropic lenses of pore-filling and fracture-filling primary bitumen (B) dispersed mainly within intergranular pores. Rare to trace amount of orange-fluorescing Prasinophyte (P) alginite, siliceous microfossils (S, probably derived from radiolaria) and chitinous microfossils (ch, probably derived from chitinozoans), greenish-yellow fluorescing hydrocarbon fluid inclusions (hcfi), and possible calcareous nanofossils (cn). Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). ph = phosphatic nodules.
8765	100/11-28-071-03W6/00	Montney	178/09	2	1.12	0.07	5	
				4	0.8583		1	
								Brown, silty shale with a major amount of dull yellow-fluorescing Prasinophyte (P) alginite widely dispersed within framboidal pyrite-rich amorphous kerogen. Major to minor amounts of bright yellow-fluorescing soluble oil/asphaltine (oil) causing staining and partial saturation. Rare, yellow-fluorescing spiny acanthomorphic acritarch (ac) and possibly chrysophytes. Rare, orange-fluorescing bitumen and non-fluorescing primary bitumen (B) within intergranular pores. Very rare allochthonous inertinite maceral (I). Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). ch = chitinous microfossil
8770	100/11-28-071-03W6/00	Montney	179/09	4	0.57	0.06	6	
				2	0.82	0.07	4	
				4	0.40	0.03	5	
8770	100/11-28-071-03W6/00	Montney	179/09					Brown, silty shale with a major amount of dull yellow-fluorescing Prasinophyte (P) alginite widely dispersed within framboidal pyrite-rich amorphous kerogen. Major to minor amounts of bright yellow-fluorescing soluble oil/asphaltine (oil) causing staining and partial saturation. Rare, yellow-fluorescing spiny acanthomorphic acritarch (ac) and possibly chrysophytes. Rare, orange-fluorescing bitumen and non-fluorescing primary bitumen (B) within intergranular pores. Very rare allochthonous inertinite maceral (I). Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). ch = chitinous microfossil
				2	0.74	0.00	8	
				4	0.56	0.05	2	
				2	0.37	0.06	2	
				2.2	1.25	0.02	3	
8785	100/13-05-068-01W6/00	Montney	180/09					Similar to sample AGS 8770/GSC 179-09. Mainly silty shale with a rare, coarse-grained siltstone matrix. Major amount of Prasinophyte (P) alginite observed mainly in the framboidal pyrite-rich (Py) silty shale. Minor to rare amount of yellow-fluorescing, spiny acanthomorphic acritarchs (ac, <i>Multiplicispraeridium</i> sp. ). Rare primary bitumen (B) was also noted within intergranular pores, some with traces of yellow-fluorescing soluble bitumen. Oil stains (oil) were also observed as being released from the siliceous diatom-like frustules. Very rare, bright yellow-fluorescing hydrocarbon fluid inclusions (hcfi) within the mineral matrix were also observed. There is also a trace amount of chitinous microfossil (ch). S = Siliceous microfossil, L = Leiosphaeridia (L), I = Inertinite. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.75	0.08	14	
				4	0.48	0.07	7	
				2	1.02	0.02	3	
				2	1.18		1	
8788	100/13-05-068-01W6/00	Montney	181/09					Pyrite-rich, siltstone and very fine-grained sandstone with mostly stylocumulates between intergranular pores. Minor amount of isotropic solid and granular primary bitumen (B) and rare orangefluorescing primary bitumen probably derivedfrom the stylocumulates. Very rare small lenses of Prasinophyte (P) alginite pressed between quartz grains. Scale bar applies to all images. (In oil, polished surface, fluorescenc e and reflected white light, 50X magnification). I = Inertinite.
				2	0.93	0.05	3	
				4	0.49	0.05	22	

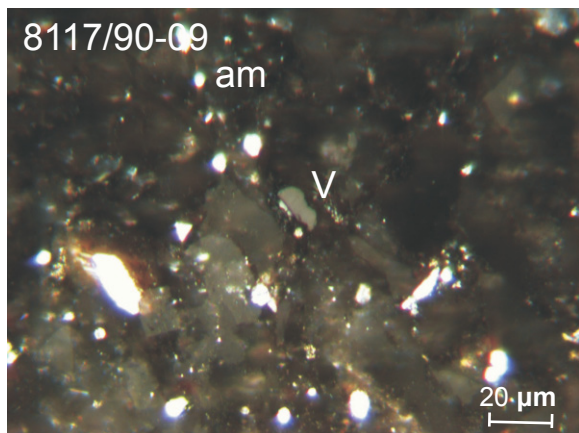
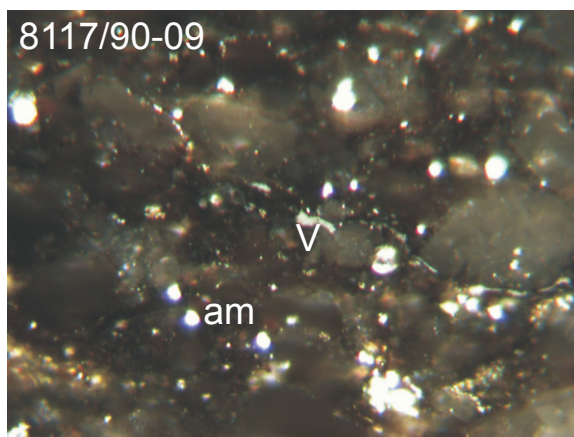
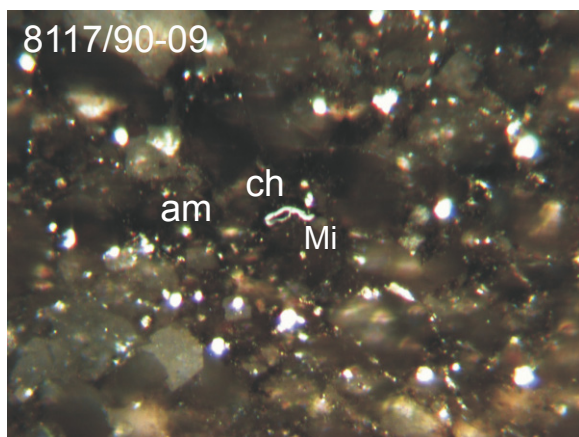
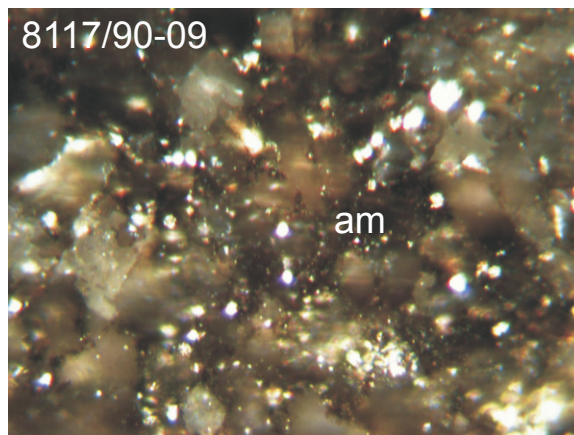
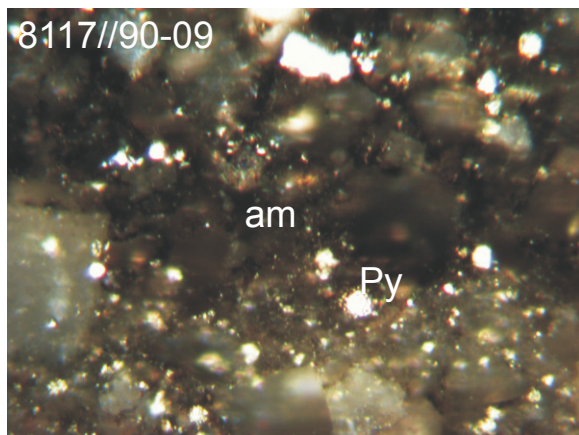


Name	Well Location	Formation	GSC Photo No.	ORG_TYPE	%Ro <sub>R</sub>	SD	N	COMMENTS
8789	100/13-05-068-01W6/00	Montney	182/09	2.2	1.41	0.03	2	Coarse-grained siltstone to very fine grained sandstone with a major amount of hydrocarbon fluid inclusions (hcfi) annealed within carbonate crystals. Minor to rare amount of hebamorphinite (H) and stylocumulates (stylo) between intergranular pores; isotropic, solid (some granular) bitumen (B) derived from stylocumulates and amorphous kerogen lenses. Fracture- and pore-filling secondary migrabitumen most likely derived from the primary bitumen associated with the autochthonous stylocumulates and matrix bitumenite. Siliceous chrysophytes cyst (Sc) microfossils were also observed. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.89	0.03	3	
				4	0.67	0.07	55	
				4	0.40	0.02	2	
8790	100/13-31-067-18W5/00	Nordegg	183/09					Dark brown, silty shale with a major amount of Prasinophyte (P) alginite widely dispersed within framboidal pyrite-rich (Py) amorphous kerogen. Major to minor amount of bright yellow-fluorescing soluble oil/asphaltine causing greenish yellow staining due to saturation. Also present is a major amount of reddish orange-fluorescing and non-fluorescing isotropic primary bitumen (B) within intergranular pores and fractures. Trace amount of siliceous (S, probably derived from radiolaria) and chitinous (ch, probably derived from chitinozoans) microfossils filled with reddish brown-fluorescing solid bitumen. Trace non-fluorescing sporinite (Sp) and alginite (A). Rare allochthonous inertinite maceral. V = vitrinite. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.76	0.07	35	
				4	0.55	0.06	33	
				4	0.35	0.03	5	
8796	102/14-20-079-22W5/00	Montney	184/09	2	1.09	0.05	2	Coarse-grained siltstone to very fine grained sandstone with a major amount of hydrocarbon fluid inclusions (hcfi) within carbonate crystals. Rare amount of stylocumulates (stylo) and amorphous kerogen between intergranular pores. Trace of granular solid bitumen (B) derived from stylocumulates and amorphous kerogen lenses. Fracture- and pore-filling secondary migrabitumen most likely derived from the primary bitumen associated with the autochthonous stylocumulates and matrix bitumenite. Possible siliceous chrysophytes cyst microfossils were also observed. Py = Pyrite. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.68	0.07	42	
				4	0.49	0.05	9	

Name	Well Location	Formation	GSC Photo No.	ORG_TYPE	%Ro <sub>R</sub>	SD	N	COMMENTS
8934	100/11-32-082-25W5/00	Montney	289/09					Organically lean, framboidal pyrite–rich (Py), carbonate-dominated siltstone with a trace amount of very fine grained organic matter. Very rare small vitrinite (V), fluorescing Prasinophyte alginite (P), and carbonate-filled radiolaria (R) lenses. No evidence of fluorescing organic matter. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.79		1	
8755	100/07-05-067-07W6/00	Montney	290/09					Major amount of an interconnected network of amorphous kerogen (am) in siltstone with a high amount of framboidal pyrite inclusions possibly as a result of biodegradation of the organic matter early in its burial history. Rare, thin, long and amorphous lenses of alginite-derived vitrinite (V) maceral and bitumen (B). P = Prasinophyte. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	1.07	0.13		
				2	0.80	0.03		
				4	1.50	0.15		
8774	100/10-21-092-03W6/0	Montney	291/09					Organically lean, carbonate-dominated siltstone with rare amount of mainly framboidal pyrite (Py) and no fluorescing organic matter observed. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				No data				
8793	100/13-310-67-18W5/0	Montney	292/09					Organically lean, carbonate-dominated siltstone with rare amount of mainly framboidal pyrite (Py) and trace amount of thin brown lenses of stylocumulates (stylo). No trace of fluorescing organic matter observed. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.98		1	
8806	100/11-24-062-20W5/0	Montney	293/09					Organically lean, framboidal pyrite–rich (Py) siltstone. Rare amount of amorphous stylocumulates (stylo) between siltstone grains with very rare, small measurable vitrinite lenses. No fluorescing organic matter observed. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	1.052		1	
8813	100/04-06-059-20W5/0	Montney	294/09					Organically lean carbonate-dominated siltstone with mainly pyrite (Py) crystals, a trace amount of very small alginite-derived vitrinite (V) particles, and thin brown lenses of stylocumulates (stylo). No fluorescing organic matter observed. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				4	0.89		1	
8819	100/11-14-057-23W5/0	8821 (Montney, 100/11-14-057-23W5/0)	295/09					Organically lean, carbonate-dominated siltstone with major amount of mainly framboidal pyrite (Py) between carbonate grains and a trace amount of very small, sulphide-rich, anisotropic, alginite-derived vitrinite (V) particles and thin brown lenses of stylocumulates (stylo). No trace of fluorescing organic matter observed. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				No data	0.00			
8824	100/06-33-072-25W5/0	Montney	296/09					Alginite and pyrite-rich (Py), greenish silty shale with mostly non-fluorescing brown alginite lenses to greenish yellow–fluorescing Prasinophyte (P) and acanthomorphic spiny acritarch (ac) in an organically lean siltstone matrix. Trace amount of oil stain (oil) possibly migrating from the organic-rich silty shale. %Ro may be slightly suppressed due to staining. Rare amount of measurable vitrinite (V) and bitumen (B) lenses. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.50	0.06	15	
				2.2	0.72		1	
				2.2	1.05	0.03	4	
				2.2	1.64		1	
8831	100/06-34-072-25W5/0	Montney	297/09					Pyrite-rich (py), organically lean greenish silty shale with minor amount of yellow-fluorescing Prasinophyte (P) alginite and acanthomorphic spiny acritarch (ac) and a rare alginite-derived vitrinite (V) and several bitumen (B) lenses. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.55	0.05	6	
				2	0.66	0.01	2	
					0.929		1	
					2.118		1	
8847	100/16-23-057-06W6	Montney	298/09					Organic-rich, black silty shale comprising mostly an interconnected network of spent kerogen (am = amorphous kerogen) with a high degree of a micrinite inclusions (mc). Very rare measurable vitrinite (V) or bitumen (B) lenses with rare amount of orange-fluorescing Prasinophyte (P), <i>Tasmanites sp.</i> ((T), non-fluorescing with micrinite inclusion (see arrow)) and alginite-derived orange-fluorescing kerogen brecciated between a fine-grained carbonate matrix. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.97	0.12	3	
8853	100/16-23-057-06W6/0	Montney	299/09					Organic-rich, black silty shale consisting mostly of an interconnected network of spent kerogen (am = amorphous kerogen) with micrinite (mc) inclusions. Very rare vitrinite (V) or bitumen (B) lenses and thin orange-fluorescing alginite lenses in a very fine grained siltstone matrix. Trace amount of phosphatic nodules (ph), radiolaria (R) and fluorescing acritarch (ac). Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	1.17		1	
				4	0.93	0.08	6	
				4	0.66	0.13	2	
8862	102/11-34-078-02W6/0	Montney	300/09					Pyrite-rich (Py), organically lean, greenish silty shale with a minor amount of yellow-fluorescing Prasinophyte (P) alginite, and acanthomorphic spiny acritarch (ac). Rare amount of measurable vitrinite (V) and bitumen (B) lenses. There are also traces of soluble oil (oil) and oil stain (oil stain) found between intergranular pores. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.60	0.06		
				4	0.36		1	
8874	100/15-06-076-03W6/0	Montney	301/09					Pyrite-rich (Py), organically lean, greenish silty shale with rare amount of yellow-fluorescing Prasinophyte (P) alginite, mainly between intergranular pores, and acanthomorphic spiny acritarch (ac) and Tasmanites sp. (T). Rare amount of measurable of vitrinite (V) and bitumen (B) lenses. There are also traces of oil stain (oil stain) found between intergranular pores. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.74	0.06	11	
				4	0.54	0.05	7	
				4	0.36	0.02	2	
				2.2	1.08		1	
8875	100/16-31-066-23W5/0	Montney	302/09					Organically lean, greenish silty shale with a trace amount of yellow-fluorescing Prasinophyte (P) and other alginite lenses observed between intergranular pores. Rare amount of measurable vitrinite (V) and bitumen (B) lenses with a trace of oil stain. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.52	0.01	2	
				4	0.41		1	
				4	0.72	0.05	4	

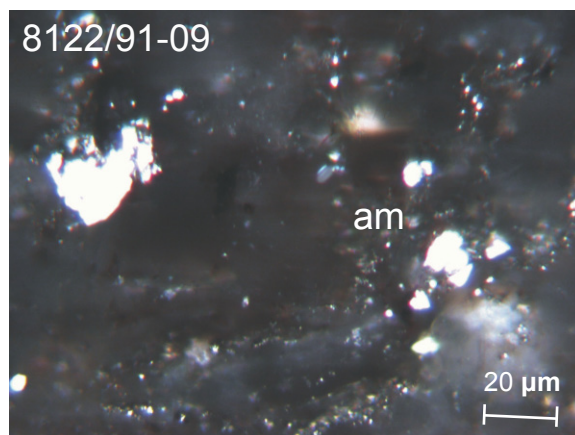
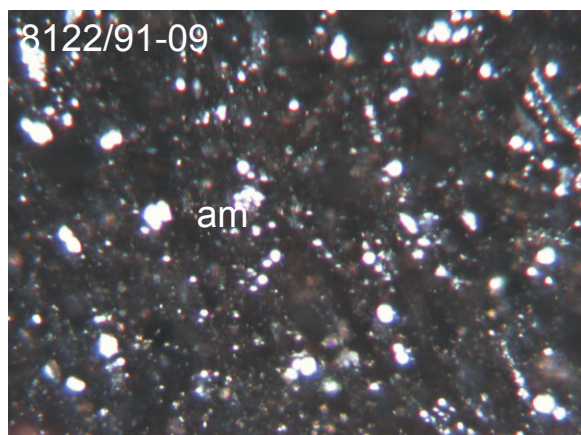
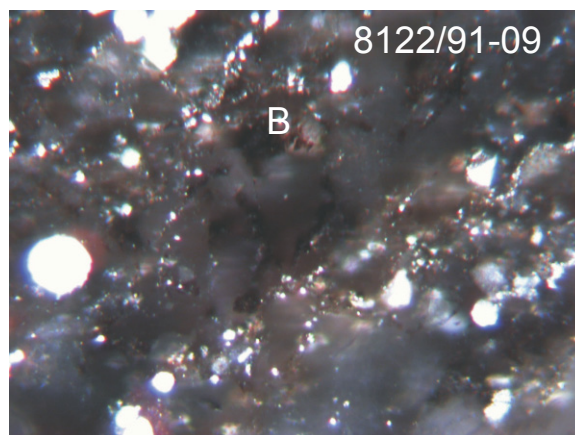
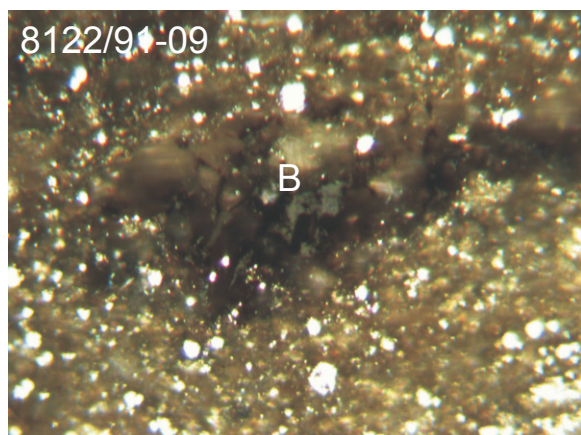
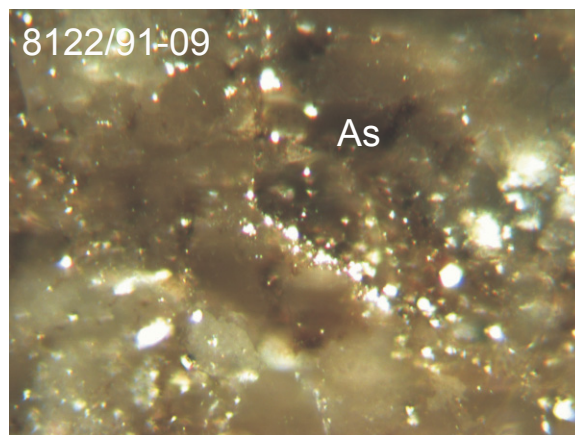
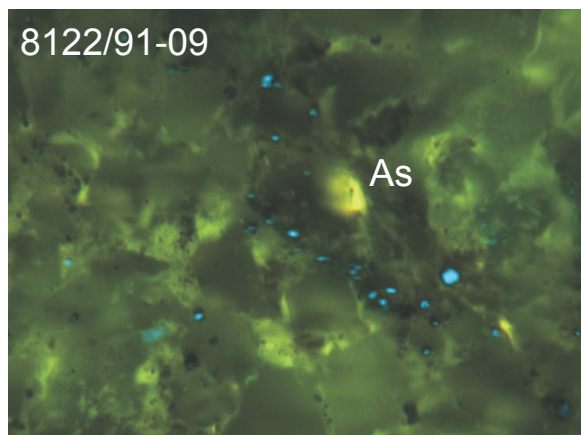
Name	Well Location	Formation	GSC Photo No.	ORG_TYPE	%Ro <sub>R</sub>	SD	N	COMMENTS
8888	100/12-07-067-24W5/0)	Montney	303/09					Alginite and pyrite-rich (Py), greenish silty shale with a major to minor amount of yellow-fluorescing Prasinophyte (P) alginite lenses observed between intergranular pores and a rare amount of yellow-fluorescing soluble oil (oil) within a silty shale matrix. Rare amount of measurable vitrinite (V) and bitumen (B) lenses with a trace of oil stain (oil stain). %Ro may be suppressed. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.71	0.03	2	
				4	0.53	0.04	6	
				2.2	0.95	0.09	4	
				2.2	1.61		1	
8897	100/07-14-067-25W5/0	Montney	304/09					Pyrite-rich (Py), silty shale with minor amount of weak orange-fluorescing Prasinophyte (P) alginite lenses observed between intergranular pores. A trace of non-fluorescing to fluorescing bitumen (B) and thin lenses of stylocumulates (stylo) were observed between grain pores and fractures, with a rare amount of yellow-fluorescing soluble oil (oil) possibly migrating from the organic-rich, silty shale. Rare amount of measurable vitrinite (V) and bitumen (B) lenses. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.65	0.04	6	
				4	0.43	0.05	18	
				2.2	0.85	0.02	2	
8902	100/06-14-066-06W6/0	Montney	305/09					Organic-rich, black silty shale comprising mostly an interconnected network of spent kerogen with high amount of micrinite (mc) and framboidal pyrite (Py) inclusions. Rare orange-fluorescing alginite and Prasinophyte (P) and other alginite-derived fluorescing organic lenses brecciated between silt-size carbonate grains. Rare oil stains were also observed inside some pores. Rare amount of measurable vitrinite (V) or bitumen (B) lenses and thin orange-fluorescing alginite lenses between a very fine grained siltstone matrix. Trace amount of phosphatic nodules (Ph) and calcite-filled, siliceous acanthomorphic marine acritarch (ac), possibly radiolaria (R). (In oil, polished surface, fluorescence and reflected white light, 50X magnification). Oil = soluble oil; am = amorphous kerogen.
				2	1.03	0.06	2	
				4	0.82		1	
				2.2	2.30		1	
8909	102/01-14-091-12W6/0	Montney	306/09					Organically lean, silty shale with a minor amount of alginite-derived stylocumulates (stylo) and weak orange-fluorescing bitumenite (Bt). Rare bright yellow–fluorescing Prasinophyte alginite (P) and Tasmanites sp. (T), acanthomorphic spiny acritarch (ac), and chitinous (ch) lenses (possibly fishbone), Trace amount of non-fluorescing to fluorescing bitumen (B) and yellow-fluorescing soluble oil (oil). Rare measureable of vitrinite (V) and bitumen (B) lenses. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				4	0.43	0.02	4	
				4	0.36	0.03	5	
8910	100/04-32-084-12W6	Montney	307/09					Pyrite-rich (Py), greenish silty shale with a minor amount of greenish yellow–fluorescing alginite and weakly brown-fluorescing bitumenite (Bt). A minor amount of yellow-fluorescing Prasinophyte alginite (P) is present with a rare amount of measurable vitrinite coaly lenses (V) and bitumen (B). Trace of yellow-fluorescing oil stain. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.68	0.03	6	
				2?	0.56	0.04	18	Suppressed %Ro due to staining
				4	0.40	0.09	8	
				2.2	1.69		1	
8923	100/14-30-082-07W6	Montney	308/09					Mixture of organically lean siltstone, alginite and pyrite-rich (Py), greenish silty shale. Major amount of non-fluorescing to greenish yellow–fluorescing Prasinophyte (P) alginite (A) with rare spiny acanthomorphic acritarch (ac) observed primarily in the silty shale matrix, and rarely observed in the coarse-grained siltstone matrix. Rare vitrinite coaly lenses (V) and bitumen (B, some fluorescing). (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.65	0.04	6	
				4	0.41	0.03	28	%Ro may be suppressed.
				4	0.31	0.04	12	Fluorescing
8928	100/15-08-081-12W6	Montney	309/09					Siltstone with a minor amount of stylocumulate (stylo) lenses observed between intergranular pores of carbonate grains and within fractures. Rare vitrinite coaly lenses (V) and bitumen (B) from alginite-derived stylocumulates. Trace amount of bright yellow– fluorescing hydrocarbon fluid inclusion (hcfi) annealed within quartz and calcite minerals. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	0.79		1	
				2	0.71	0.02	4	Small particle size
				4	0.53	0.06	42	
				4	0.39	0.01	4	
8942	100/02-30-71-20W5	Montney	310/09	No Data				Organically lean siltstone with rare pyrite (Py) and small non-fluorescing and yellow-fluorescing alginite (A; possibly Prasinophyte (P)) lenses. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
8950	100/14-27-067-08W6	Montney	311/09					Organic-rich, black silty shale comprising mostly an interconnected network of amorphous kerogen (am). A minor amount of mostly granular bitumen (B) with pyrite (Py) and micrinite inclusions within a fine-grained carbonate matrix. Also observed were rare pyrite-rich phosphatic nodules (ph), weakly fluorescing Tasmanites sp. (T), calcite-filled radiolaria (R) and rare hydrocarbon fluid inclusion (hcfi). (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				4	0.78		1	
				4	0.63	0.01	2	
				4	0.44	0.05	2	
				2.2	1.36		1	
8961	100/06-12-079-12W6/0	Montney	312/09					Organic-rich, black silty shale comprising mostly stylocumulates (stylo) and amorphous kerogen (am) between the intergranular pores of a carbonate matrix. Also observed are rare, yellow-fluorescing hydrocarbon fluid inclusions (hcfi) annealed within quartz and calcite minerals. Rare vitrinite coaly lenses (V) and bitumen (B) lenses. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). %Ro may be slightly suppressed.
				2	0.72	0.07	18	
				4	0.56	0.04	24	
				4	0.47	0.01	8	
				2.2	1.07	0.13	3	

Name	Well Location	Formation	GSC Photo No.	ORG_TYPE	%Ro <sub>R</sub>	SD	N	COMMENTS
8964	100/01-14-075-11W6/0	Montney	313/09					Organic-rich and pyrite-rich (Py) black shale with a major amount of orange-fluorescing alginite and a minor amount of measurable small vitrinite (V) and bitumen (B) lenses. Mostly comprising stylocumulates, amorphous kerogen (am) with a major amount of yellow orange–fluorescing Prasinophyte (P) alginite, and rare acanthomorphic acritarch (ac) inclusions between the intergranular pores of a carbonate matrix. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).
				2	1.00	0.08	24	
				4	0.80	0.04	9	
				4	1.25	0.03	2	
				2.2	1.44	0.11	2	
8973	100/05-24-068-22W5/0	Montney	314/09					Minor amount of measurable bitumen (B) and coaly lenses with rare stylocumulate (stylo) lenses observed brecciated between carbonate grains and within fractures of a mainly coarse-grained siltstone matrix. Rare fluorescing bitumen lenses and trace chitinous (ch) microfossils, possibly from fish remains. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). Py = pyrite.
				4	0.57	0.04	17	
				4	0.46	0.03	15	
				4	0.31	0.04	2	Fluorescing bitumen

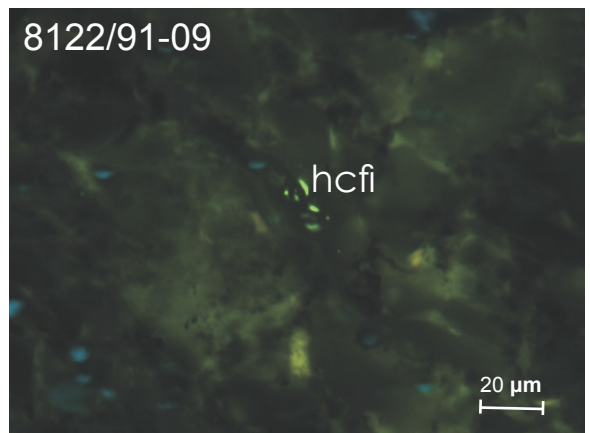
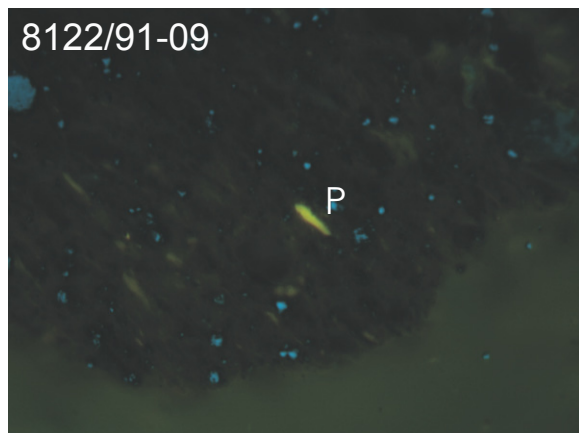
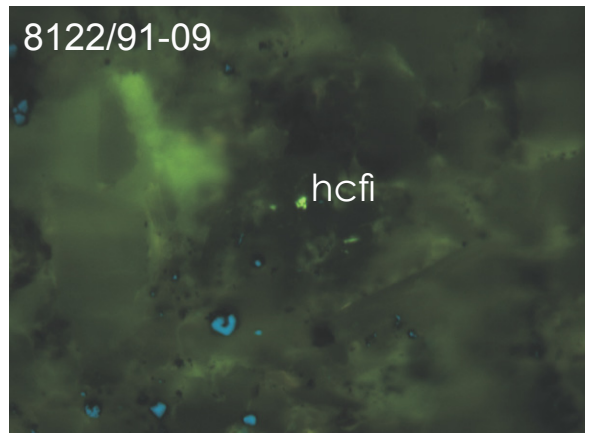
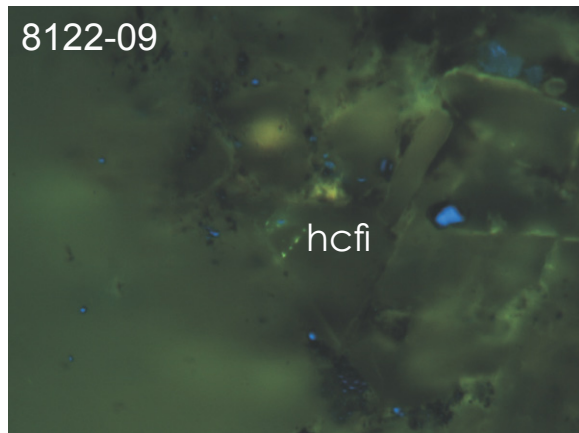
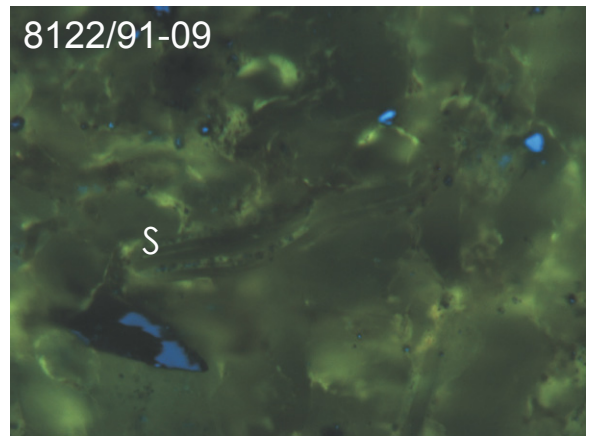
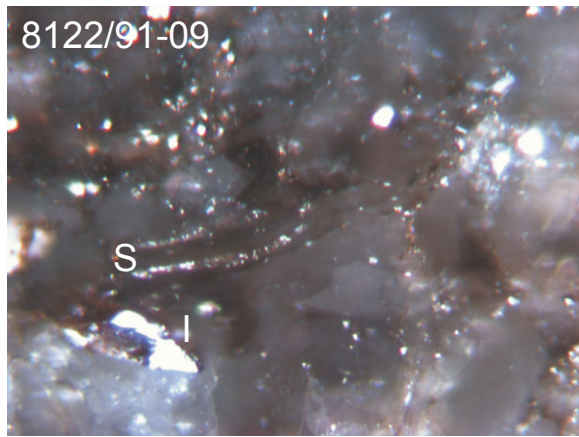


AGS 8117/GSC 90-09 (Montney; 100/06-03-076-12W6/00, 2629.1 m core depth). Mainly a thin, interconnected network of dark brown amorphous kerogen (am) with major micritite (Mi, bright whitish-yellow particle) and framboidal pyrite (Py) inclusions brecciated within the intergranular pores of a medium- to coarse-grained siltstone. A trace of vitrinite (V) maceral and rare, inert chitinous (ch) lenses are also observed within the matrix. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

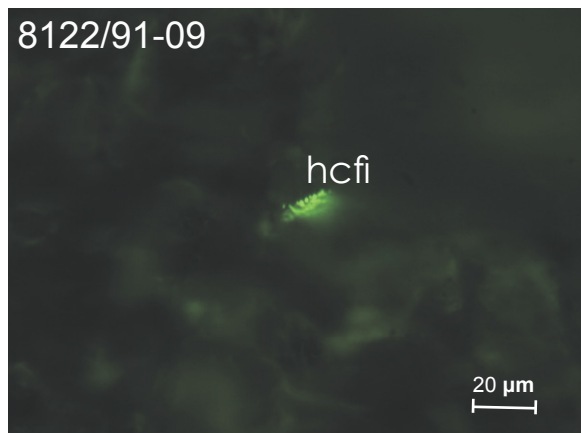
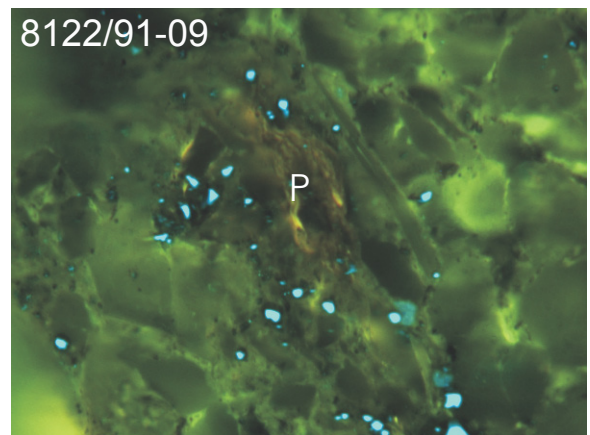
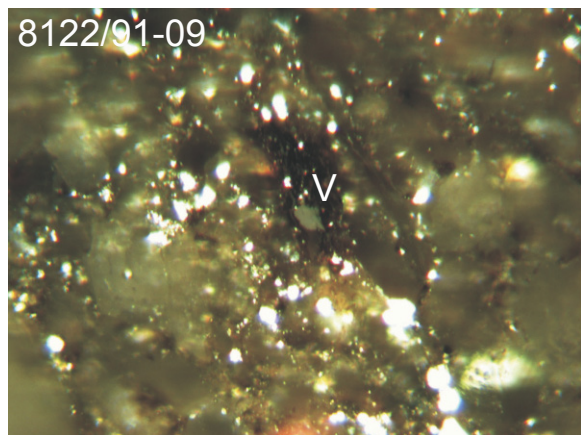
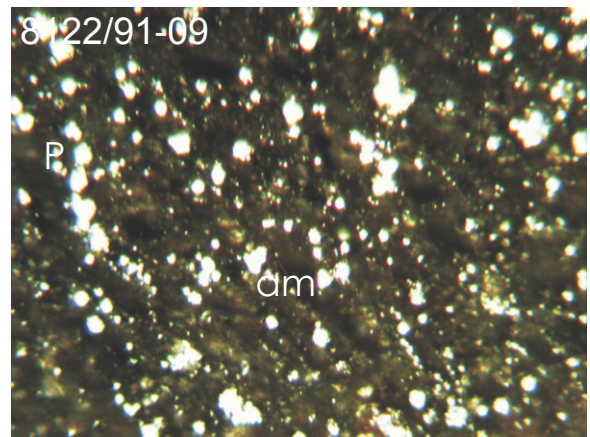
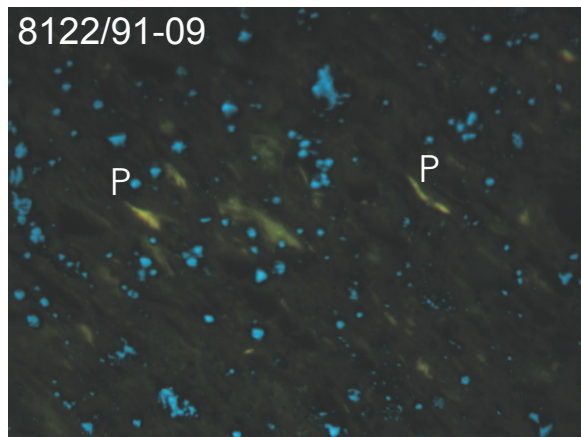




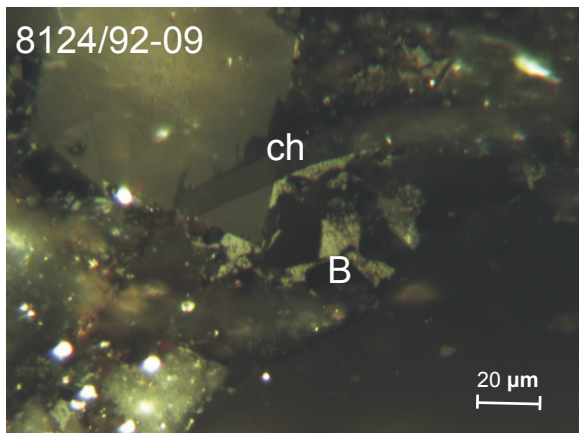
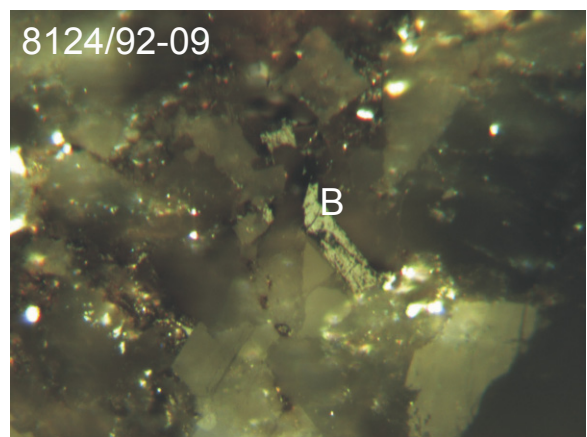
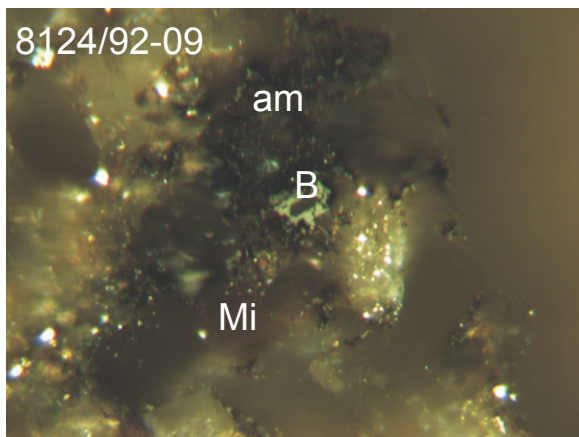
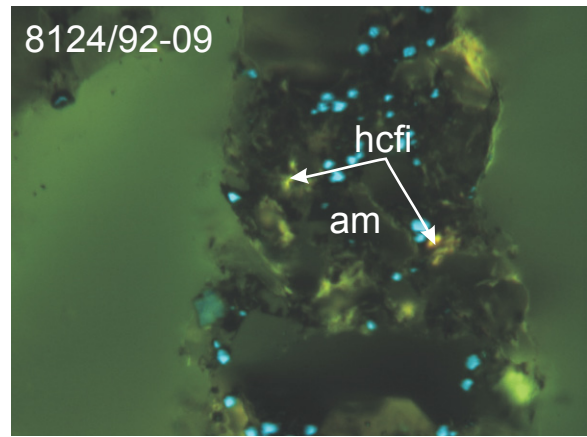
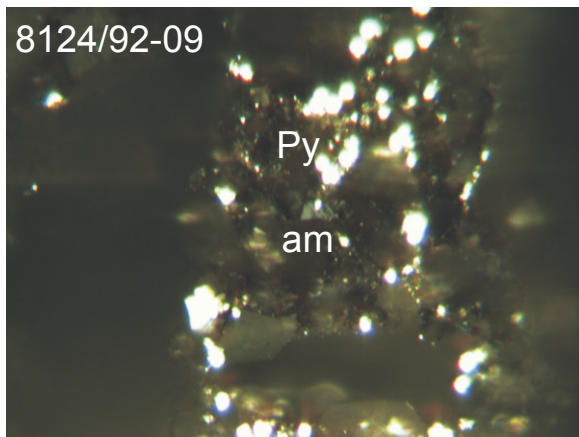
AGS 8122/GSC 91-09 (Montney; 100/13-33-067-04W6/00 , 2379.4 m core depth). Fine-grained to coarse-grained siltstone with major pyrite (bright whitish-yellow mineral) and micrinite-rich amorphous kerogen (am). Minor Prasinophyte (P) alginite and solid bitumen (B), some having a granular microtexture and some annealed within calcite grains. Traces of hydrocarbon fluid inclusions (hcfi) and yellow-fluorescing asphaltene-like (As) submaceral, and rare siliceous microfossil (S) are also observed. Trace input of allochthonous inertinite macerals. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). V = Vitrinite.



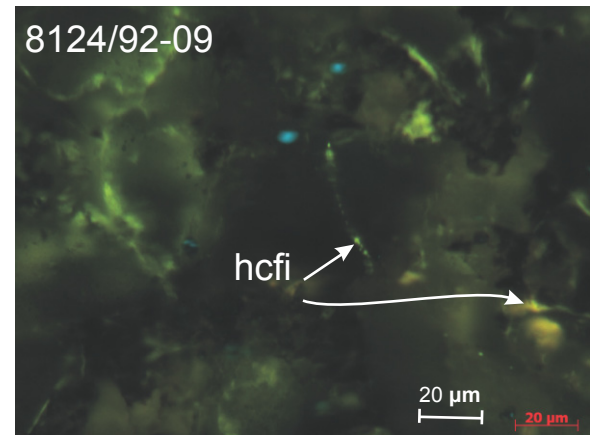
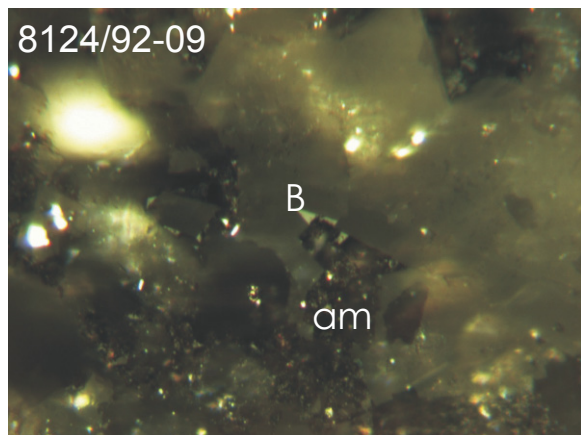
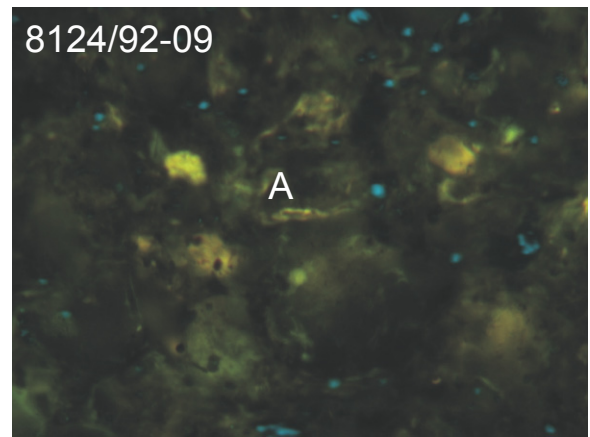
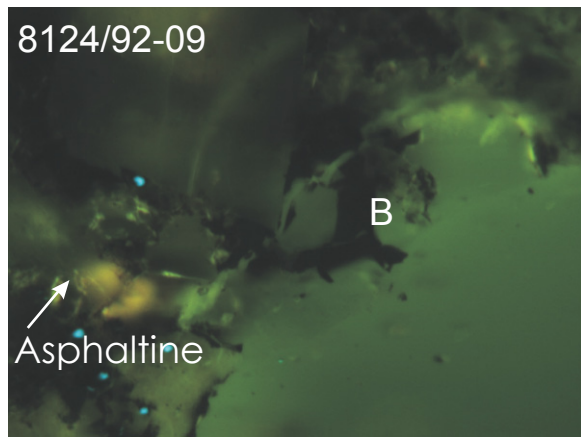


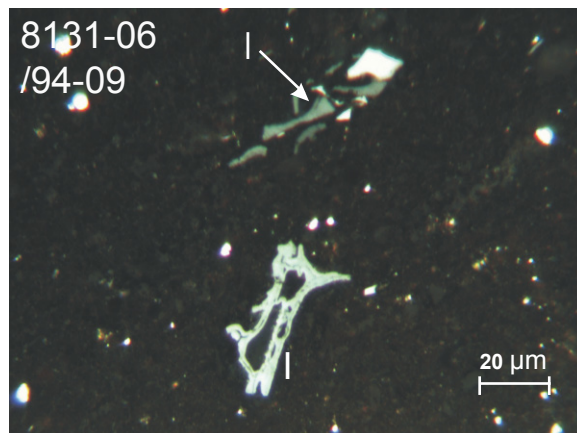
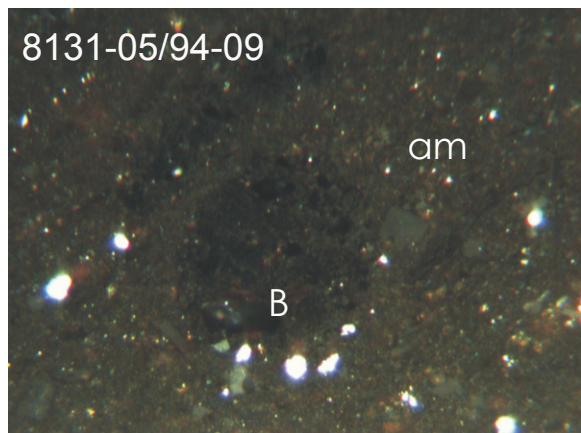
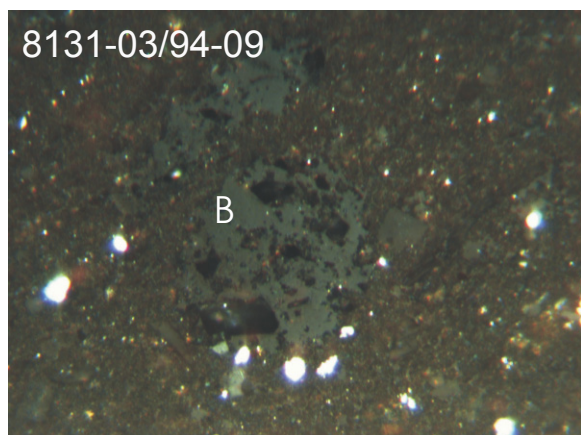
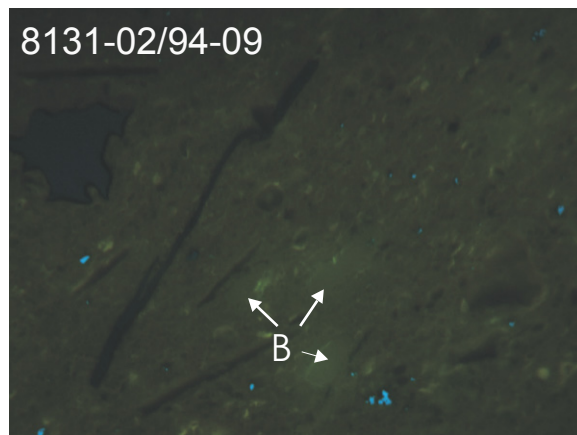
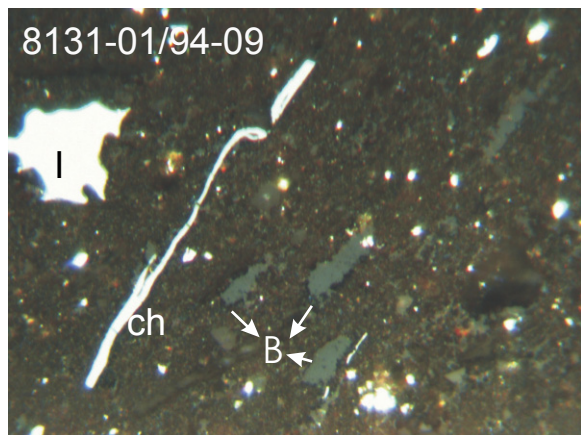






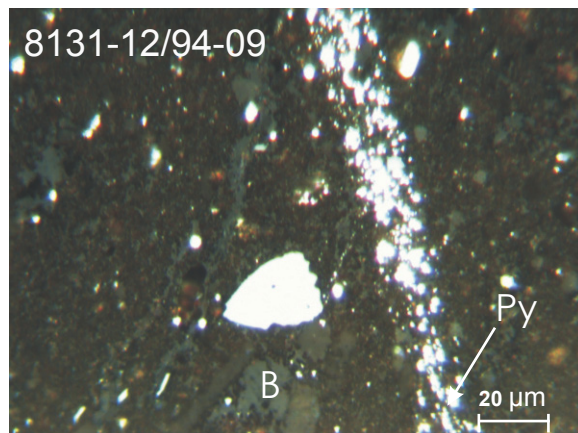
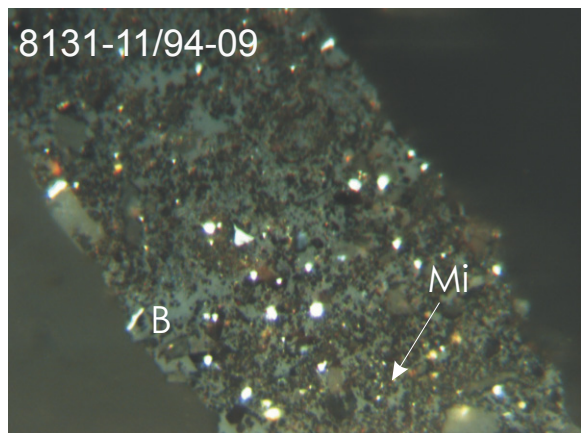
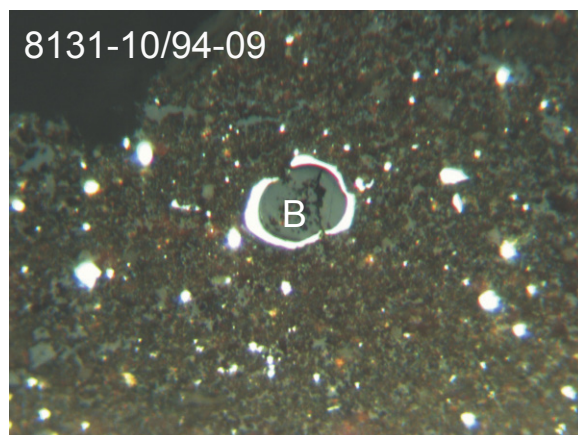
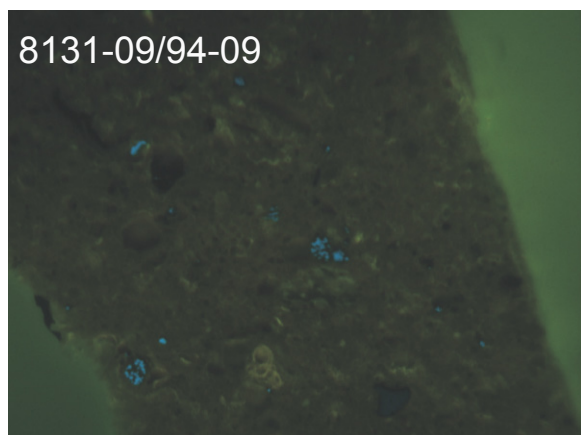
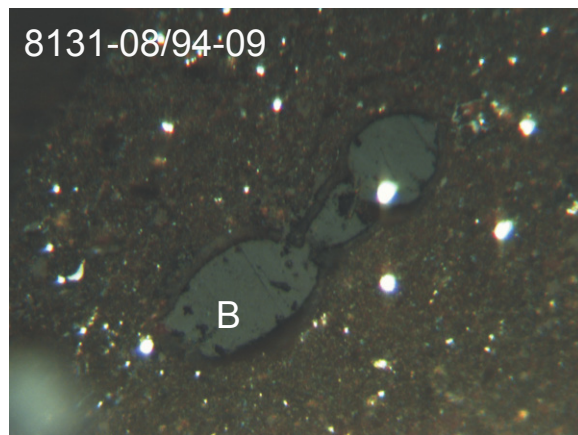
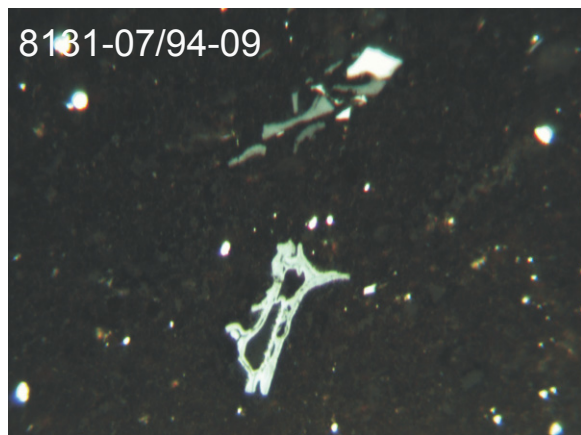
AGS 8124/GSC 92-09 (Montney; 100/13-33-067-04W6/00, 1743.9 m core depth). Bitumen-rich (B) silty shale with a minor amount of pyrite (Py, bright whitish-yellow mineral) and micrinite-rich (Mi) amorphous kerogen (am). Minor Prasinophyte alginite and solid bitumen (B), some having a granular microtexture and some annealed within calcite grains. Traces of hydrocarbon fluid inclusions (hcfi) annealed within quartz minerals and brecciated between intergranular pores (golden yellow). Siliceous microfossils are also observed. Trace input of allochthonous inertinite macerals. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). A = Alginite, ch = chitinous microfossil.

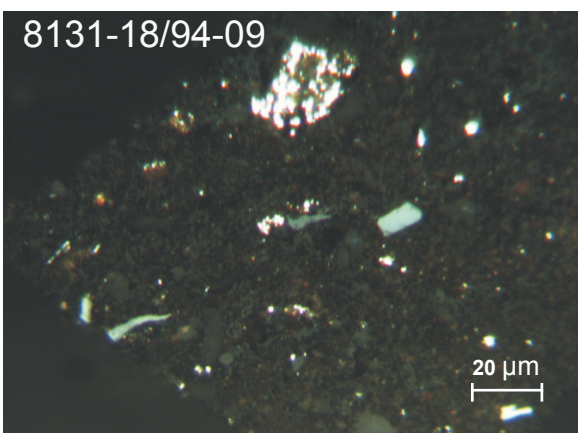
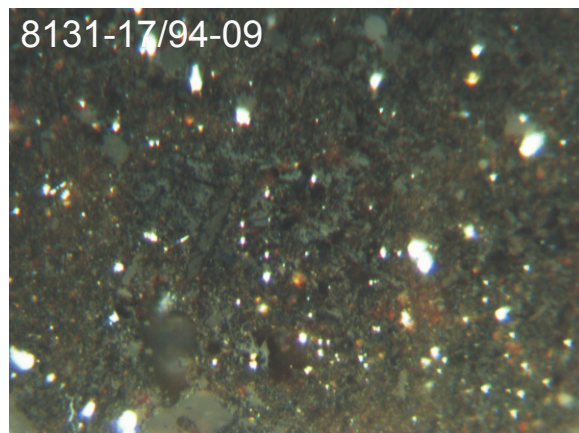
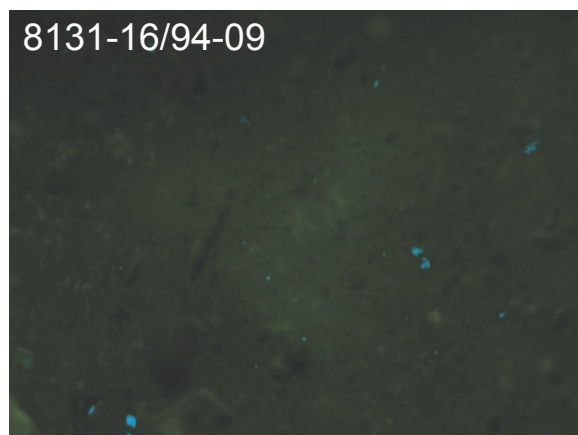
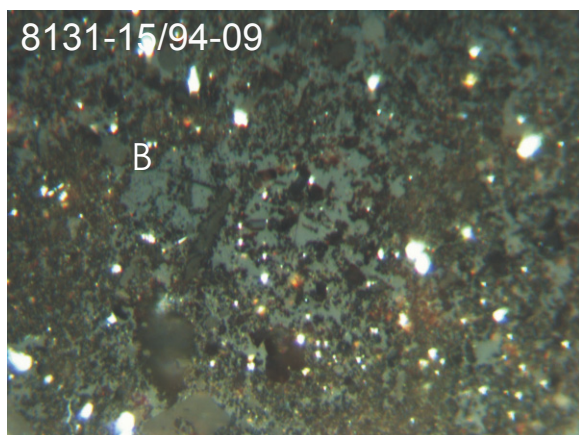
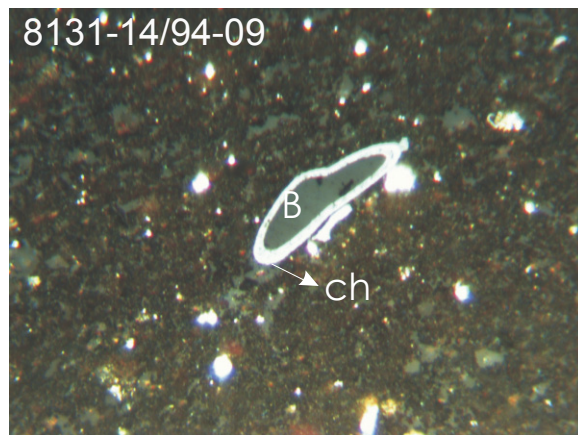
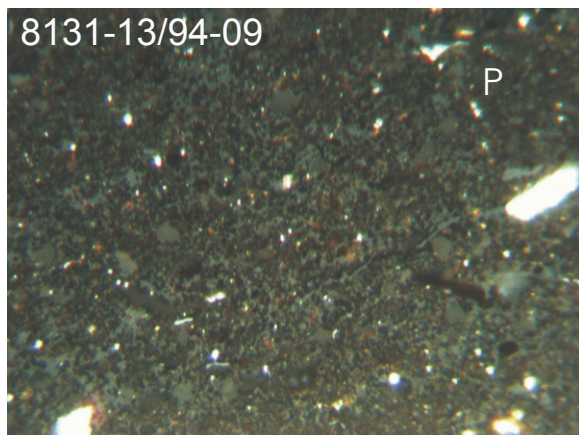




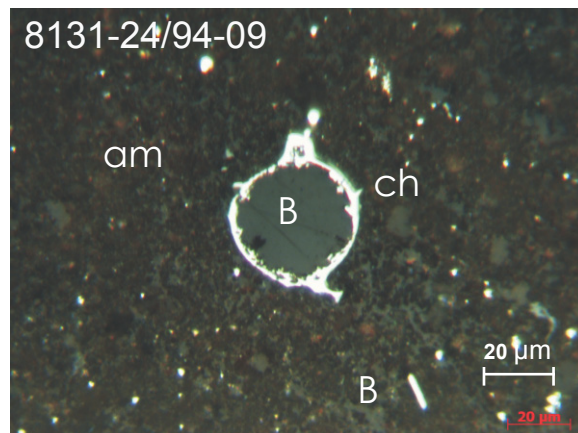
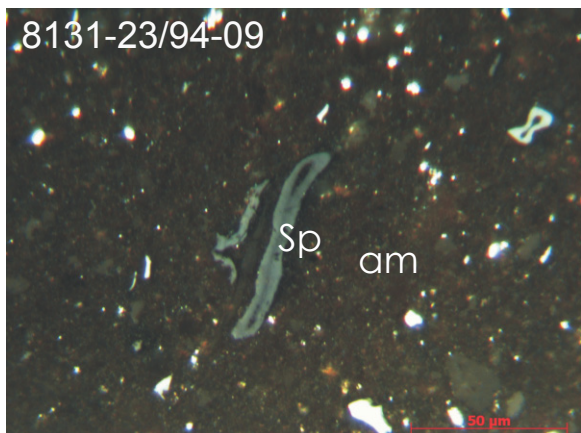
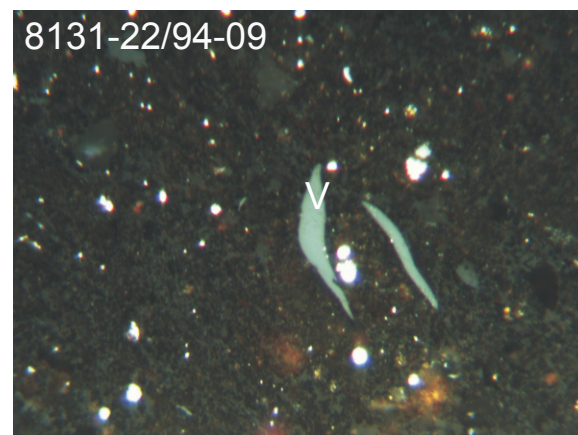
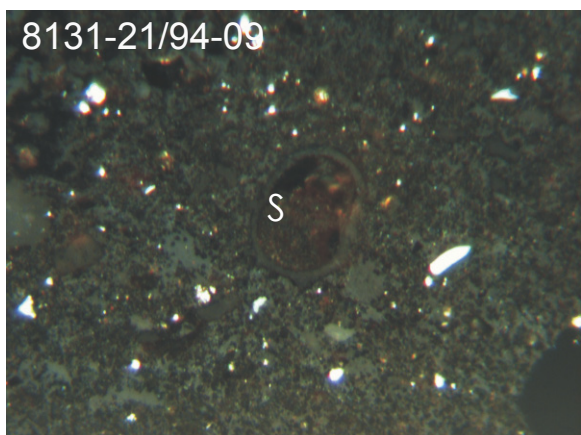
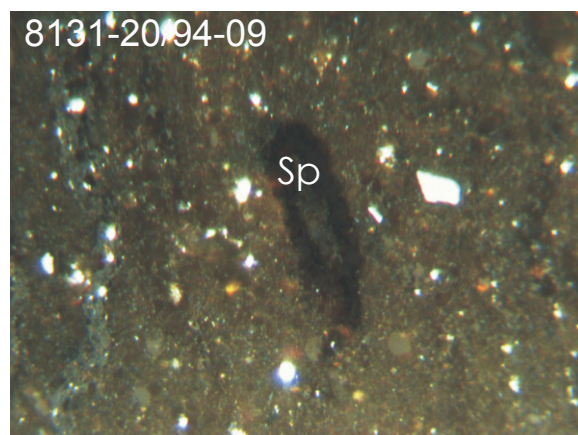
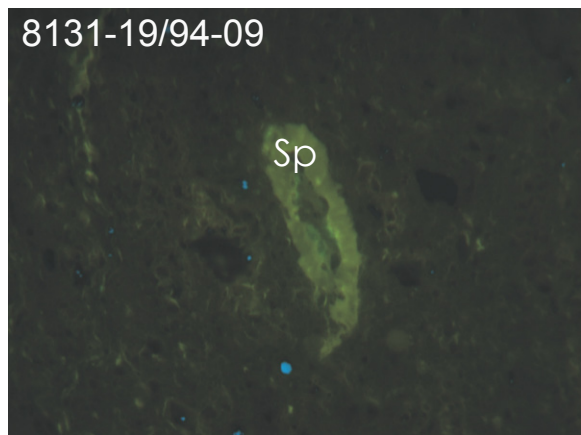
AGS 8131/GSC 94-09 (Montney; 102/13-04-083-06W6/00, 1080.5 m core depth). Amorphous kerogen (am) and bitumen-rich (B) mudstone saturated with yellow-orange fluorescing oil with minor pyrite (Py) and micrinite (Mi) inclusions. A minor amount of chitinous (ch) microfossil (mainly highly inert) is present. A rare amount of vitrinite (V) maceral, siliceous (S) microfossils (possibly derived from Radiolaria) and rare orange-fluorescing sporinite (Sp) are also observed. Trace amount of allochthonous inertinite (I) macerals. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). qtz = quartz, V = Vitrinite, P = Prasinophyte.

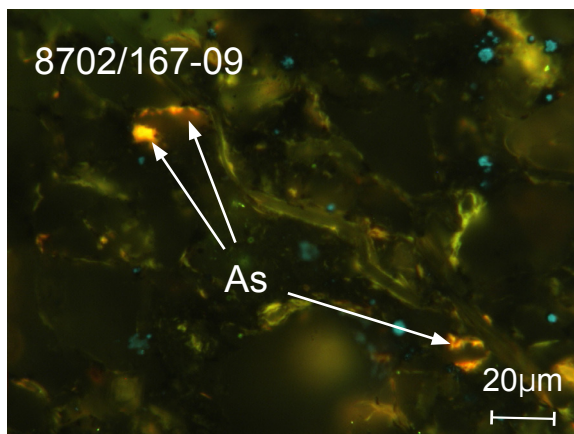
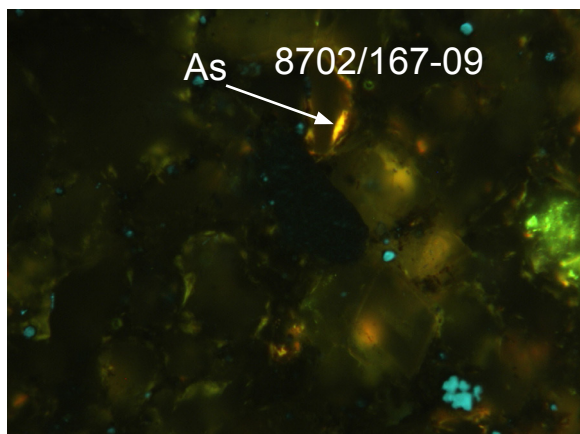
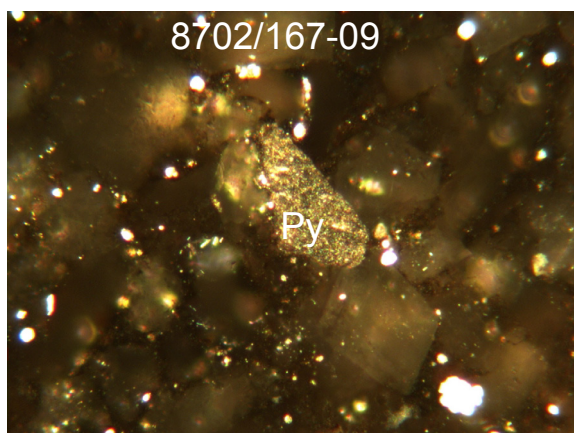
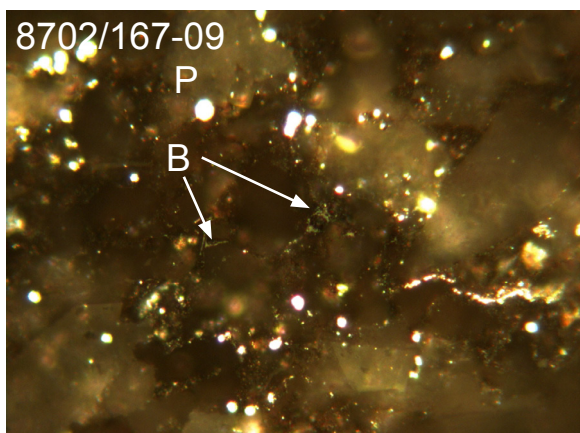
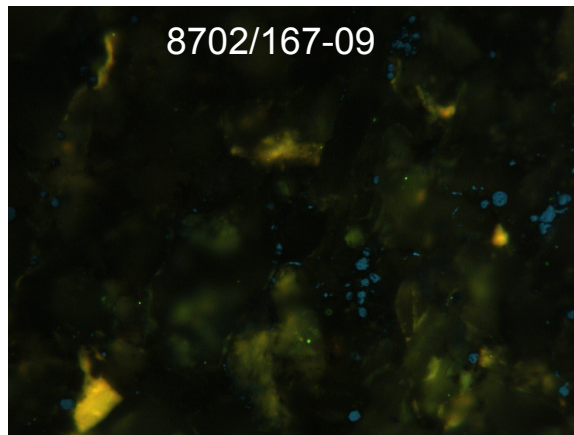
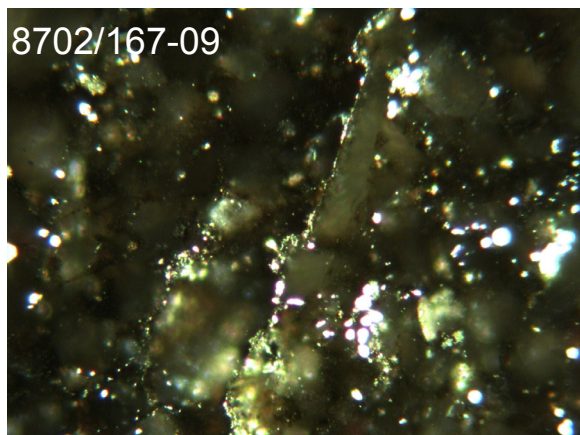






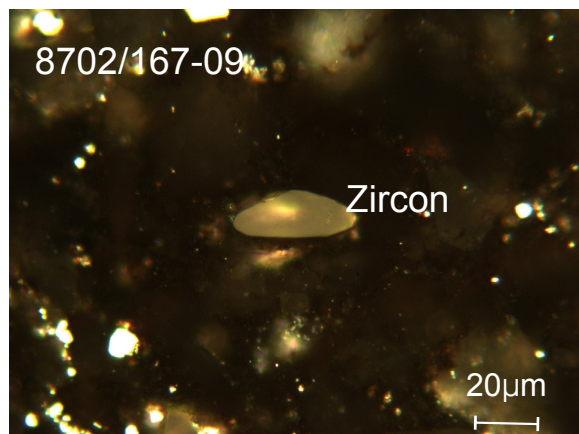
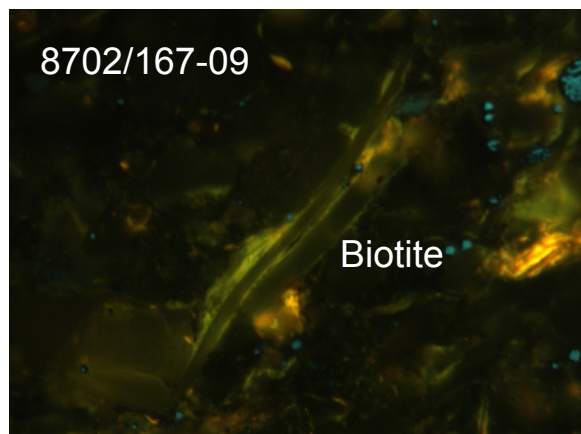
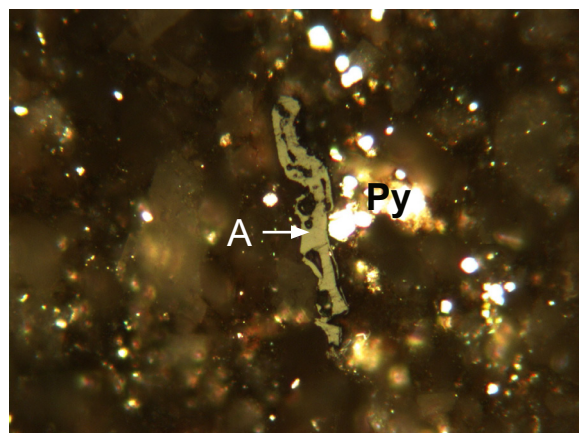
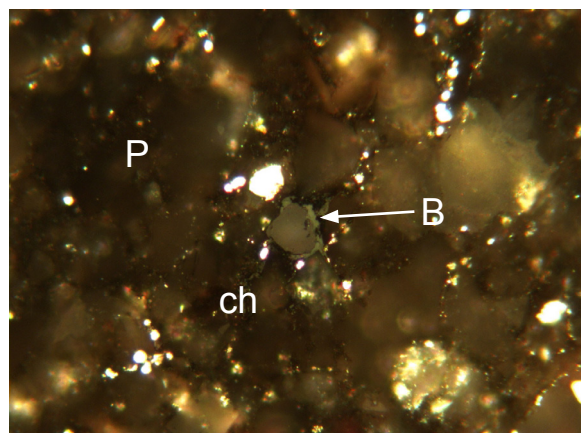
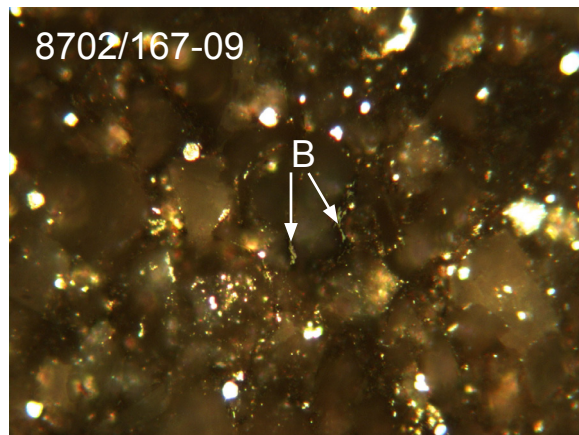
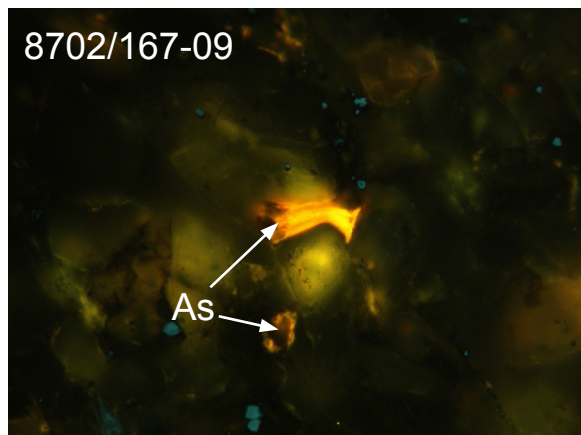




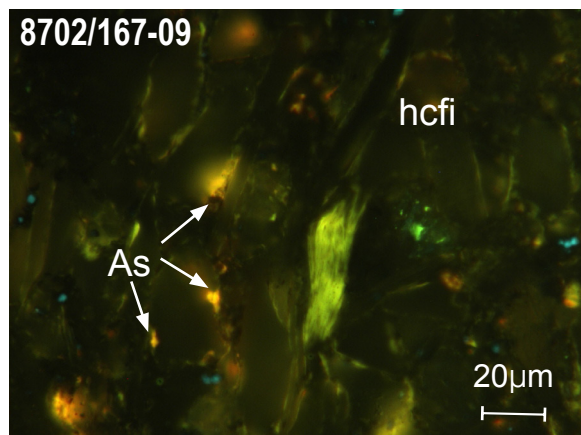


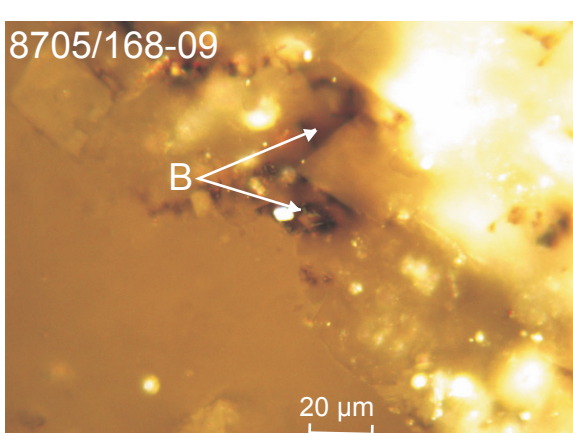
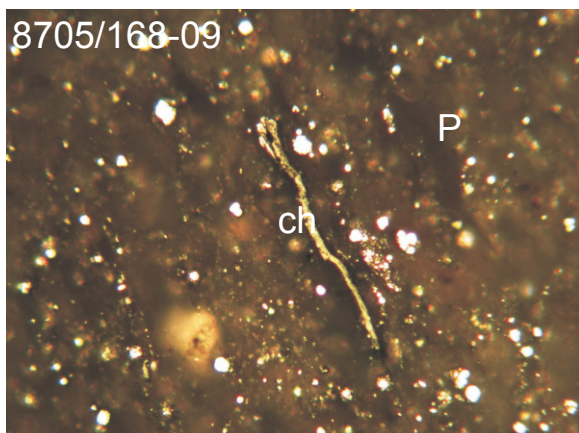
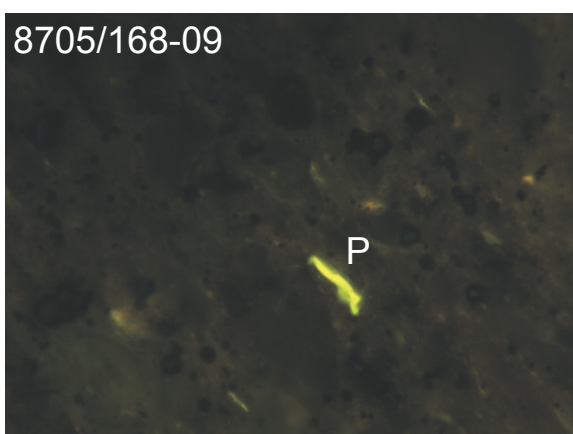
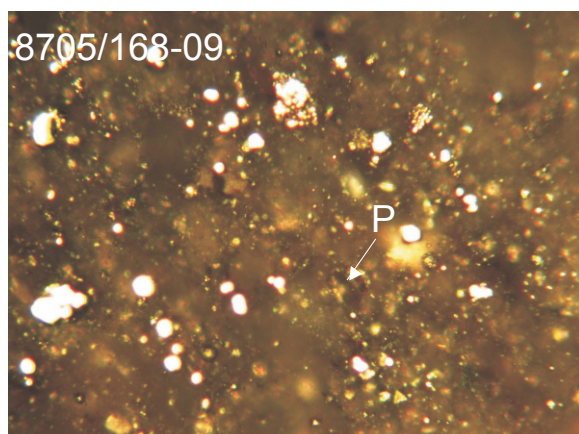
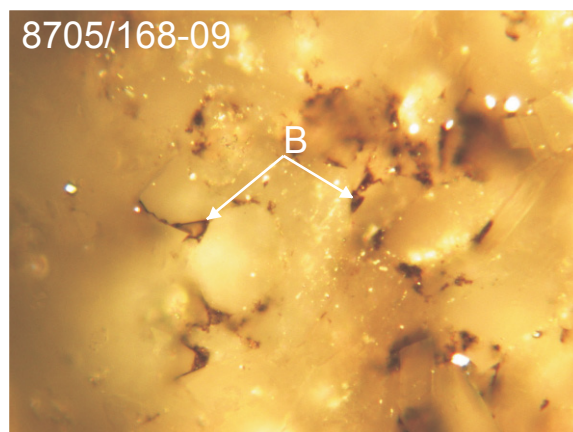
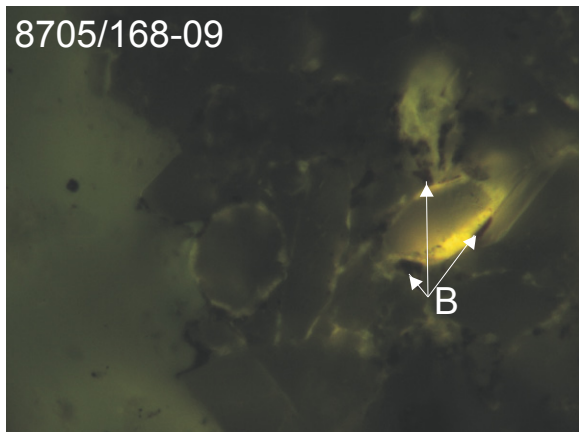
AGS 8702/GSC 167-09 (Montney; 100/14-09-077-11W6/00, 1088.9 m core depth). Silty shale with a minor amount of an interconnected network of framboidal, pyrite-rich (Py) and micrinite-rich spent stylocumulates within the intergranular pores of a carbonate-dominated matrix. Noticeably high in biotite with some fluorescing to non-fluorescing primary bitumen (B) lenses. Trace amounts of yellow-fluorescing heavy oil (asphaltine, As) within the intergranular pores of carbonate minerals, and hydrocarbon fluid inclusions (hcfi) within the fractures of carbonates grains. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). A = Alginite, P = Prasinophyte, ch = chitinous microfossil.



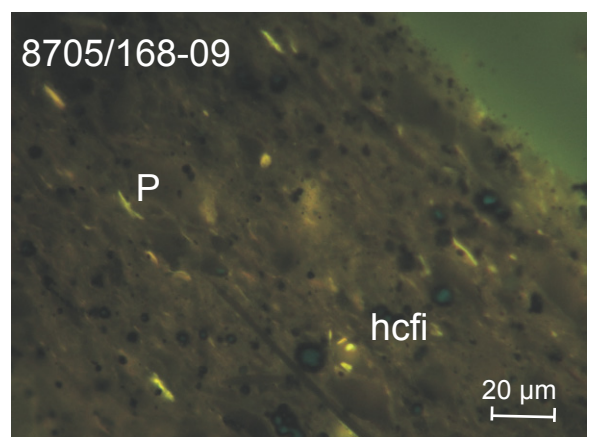
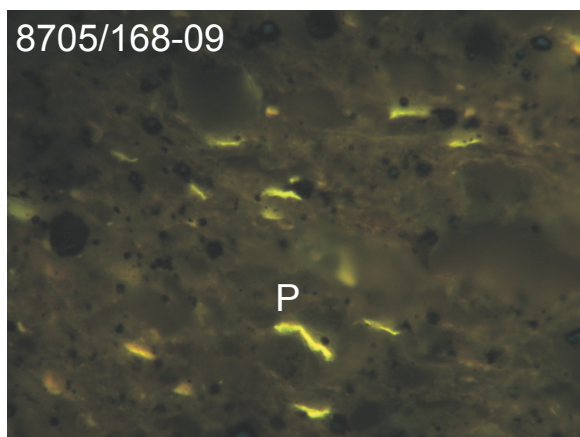
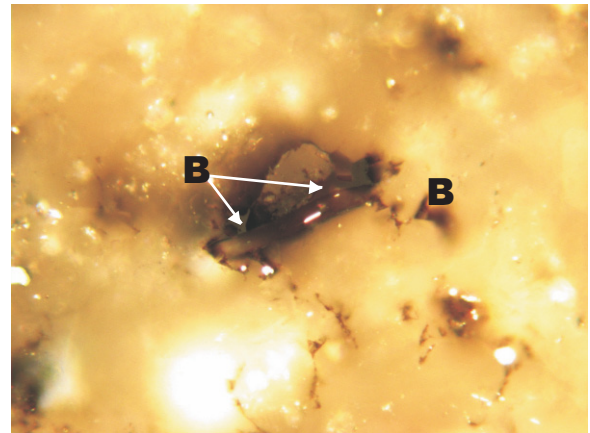
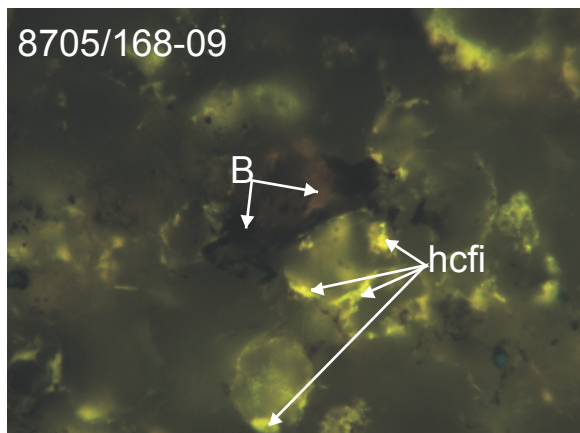
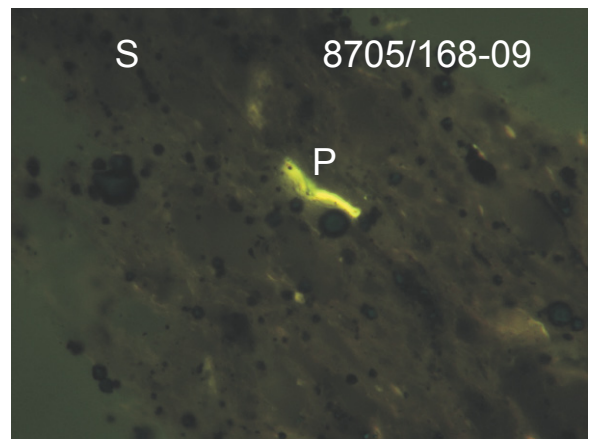
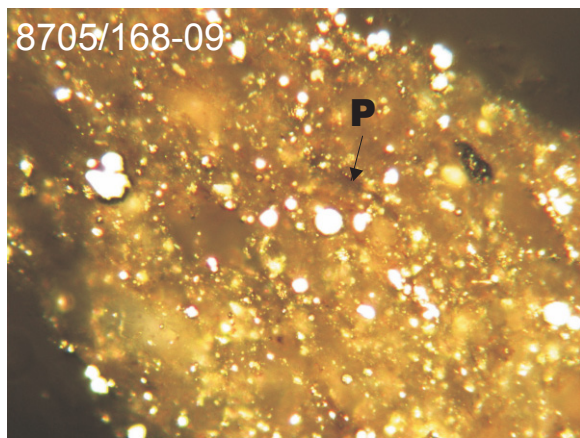




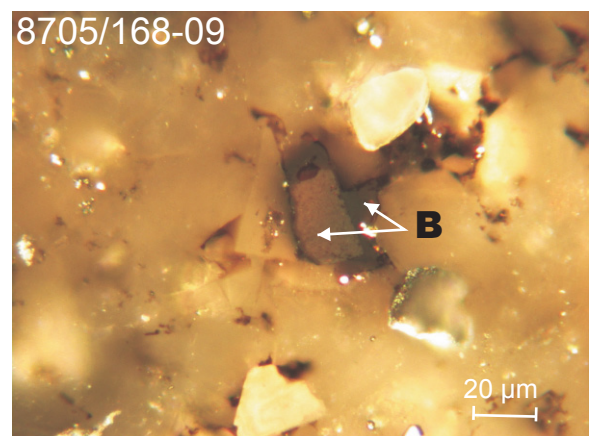
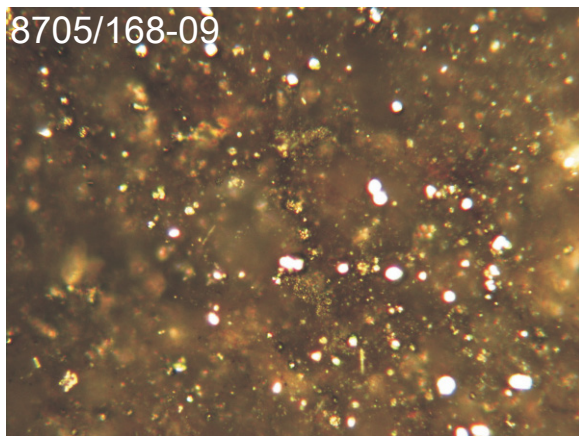
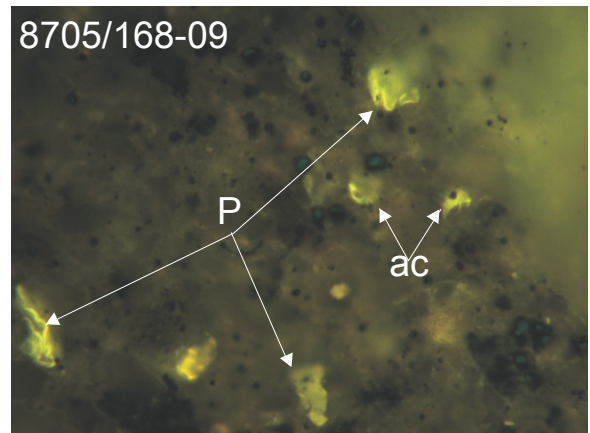
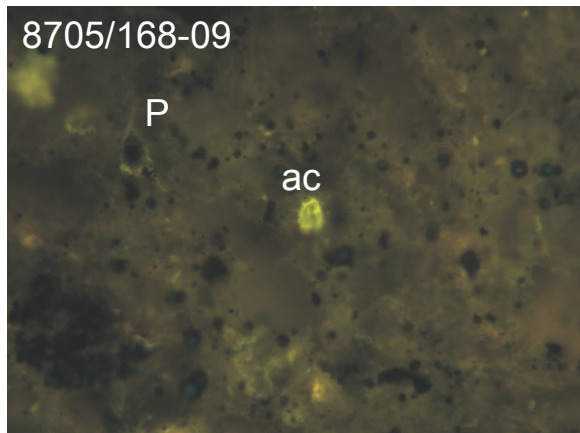
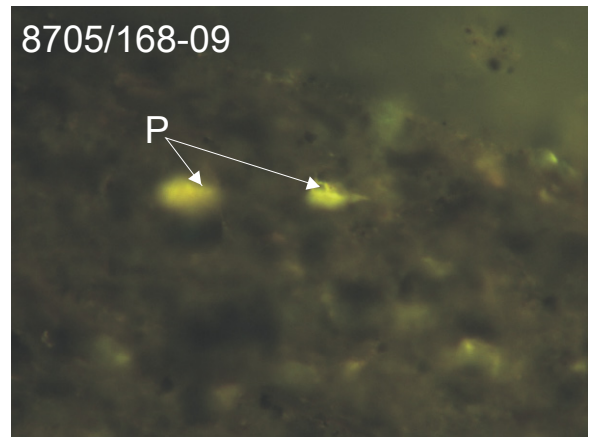
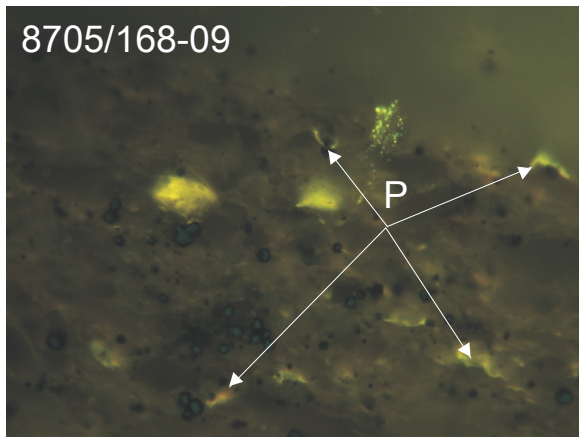


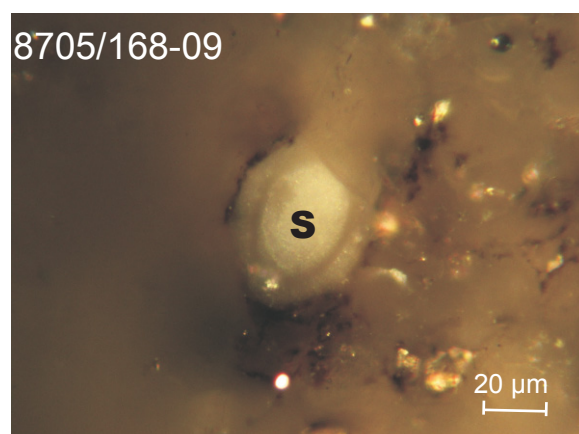
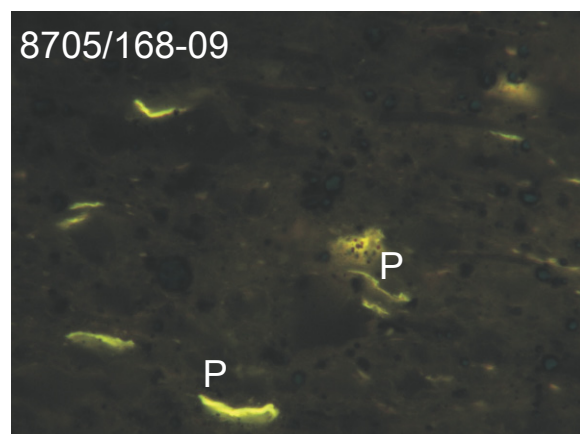
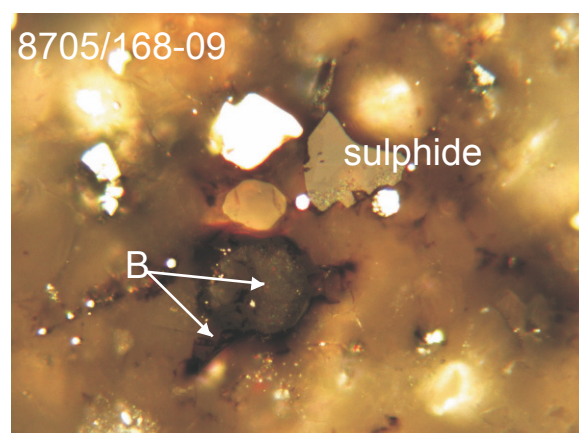
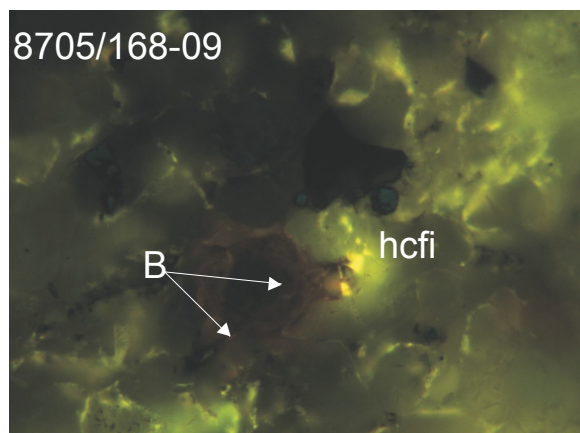
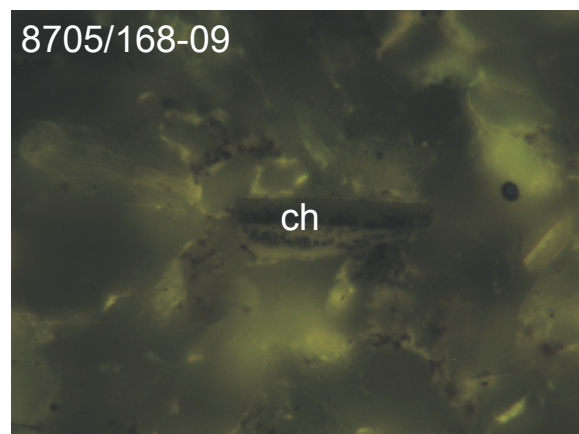
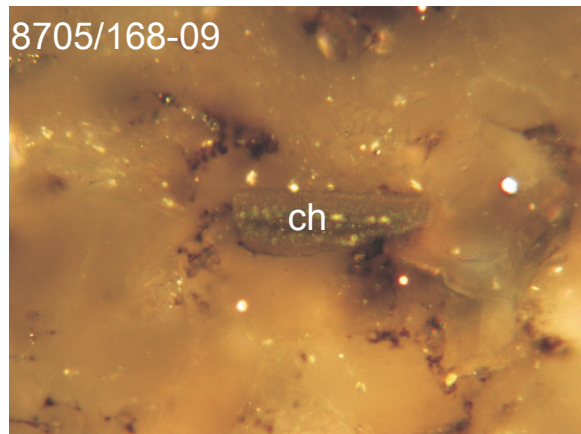


AGS 8705/GSC 168-09 (Montney; 100/11-27-077-06W6/00, 1741.2 m core depth). Mixture of very fine grained, silty shale to very coarse grained siltstone. Major amount of Prasinophyte (P) alginite and a rare amount of spiny acanthomorphic acritarchs (ac) mainly observed in the framboidal pyrite-rich silty shale matrix. Primary and secondary bitumen (B) are also seen within the intergranular pores of the very fine siltstone matrix with traces of yellow- to orange-fluorescing asphaltine annealed between carbonate grains. The bitumen lenses most likely originated from the stylocumulates between brecciated carbonates grains. Bright yellow-fluorescing hydrocarbon fluid inclusions (hcfi) within the mineral matrix of both silt and shale. There are also trace amounts of chitinous (ch, probably derived from chitinozoans) and siliceous (S, probably derived from radiolaria) microfossils. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

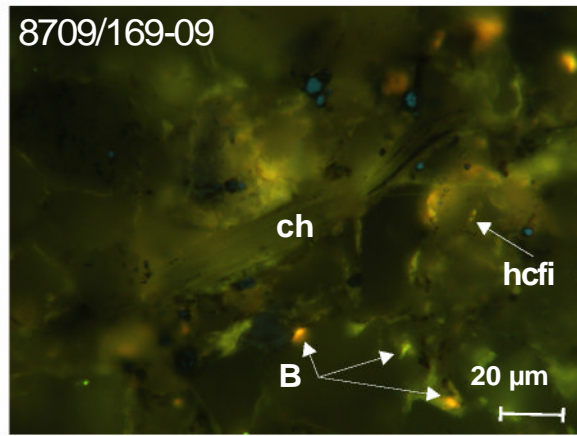
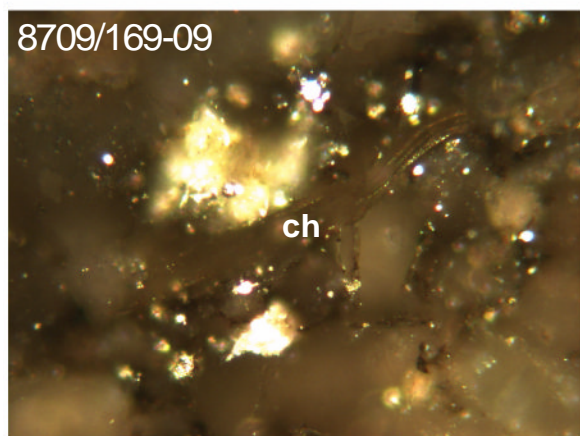
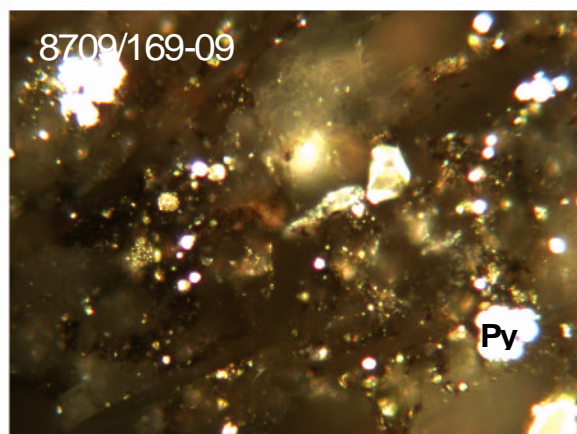
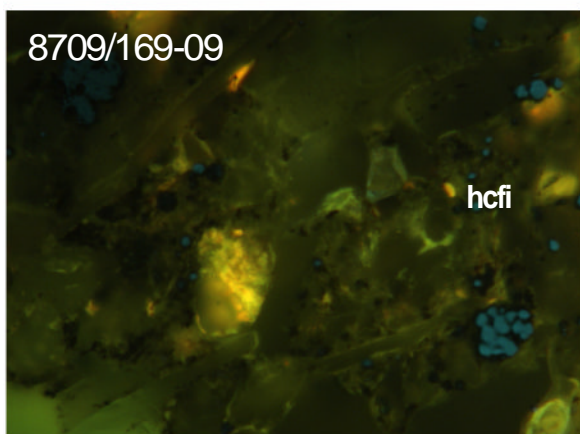
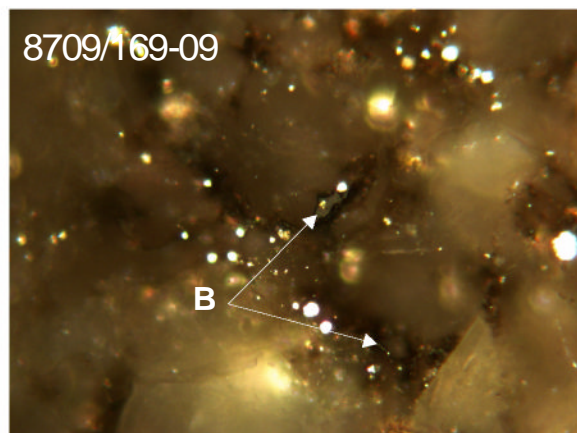
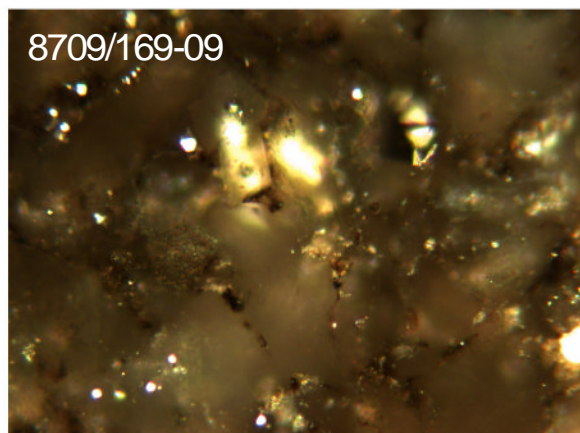




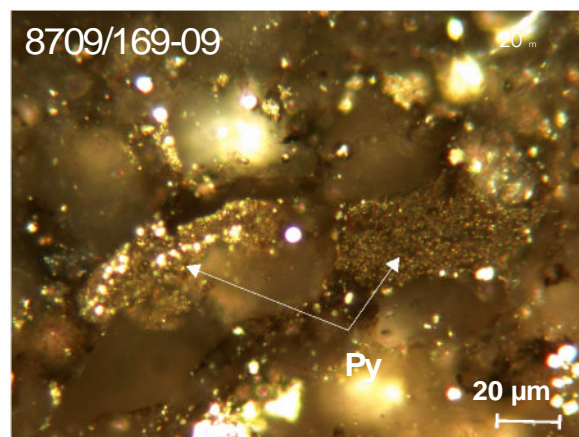
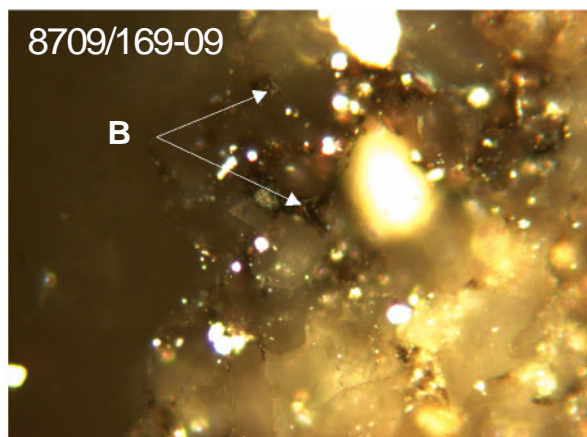




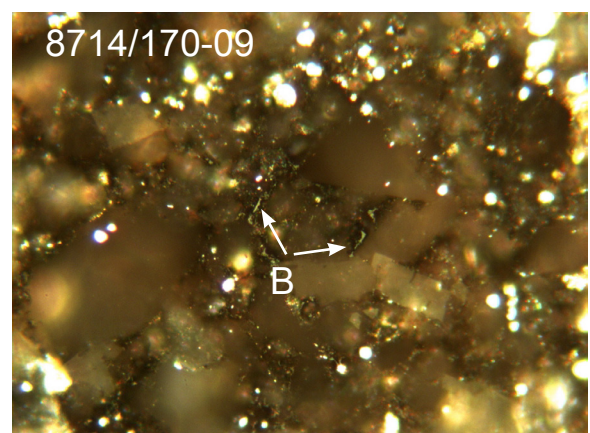
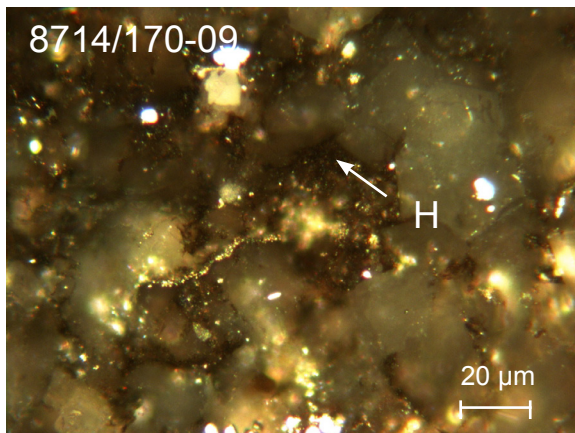
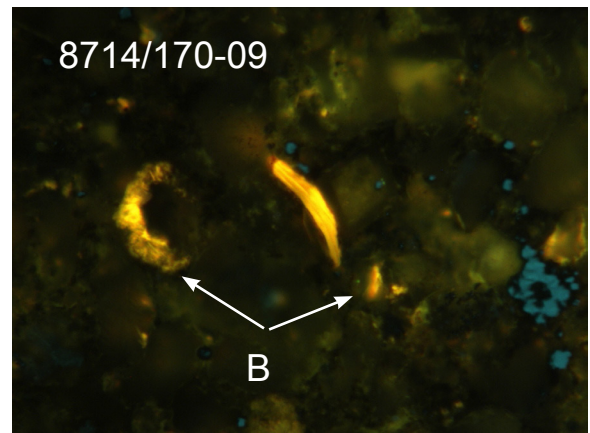
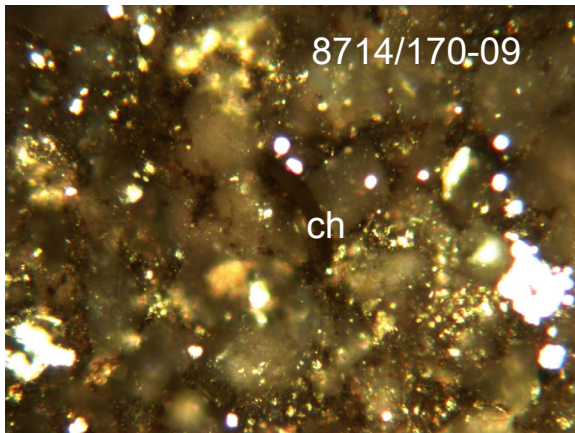
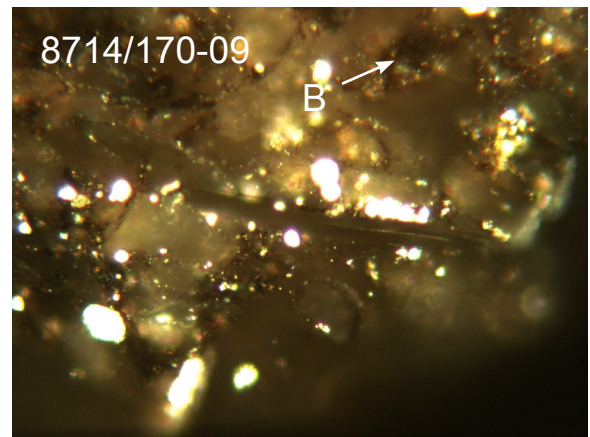
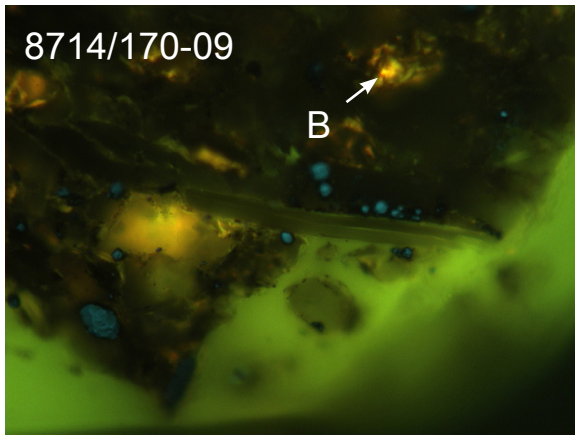




AGS 8709/GSC 169-09 (Montney; 100/05-14-078-11W6/00, 2189.9 m core depth). Organically lean, coarse-grained, silty shale with mostly pyrite-rich (Py), stylomaculates and spent amorphous kerogen within the intergranular pores of a brecciated carbonate matrix. Very few measureable vitrinite lenses; mostly small isotropic bitumen lenses (B). Trace amount of chitinous microfossils (ch) probably derived from crustacean appendages. hcfi = hydrocarbon fluid inclusion. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

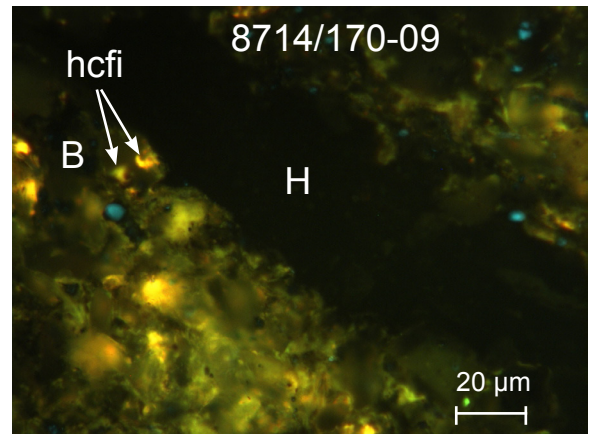
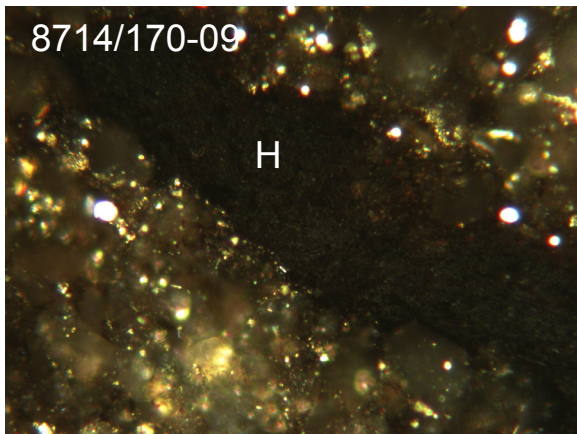
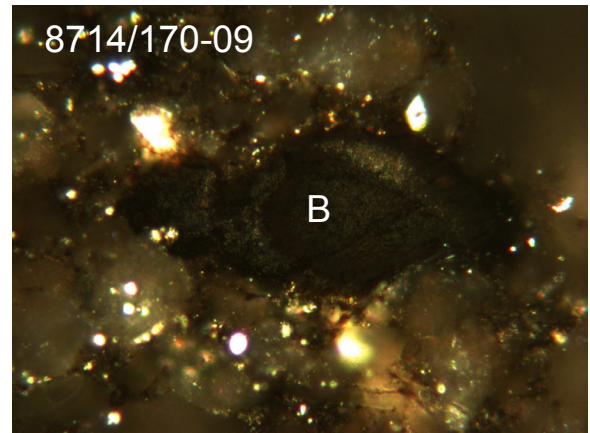
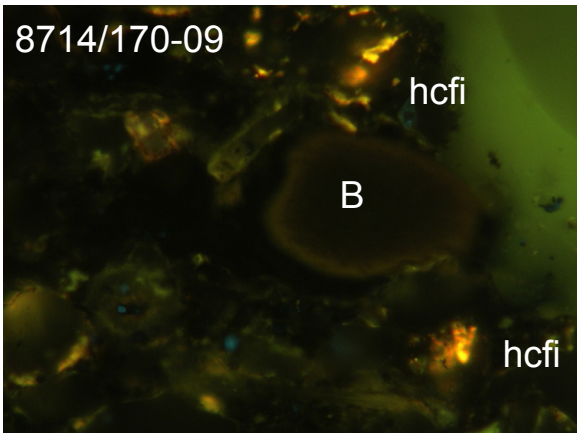
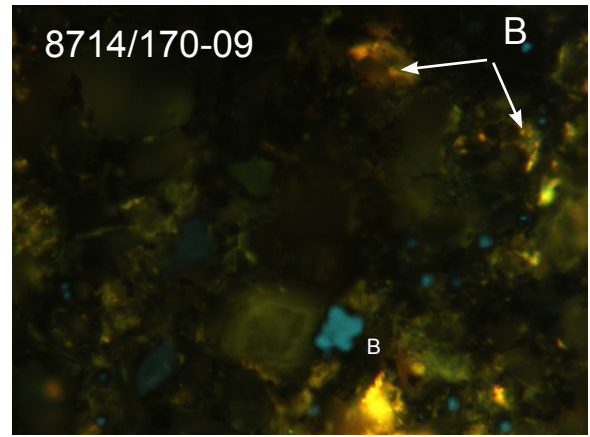
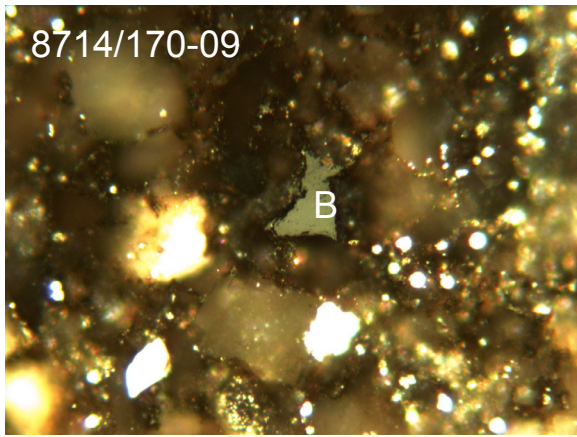


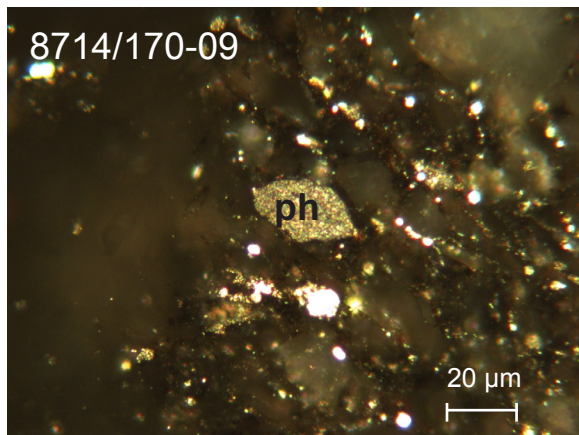




AGS 8714/GSC 170-09 (Montney, 100/05-14-078-11W6/00, 2220.9 m core depth) Coarse grained, silty shale with mostly pyrite-rich (Py), stylocumulates and spent amorphous kerogen within the intergranular pores of a brecciated carbonate matrix. Minor to rare amount of orange fluorescing bitumen (ashpaltine-like texture) and non-fluorescing bitumen (B) within intergranular pores, and yellow orange fluorescing hydrocarbon fluid inclusions (hcfi) within calcite and quartz grains. Trace amount of granular, non-fluorescing hebamorphinite (H) within a pyrite-rich, coarse grained, silty shale matrix and spent phosphatic nodules (ph). Very few measureable vitrinite lenses. ch = chitinous microfossil. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

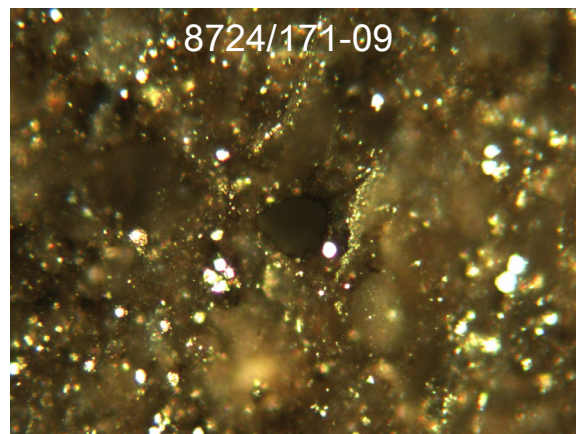
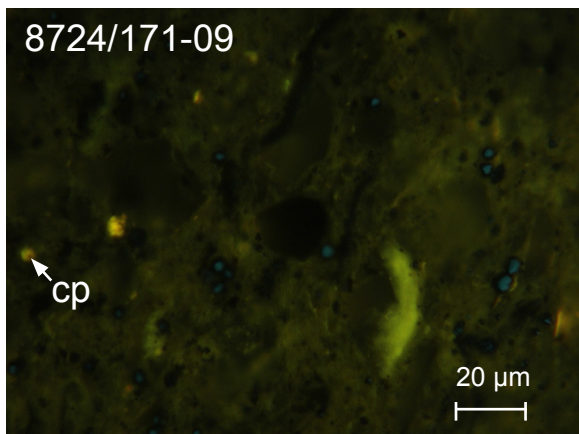
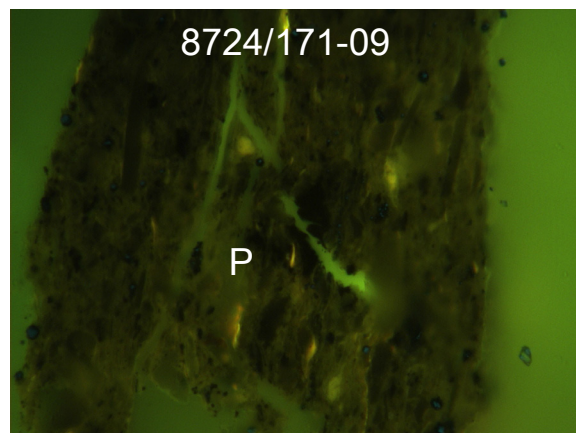
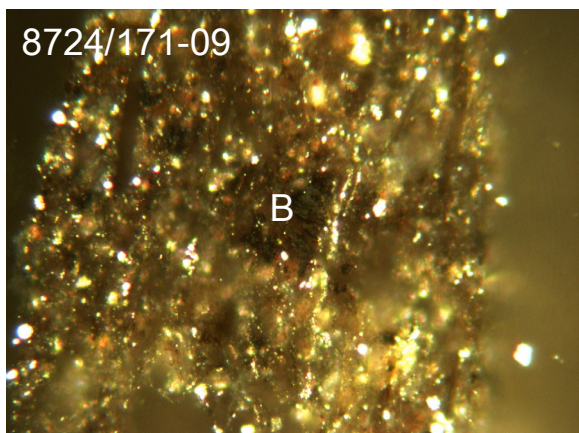
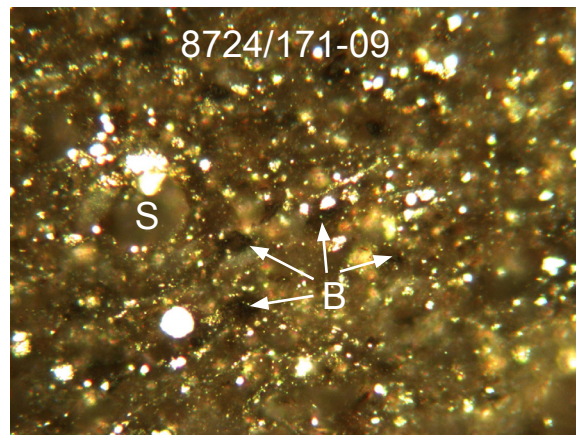
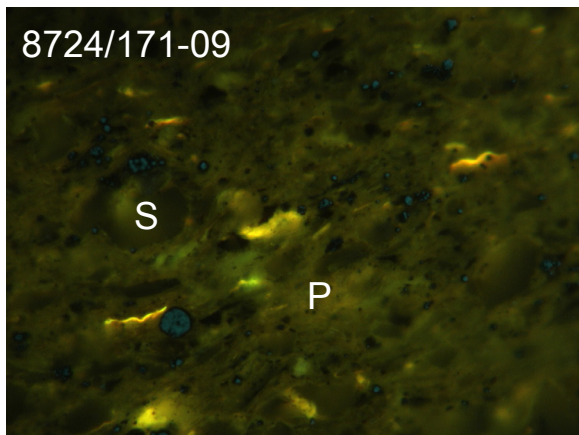






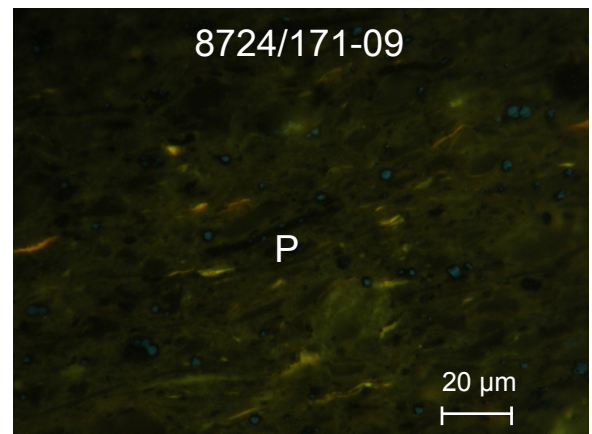
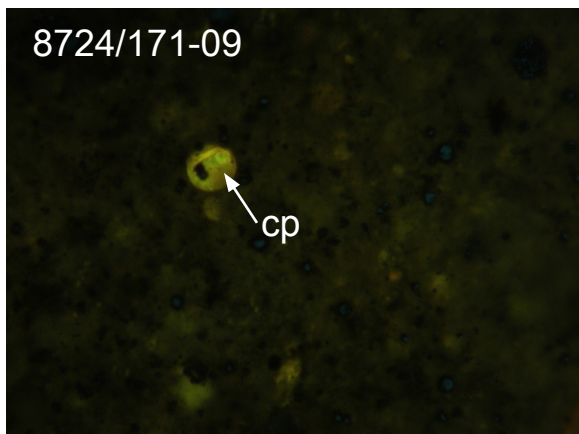
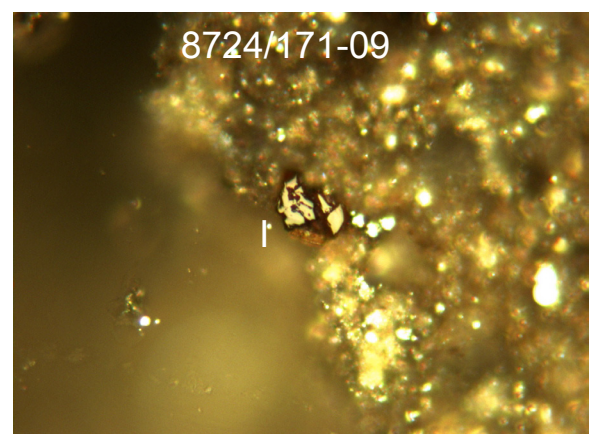
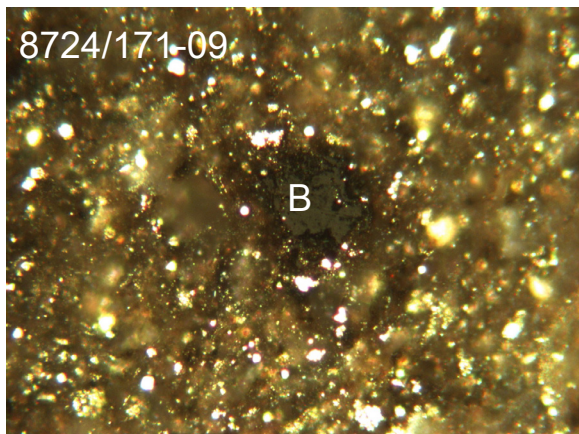
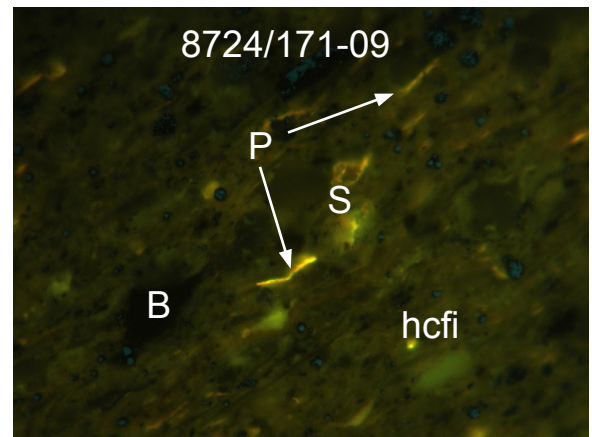
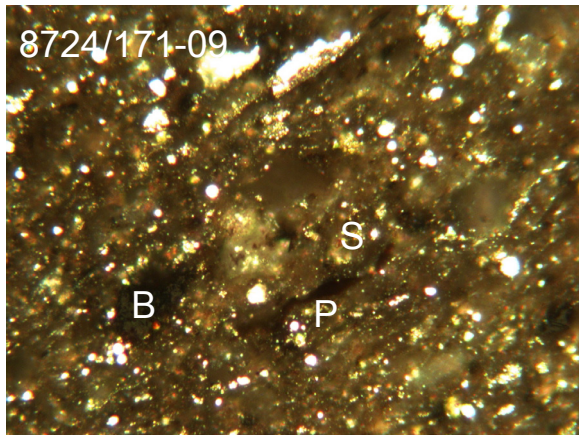
170-09 (3 of 3). Coarse grain silty shale with mostly pyrite rich stylocumulates and spent amorphous kero-  
 gen within the intergranular pores of brecciated carbonates matrix. Minor to rare amount of orange  
 fluorescing bitumen (ashpaltine like texture) and non fluorescing bitumen (B) within intergranular  
 pores, and yellow orange fluorescing hcfi annealed within calcite and quartz grains. Trace amount of  
 granular non fluorescing hebamorphinite (H) within pyrite rich coarse grain silty shale matrix and  
 spent phosphatic nodules (P). Very few measureable vitrinite lenses. In oil, polished surface, fluo-

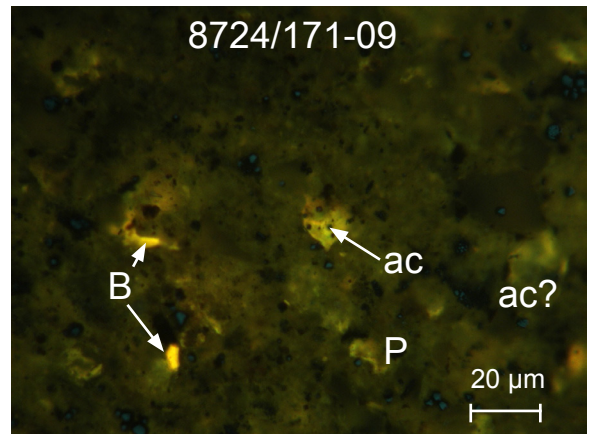
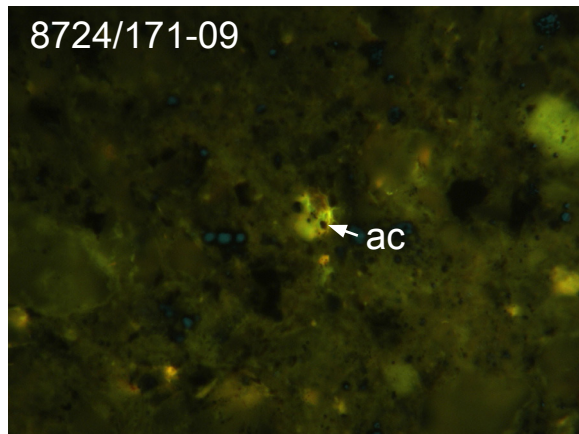
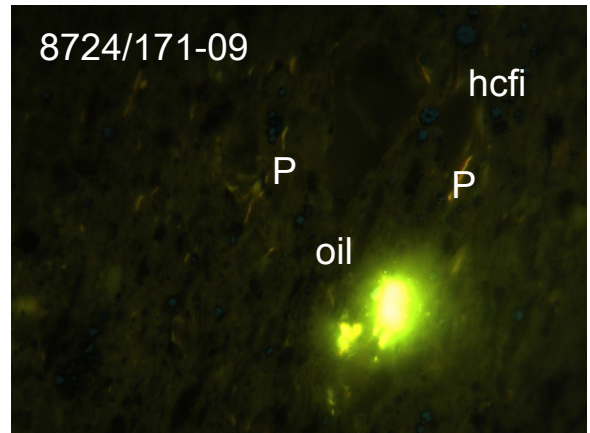
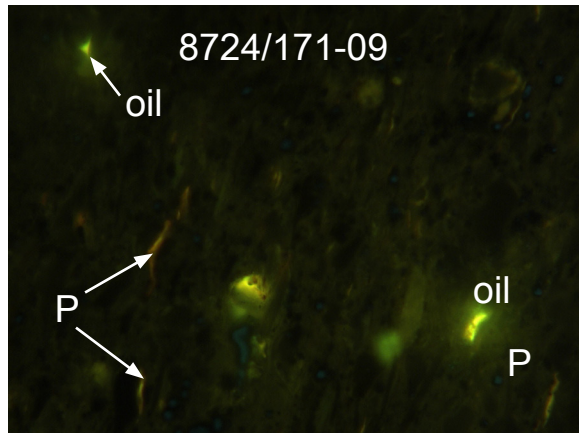
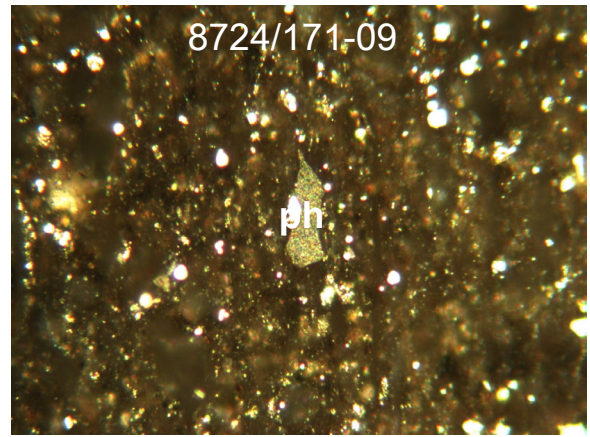
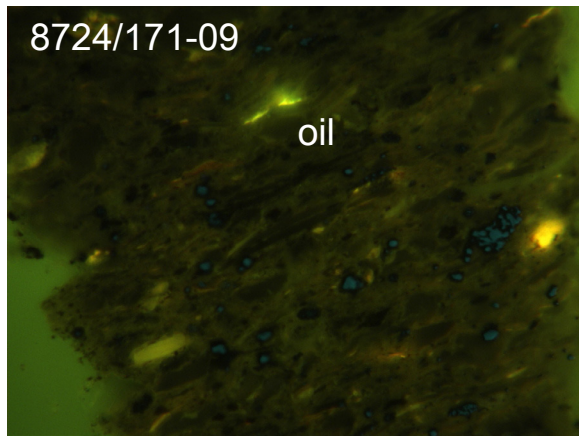




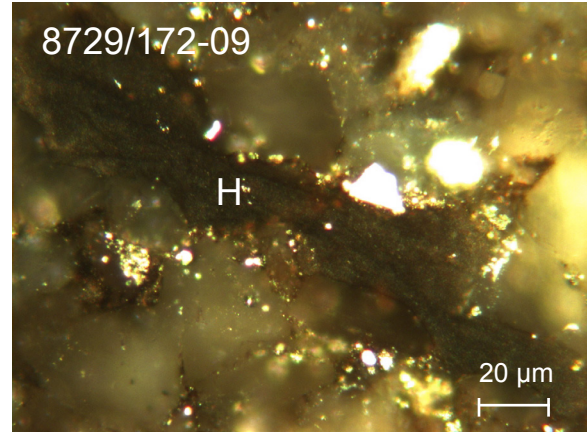
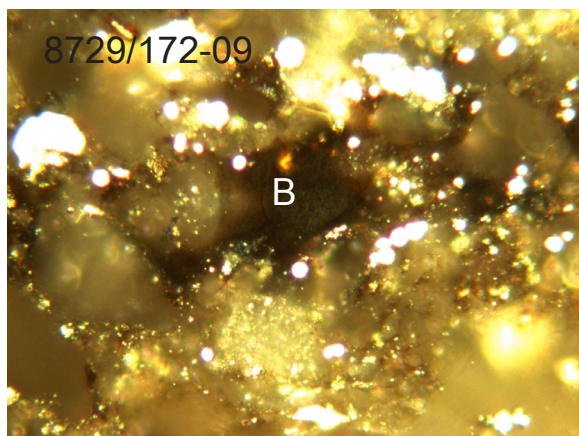
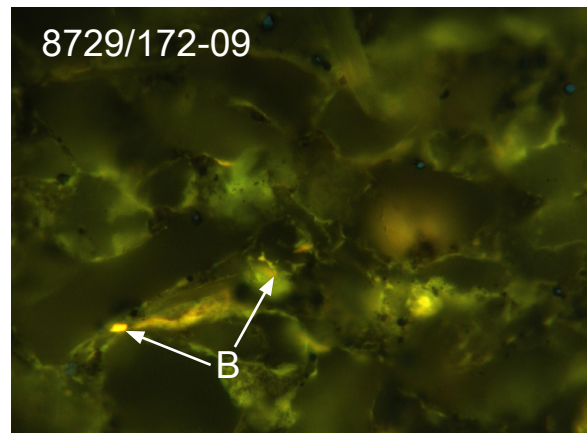
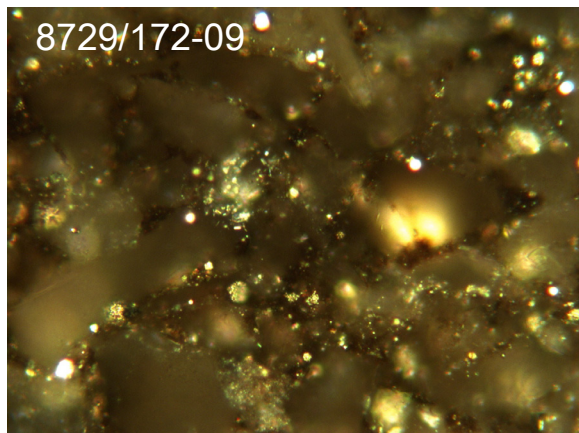
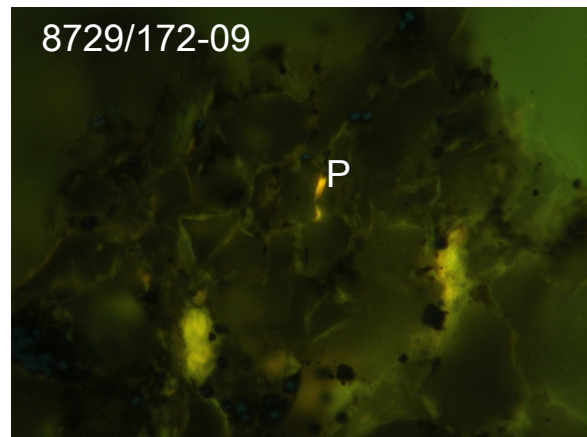
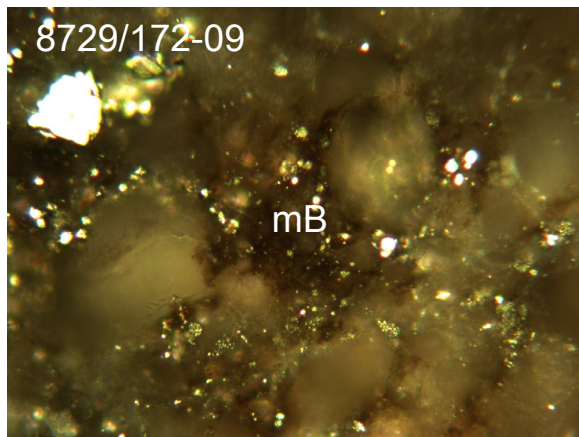
AGS 8724/GSC 171-09 (Montney, 100/06-36-071-04W6/00, 1922.6 m core depth). Brown, silty shale with a major amount of Prasinophyte (P) alginite widely disperse within pyrite-rich (Py), amorphous kerogen (am). Minor to rare amount of bright, yellow fluorescing soluble oil/asphaltine causing partial saturation in some matrix. Rare yellow fluorescing spiny acanthomorphic acritarch (ac) (sp, 2 to 3 species) and chrysophytes (cp) cyst. Rare, orange fluorescing bitumen and non-fluorescing bitumen (B) within intergranular pores and yellow orange fluorescing hydrocarbon fluid inclusions (hcfi) annealed within calcite and quartz grains and granular pyrite-rich, phosphatic nodules (ph). Very rare, allochthonous inertinite (I) maceral. S = siliceous microfossil. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).





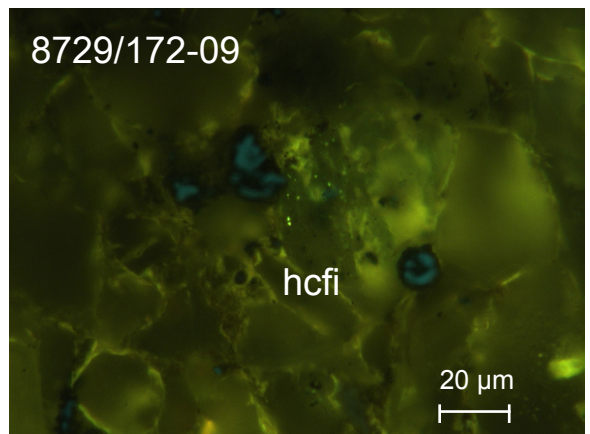
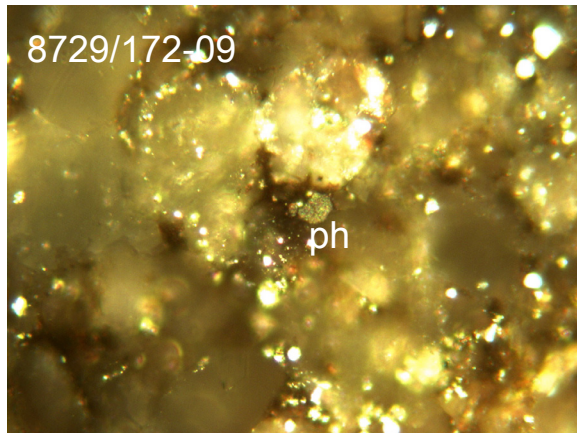
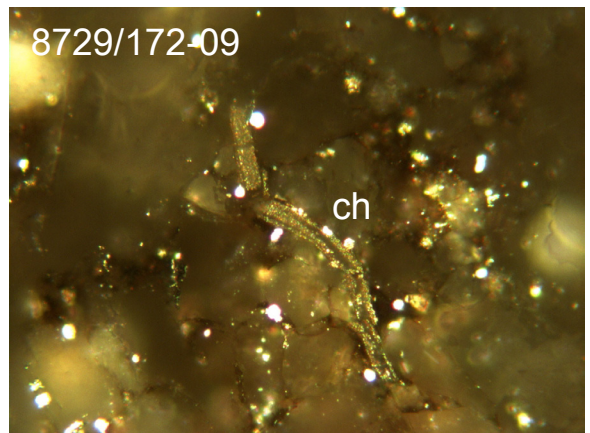
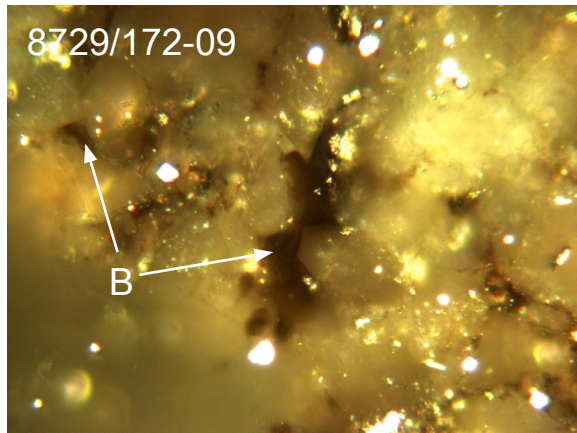
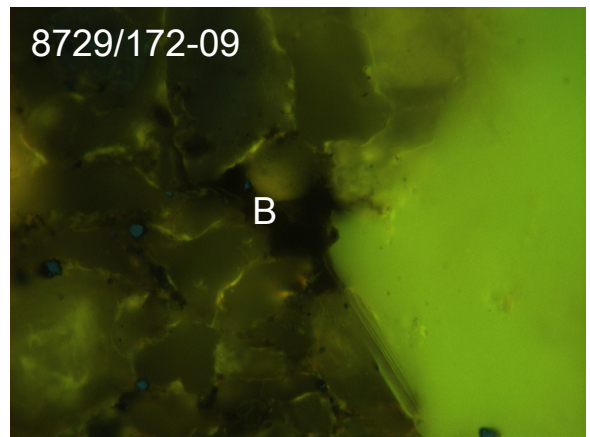
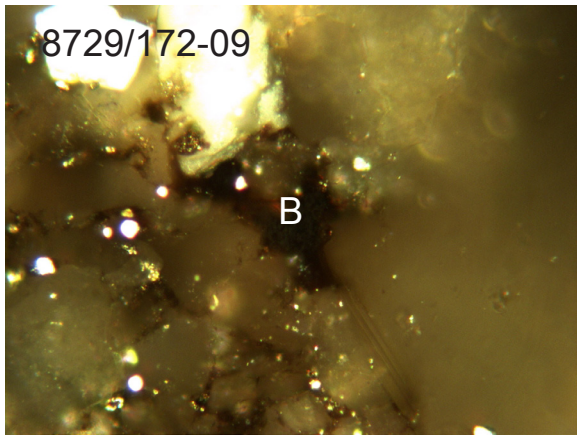


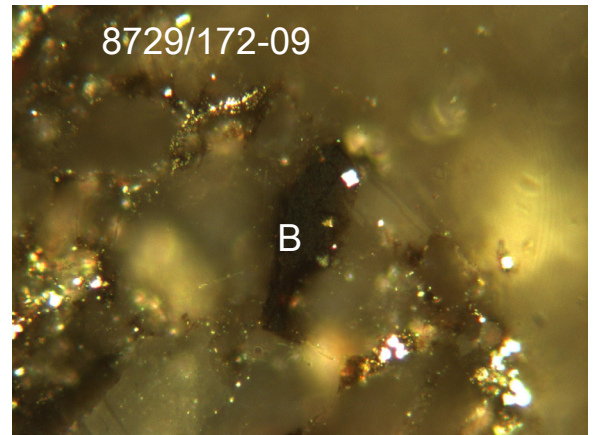
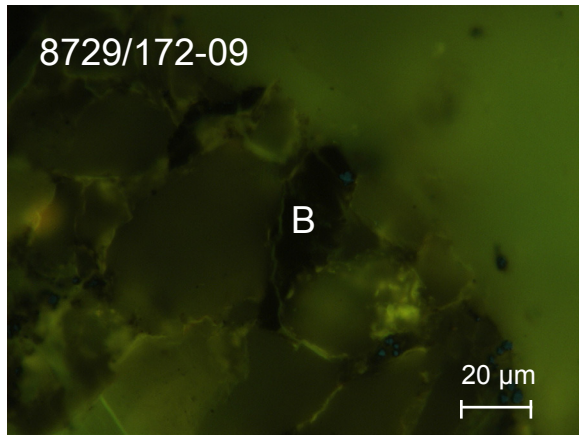




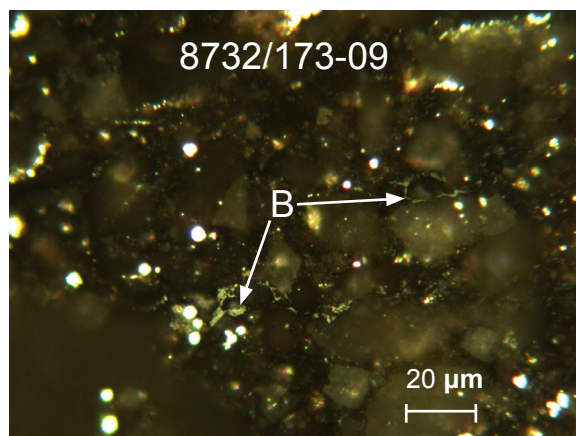
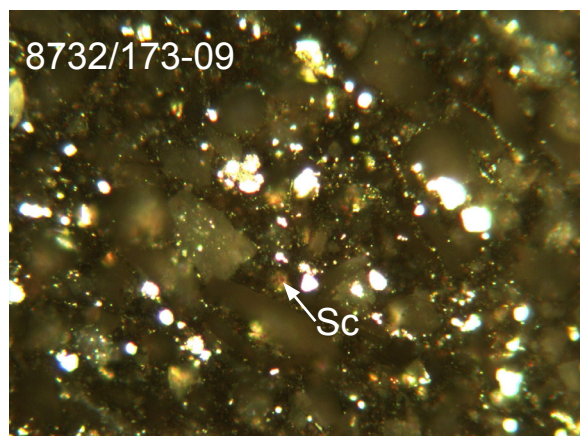
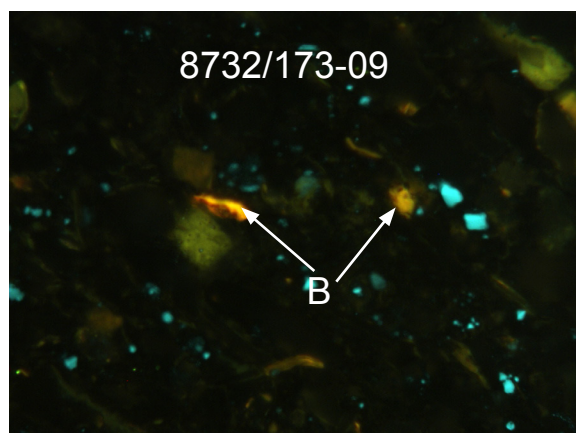
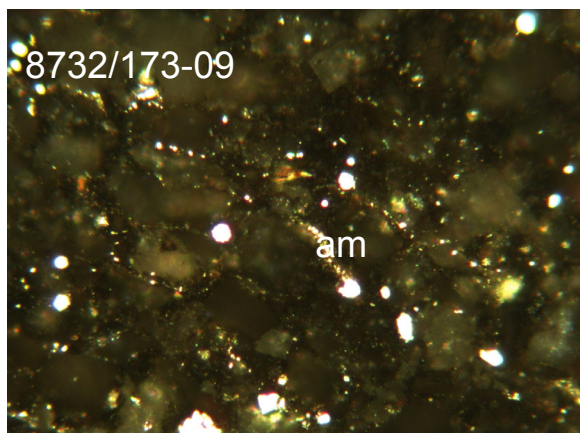
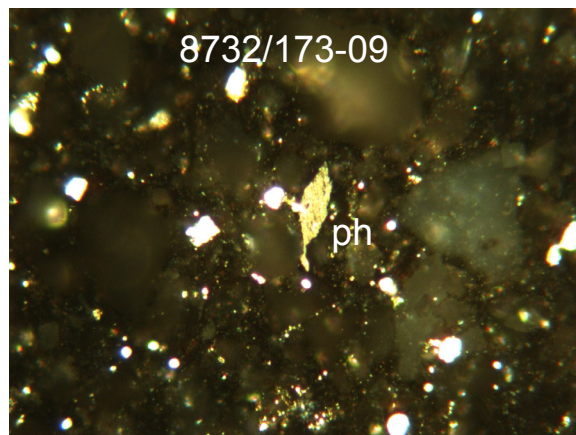
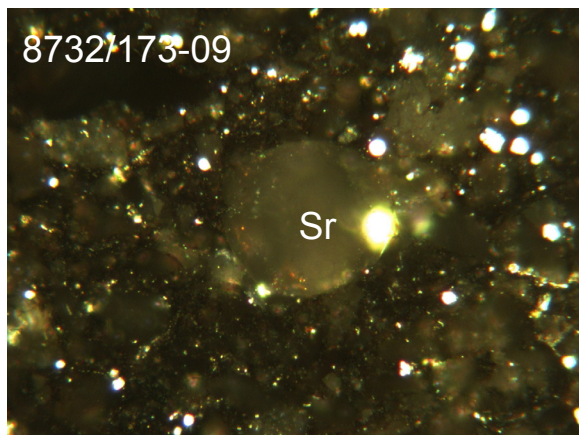
AGS 9720/GSC 172-09 (Montney, 100/06-36-071-04W6/00, 1943.0 m core depth). Coarse-grained, silty shale with mostly pyrite-rich (Py) stylocumulates and spent amorphous kerogen within the intergranular pores of a carbonate-dominated matrix. Minor amount of non-fluorescing bitumen (B) within intergranular pores, and a rare amount of orange fluorescing bitumen (asphaltine-like texture) and yellow orange fluorescing hydrocarbon fluid inclusions (hcfi) within calcite and quartz grains. Trace amount of granular, non-fluorescing hebamorphinite (H)/matrix bituminite (mB). P = Prasinophyte, ch – chitinous microfossil, ph = phosphatic nodule. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X) magnification).



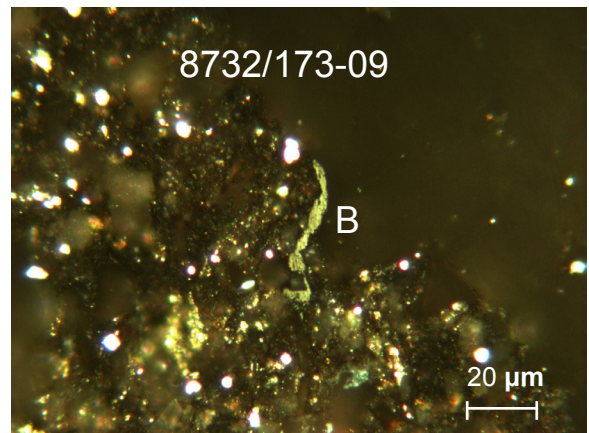
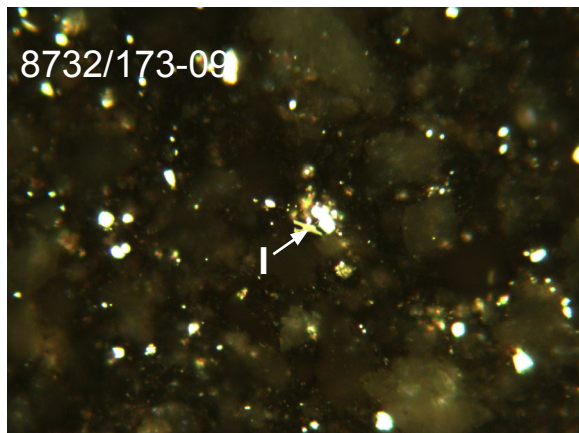
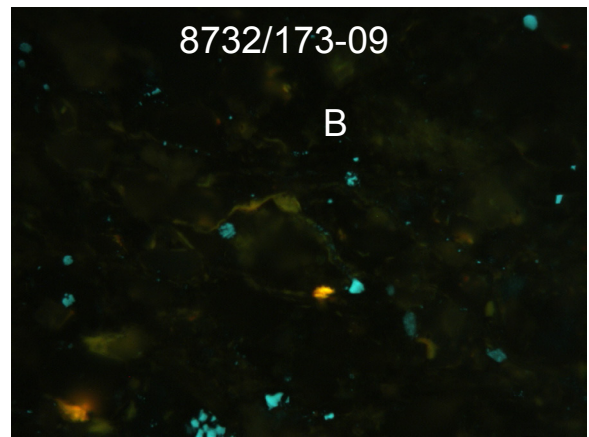
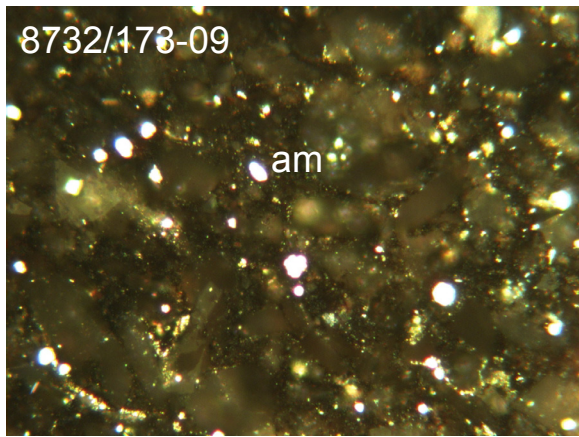




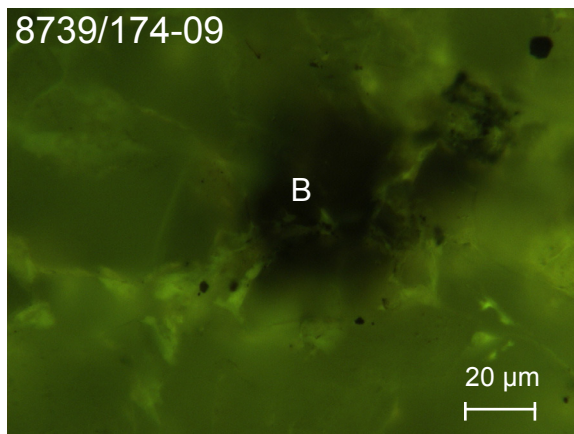
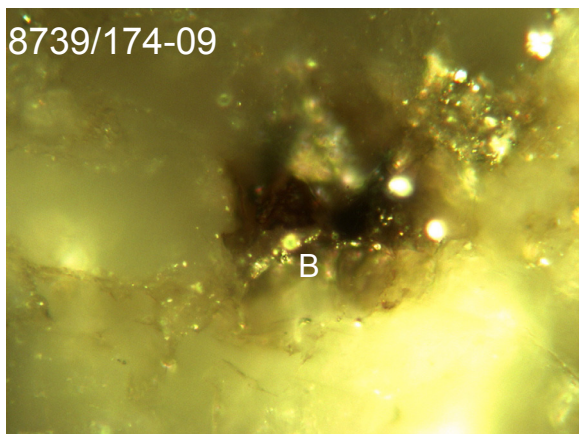
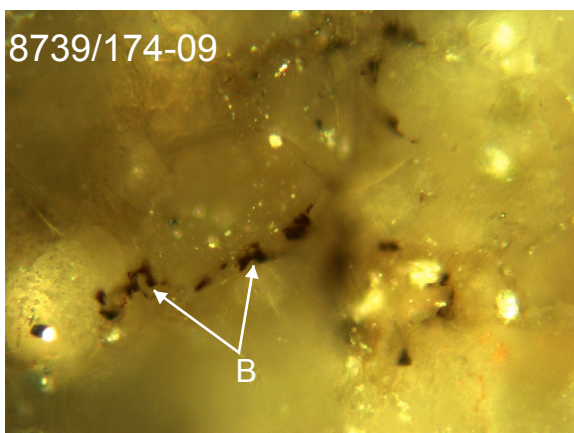
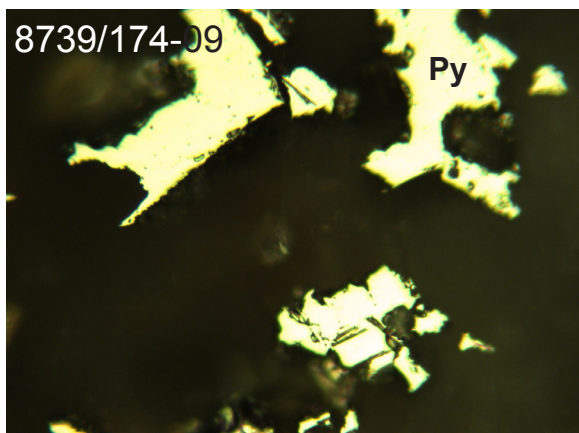
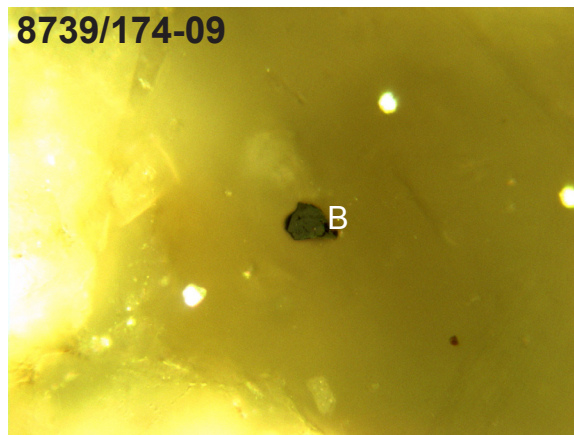
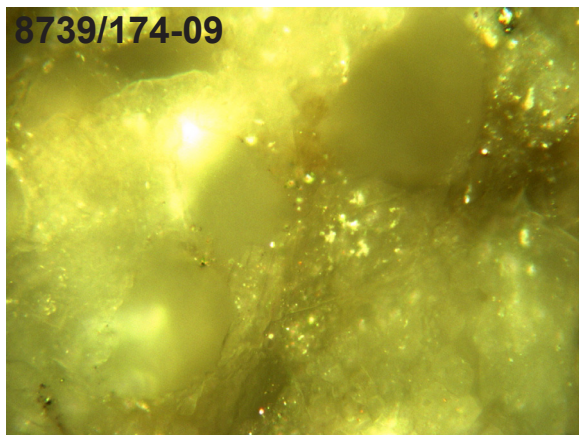




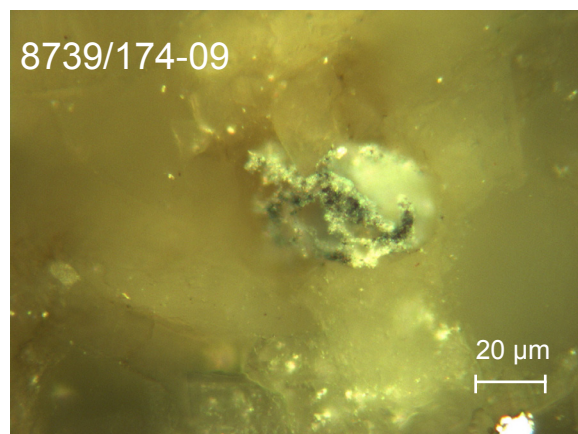
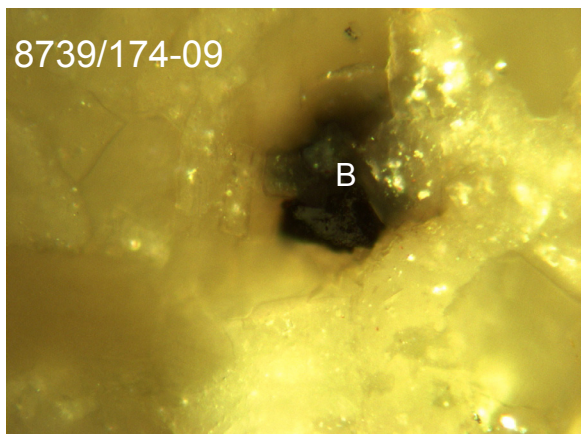
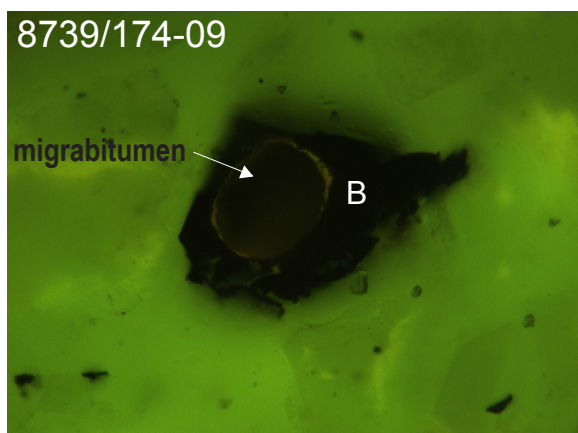
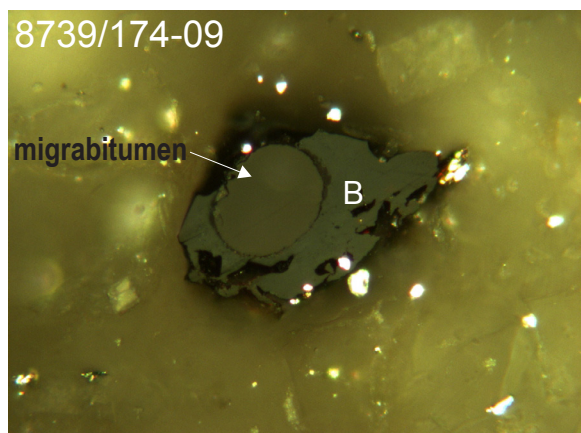
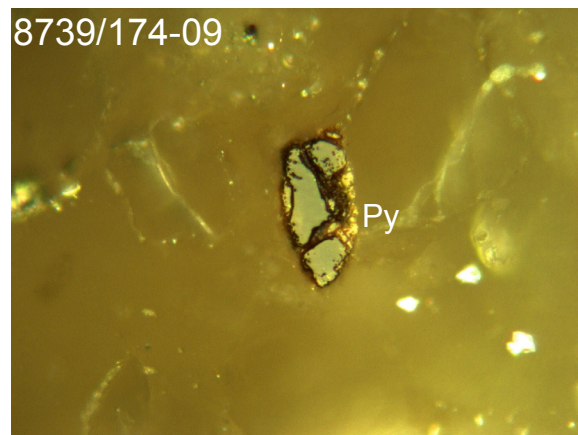
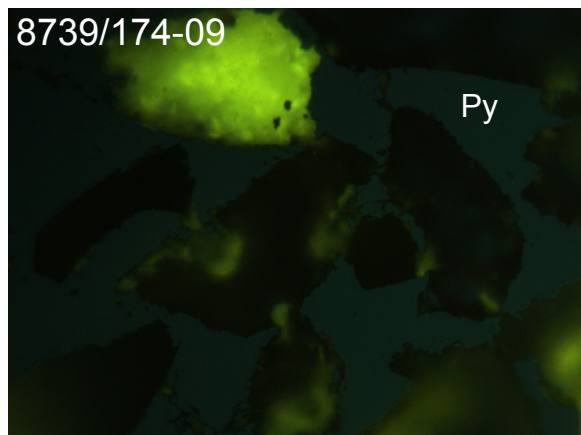
AGS 8732/GSC 173-09 (Montney, 100/05-32-073-12W6/00, 2817.9 m core depth). Organically-rich, dark brown, silty shale with mostly pyrite-rich, spent amorphous kerogen (am) within intergranular pores of a carbonates matrix. A rare amount of yellow orange fluorescing bitumen (asphaltine-like texture) is present and non-fluorescing, mainly granular bitumen (B) within intergranular pores. A very rare amount of siliceous microfossils are present, probably derived from radiolaria (Sr) and chrysophytes (Sc) cyst. Allochthonous inertinite (I) are also observed. Ph = phosphatic nodules. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).



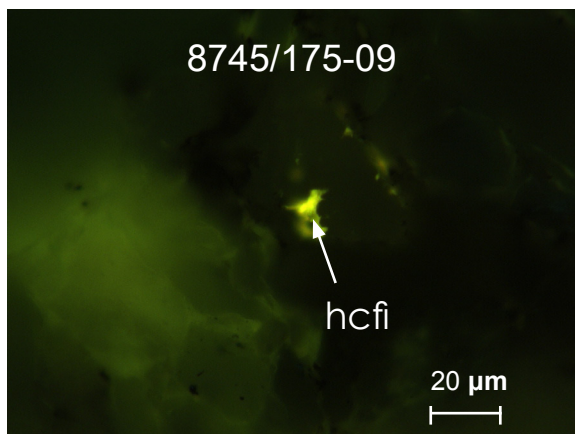
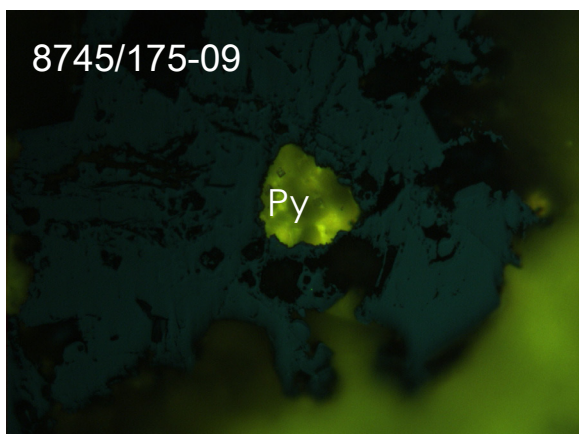
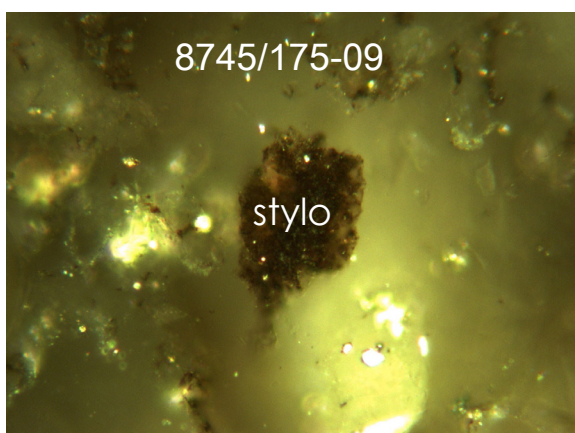
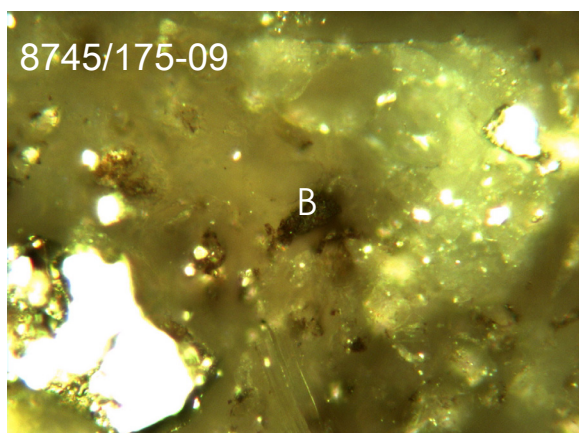
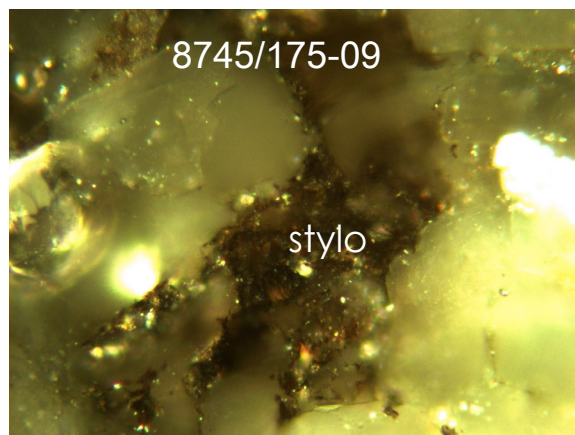
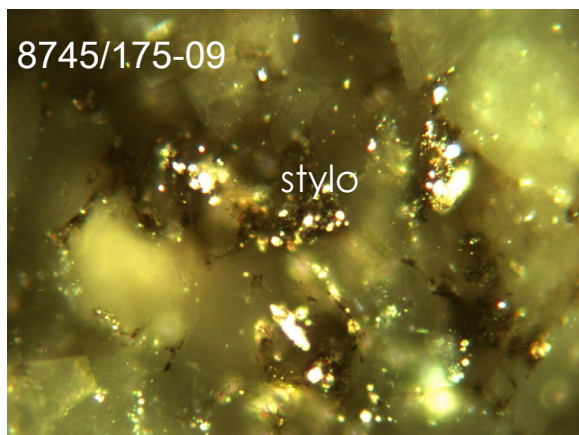




AGS 8739/GSC 174-09 (Montney; 103/10-34-064-19W5/00, 1776.2 m core depth). Pyrite-rich (Py) siltstone with a very fine grained sandstone matrix and a very rare amount of isotropic solid, granular, orange-fluorescing migrabitumen. Pore-filling dolomite is also observed. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). B = Bitumen

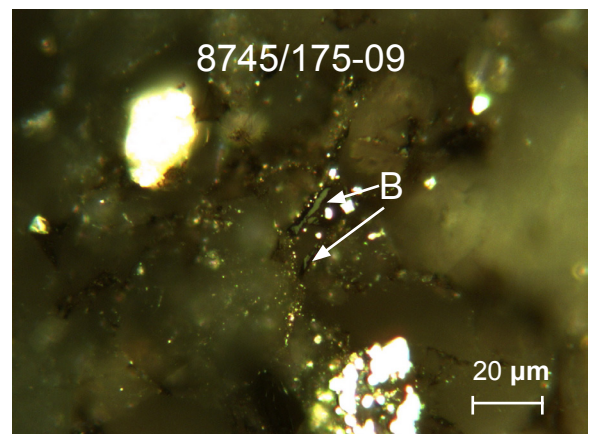
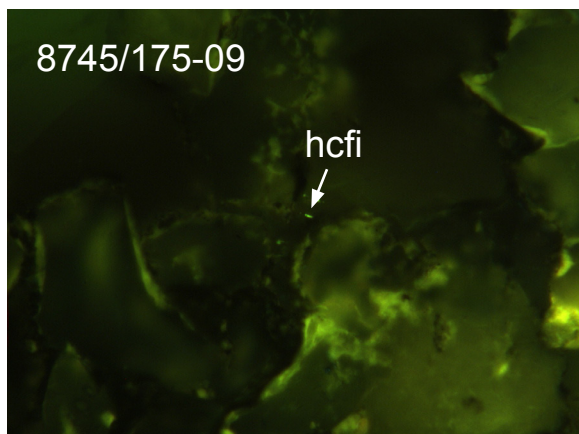
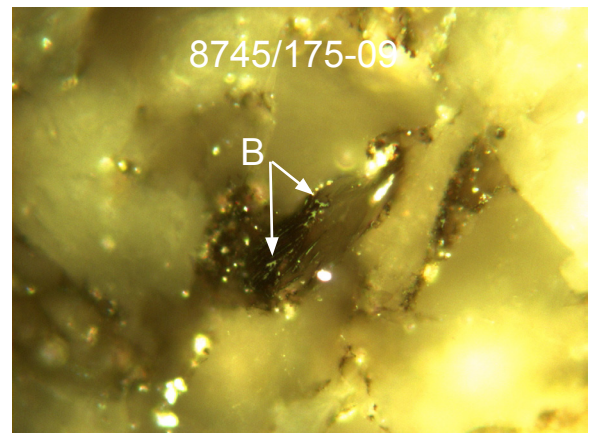
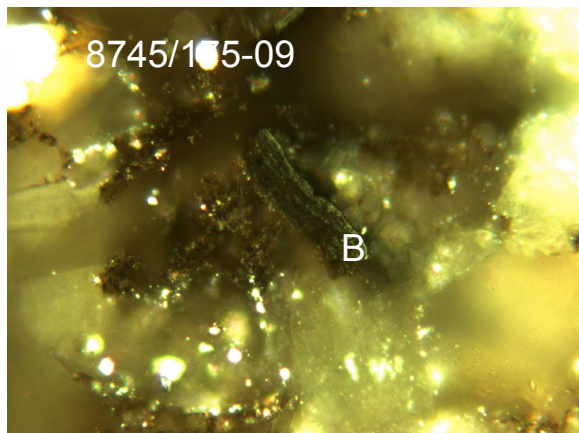
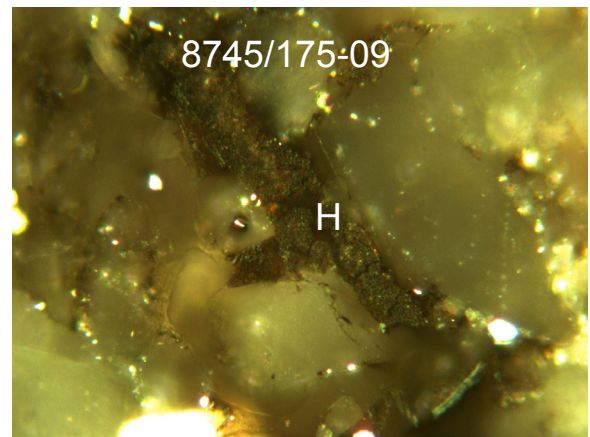
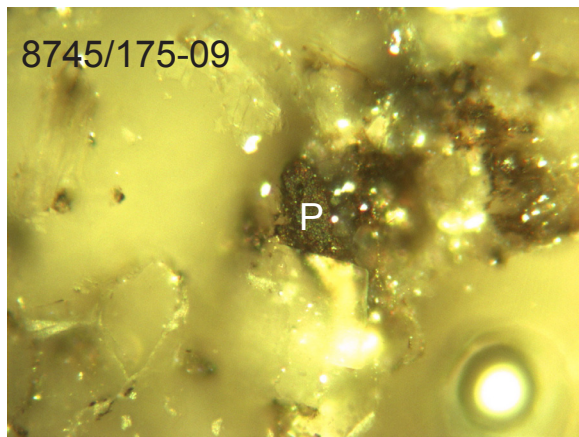




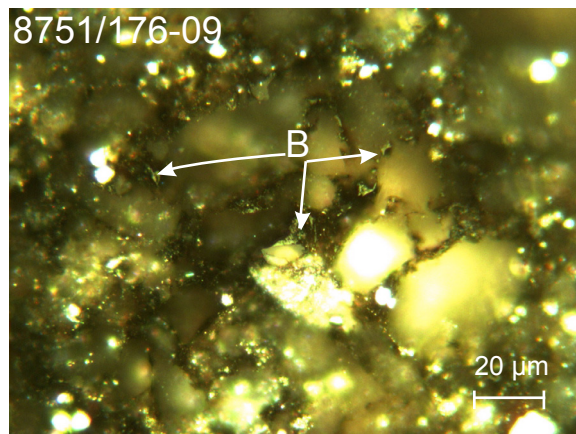
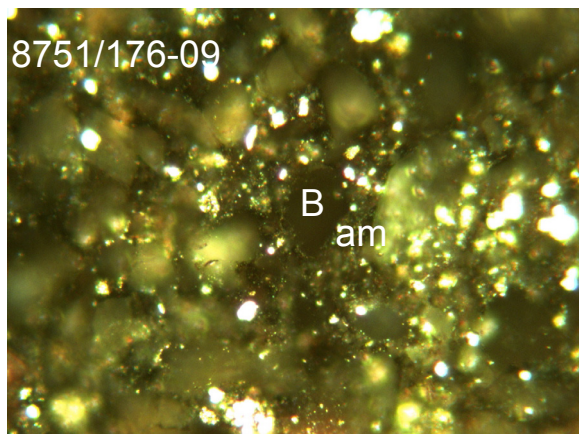
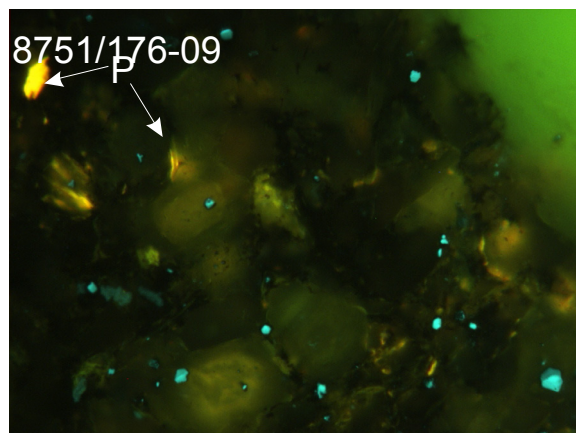
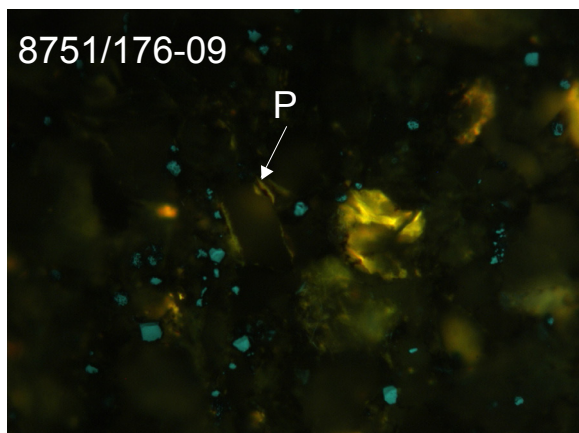
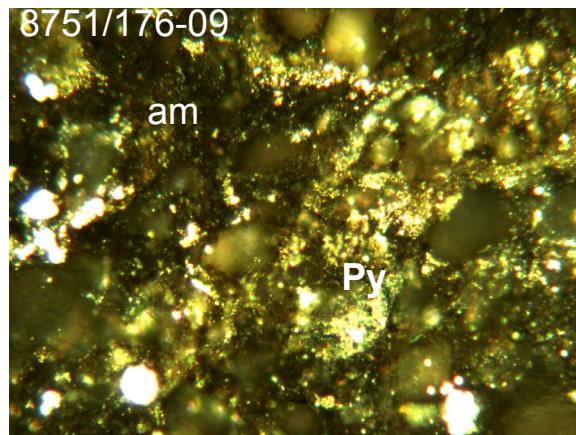
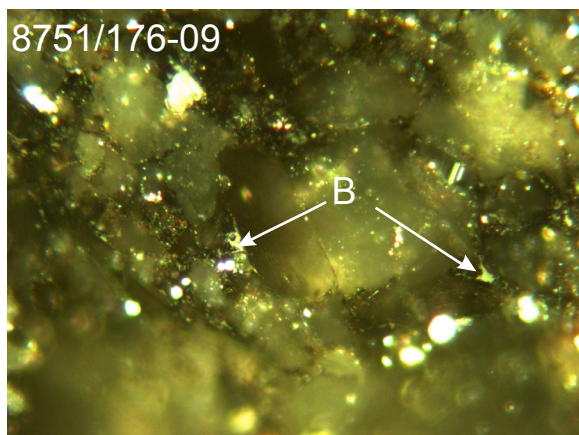


AGS 8745/GSC 175-09 (Montney, 102/11-34-061-19W5/00, 2166.3m core depth). Coarse-grained silty shale with mostly pyrite-rich (Py) stylocumulates (stylo) within the intergranular pores of a carbonate-dominated matrix. A minor amount of non-fluorescing isotropic and granular bitumen (B) is present within intergranular pores and mineral fractures, and a rare amount of orange fluorescing bitumen (asphaltine-like texture) and yellow-orange fluorescing hydrocarbon fluid inclusions (hcfi) within calcite and quartz grains. Trace amount of granular non-fluorescing hebamorphinite(H)/matrix bituminite. P = Prasinophyte. Scale bar applies to all images (In oil, polished surface, fluorescence and reflected white light, 50X magnification).



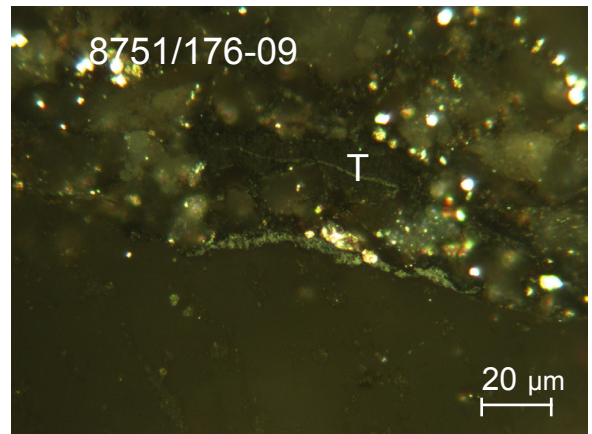
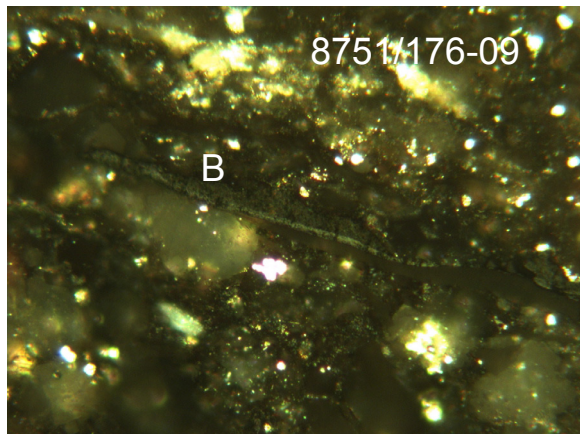
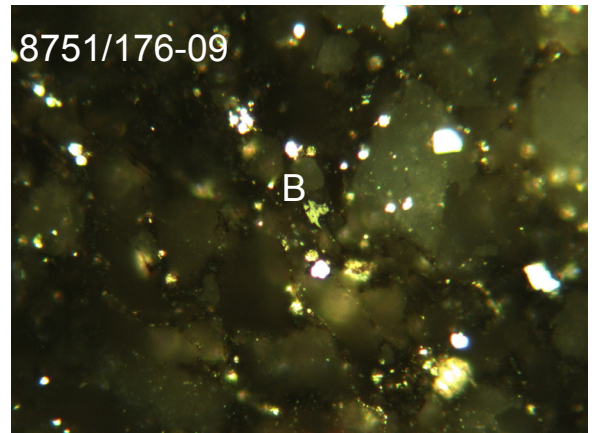
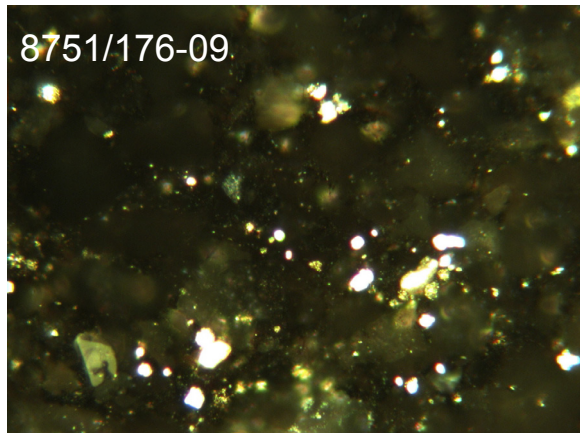
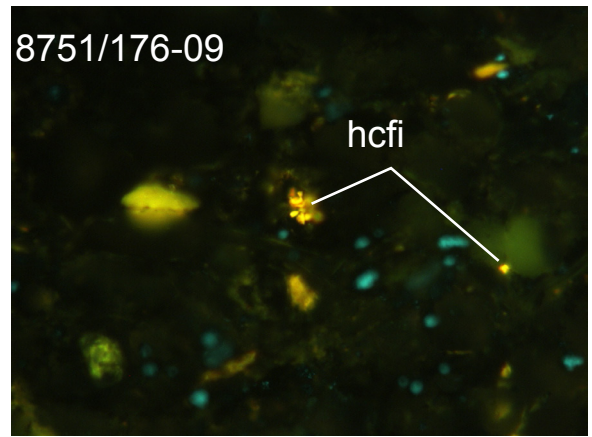
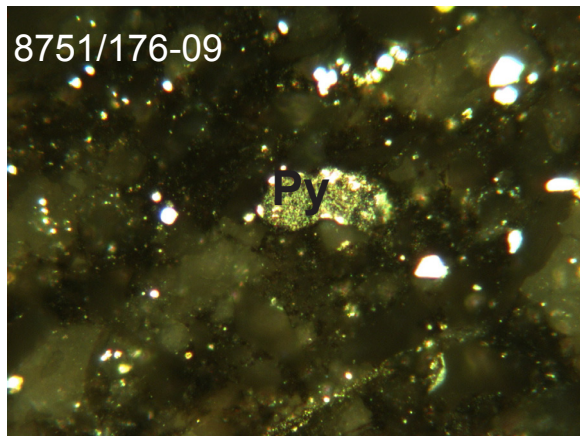




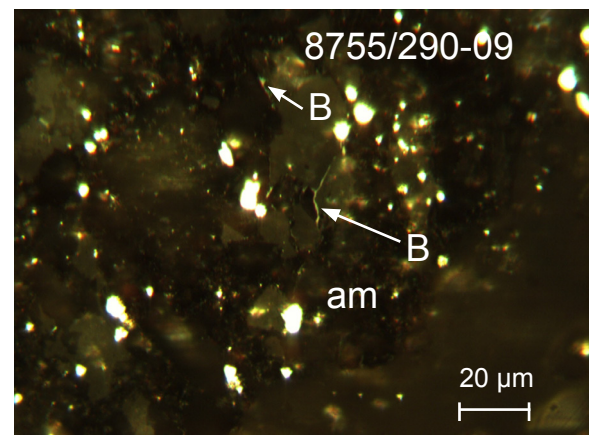
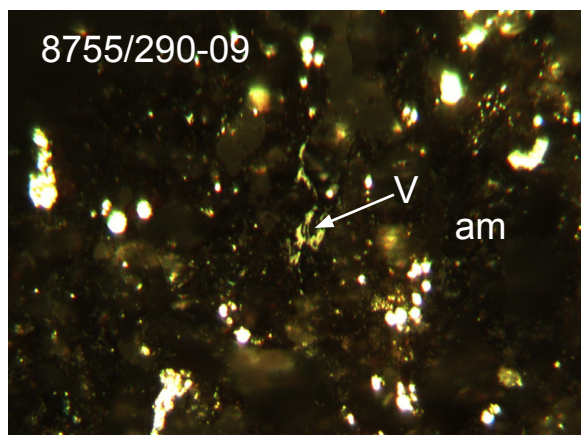
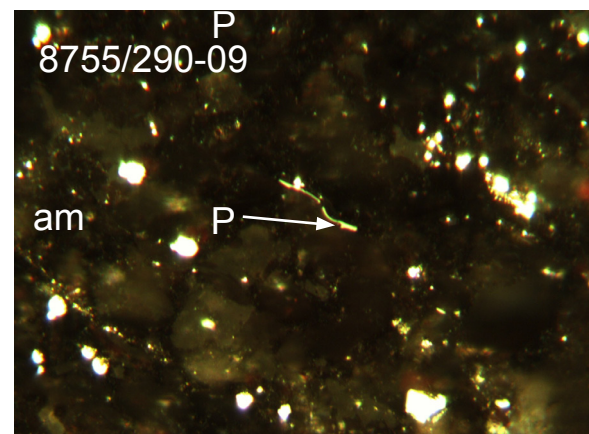
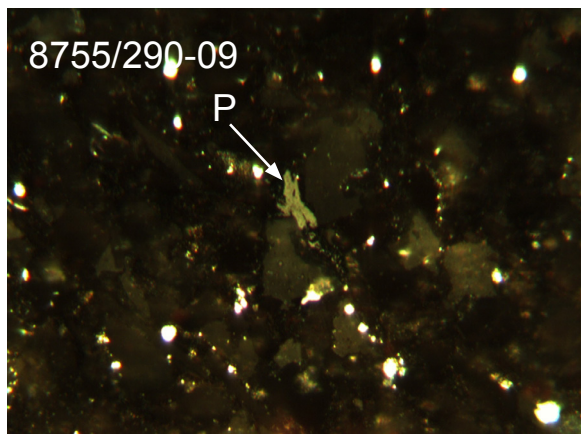
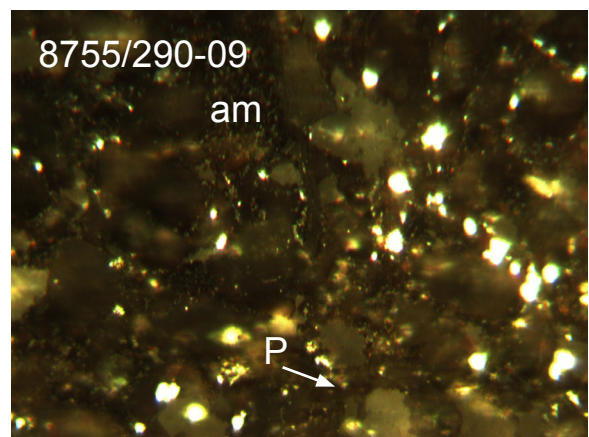
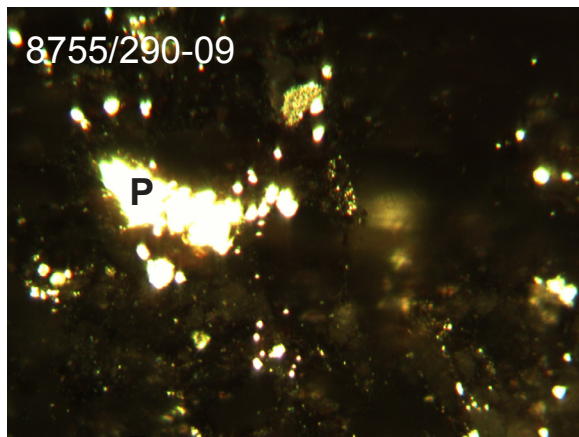


AGS 8751/GSC 176-09 (Montney; 100/07-05-067-07W6/00, 10,093 ft. core depth). Organically rich, dark brown, silty shale with mostly framboidal pyrite-rich (Py) amorphous kerogen (am) brecciated within the intergranular pores of a carbonate matrix. A minor amount of non-fluorescing, granular, thin lenses of pore-filling and fracture filling primary bitumen (B) is present within intergranular pores. A rare to trace amount of orange fluorescing Prasinophyte (P) alginite and non-fluorescing granular Tasmanites sp? (T) is also present. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). hcfi = hydrocarbon fluid inclusion.



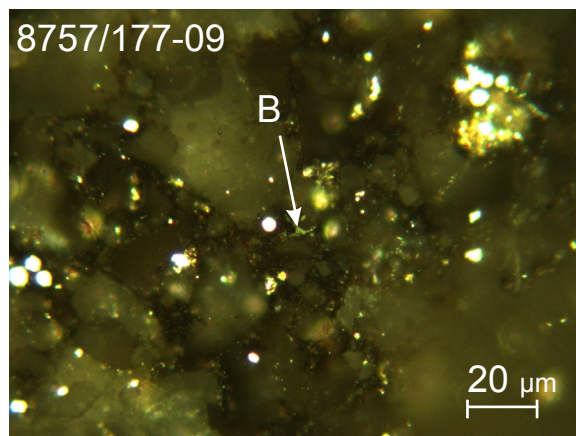
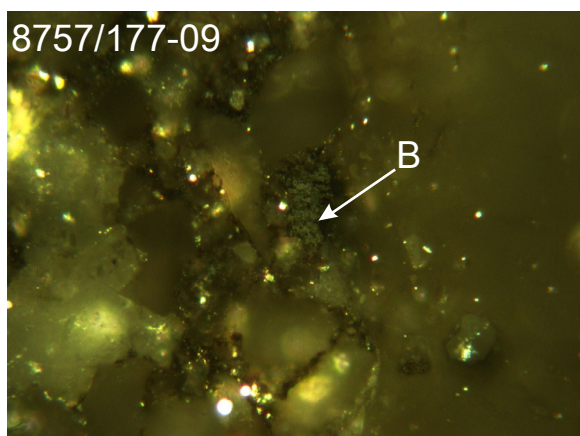
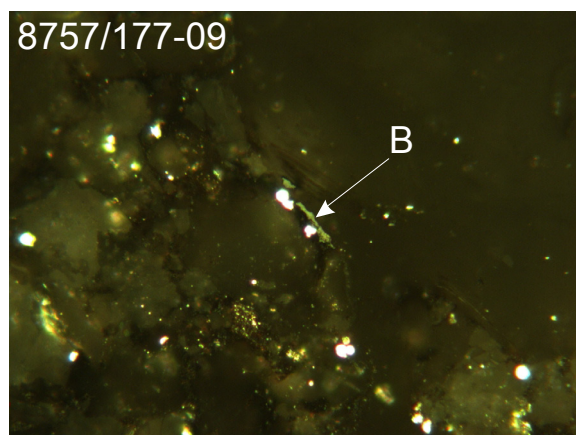
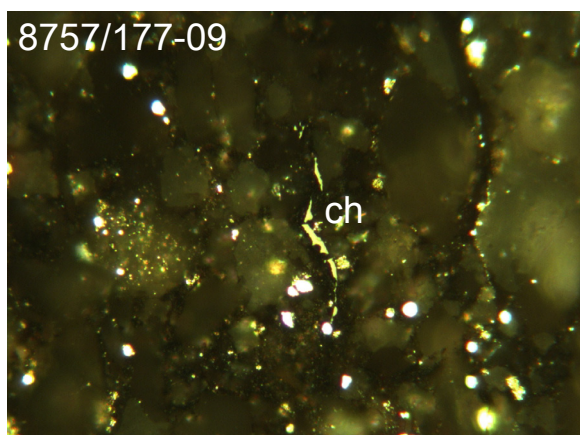
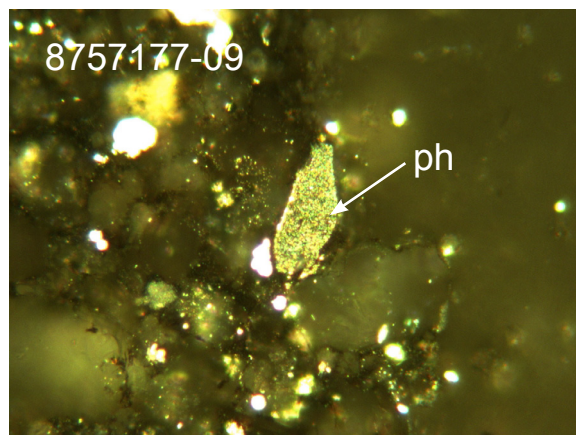
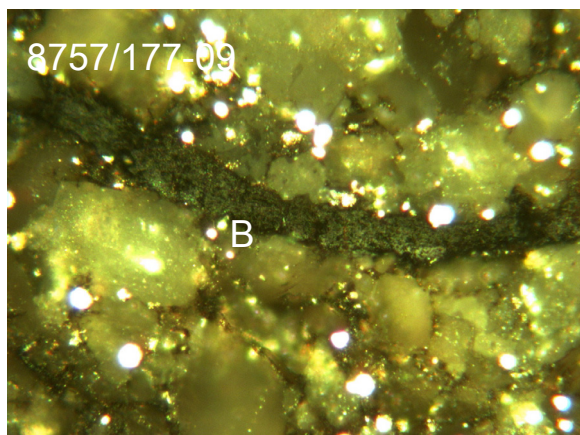






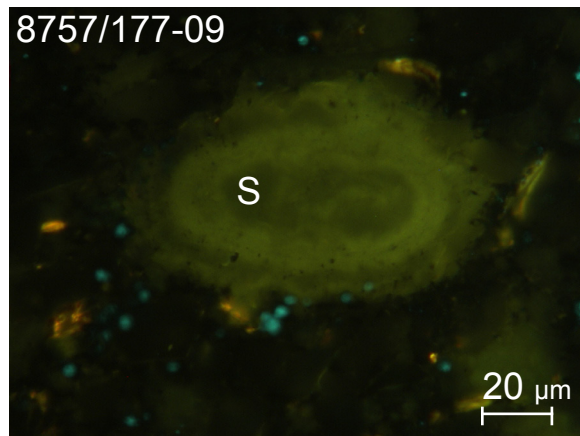
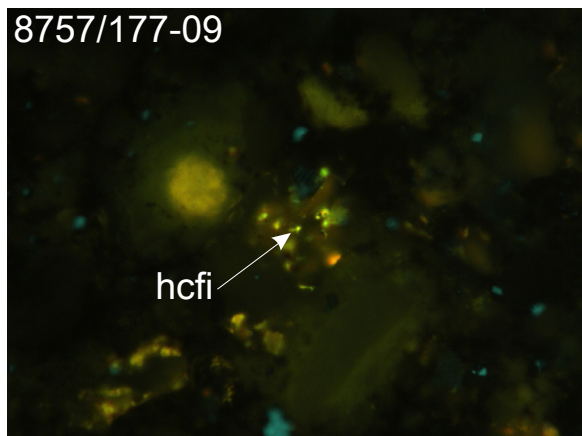
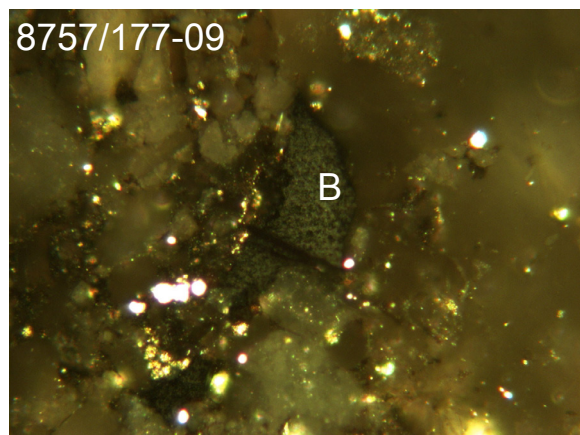
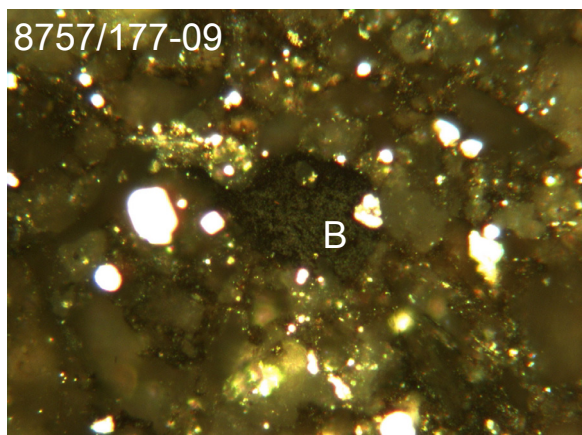
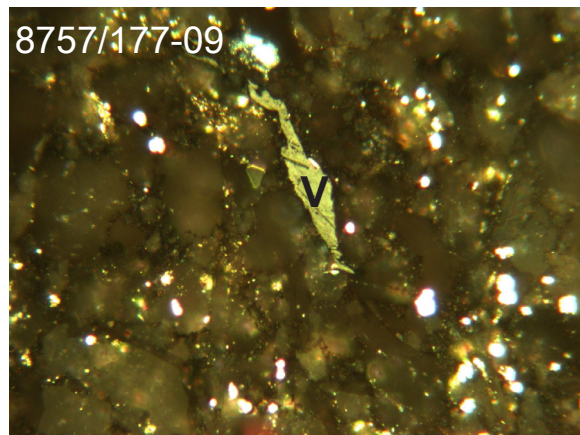
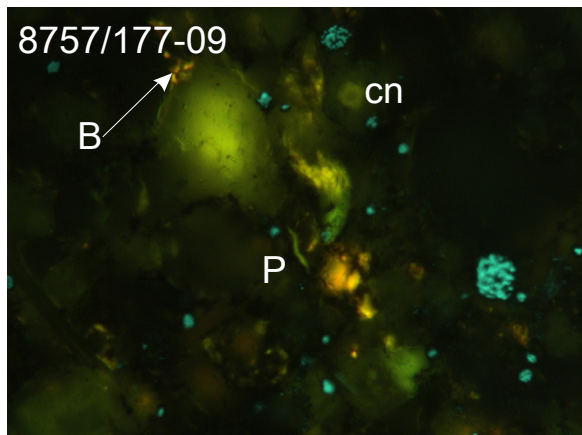
AGS 8755/GSC 290-09 (Montney; 100/07-05-067-07W6/00; 10,119.7 ft. core depth). Major amount of an interconnected network of amorphous kerogen (am) in siltstone with a high amount of framboidal pyrite inclusions possibly as a result of biodegradation of the organic matter early in its burial history. Rare, thin, long and amorphous lenses of alginite-derived vitrinite (V) maceral and bitumen (B). P = Prasinophyte. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

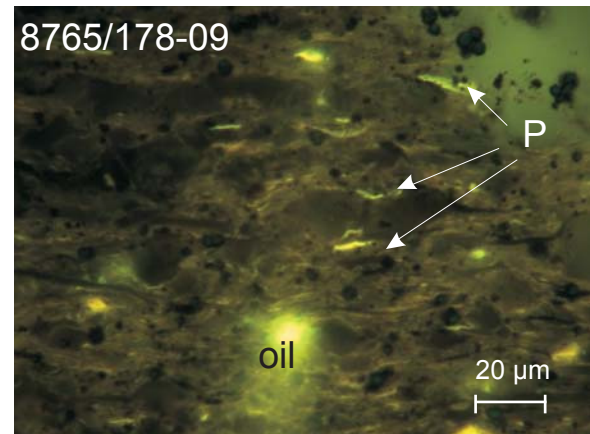
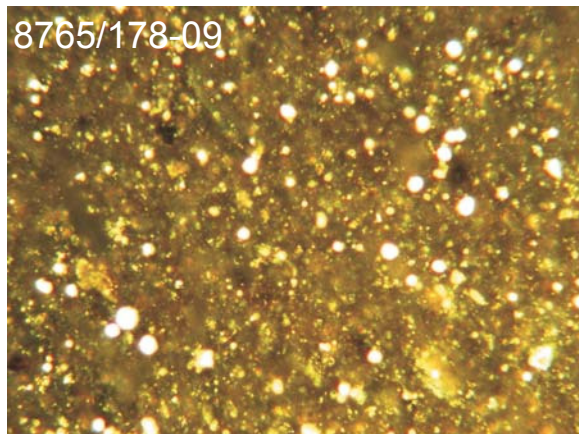
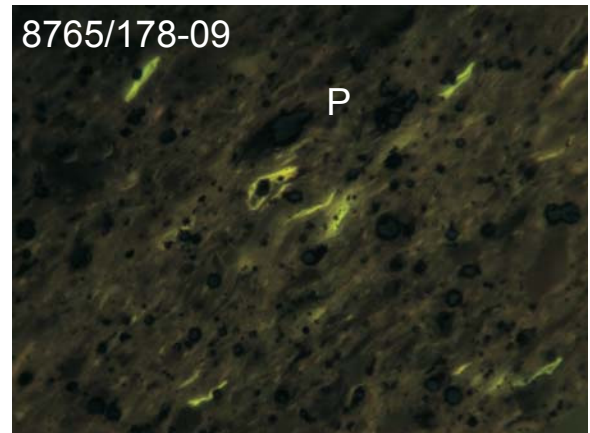
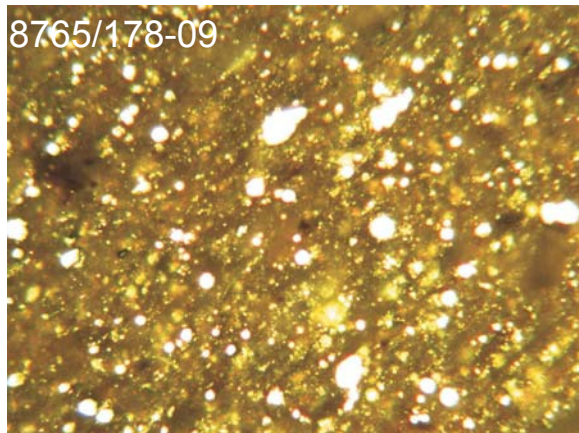
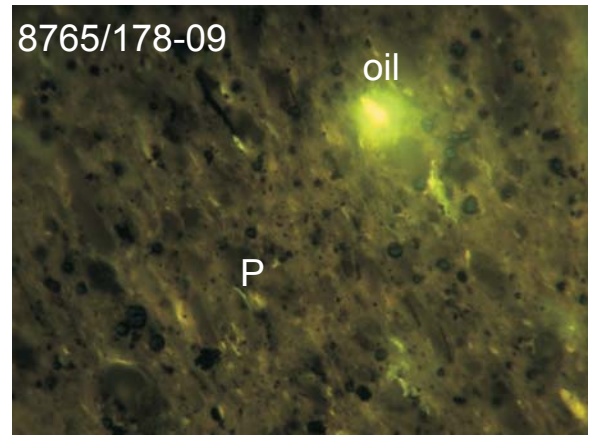
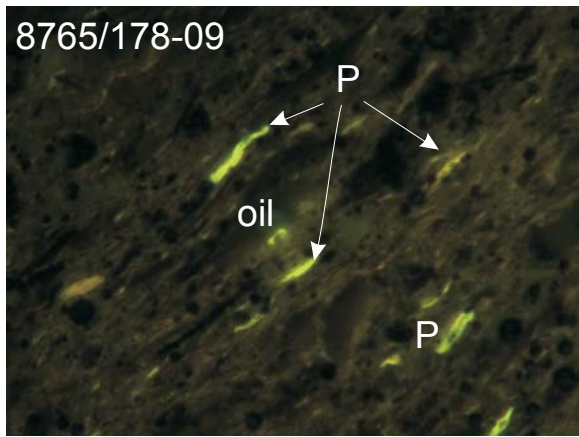




AGS 8757/GSC 177-09 (Montney; 100/07-05-067-07W6/00, 3093.7 m core depth). Organically rich brown, silty shale with mostly framboidal pyrite-rich amorphous kerogen brecciated within the intergranular pores of a carbonate matrix. Minor amount of non-fluorescing, large granular and small isotropic lenses of pore-filling and fracture-filling primary bitumen (B) dispersed mainly within intergranular pores. Rare to trace amount of orange-fluorescing *Prasinophyte* (P) alginite, siliceous microfossils (S, probably derived from radiolaria) and chitinous microfossils (ch, probably derived from chitinozoans), greenish-yellow fluorescing hydrocarbon fluid inclusions (hcfi), and possible calcareous nanofossils (cn). Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). ph = phosphatic nodules.

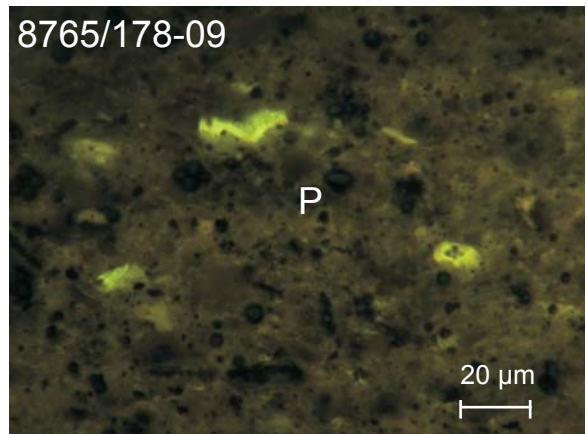
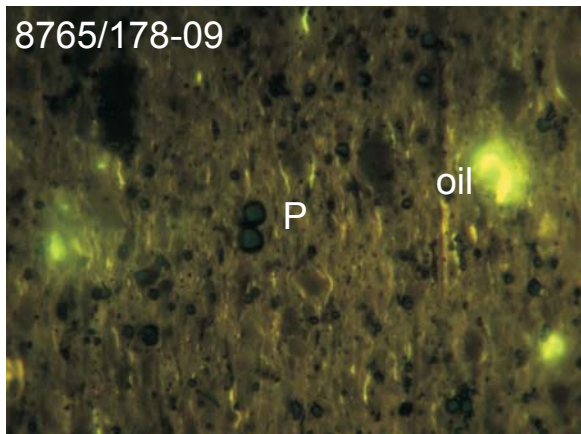
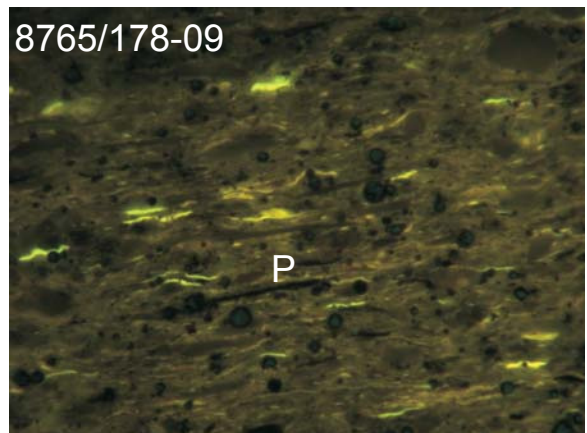
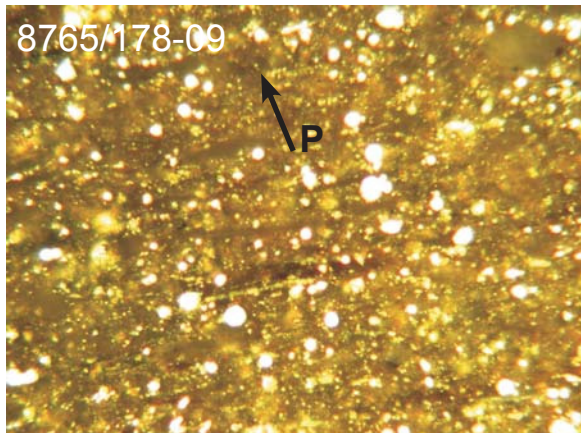
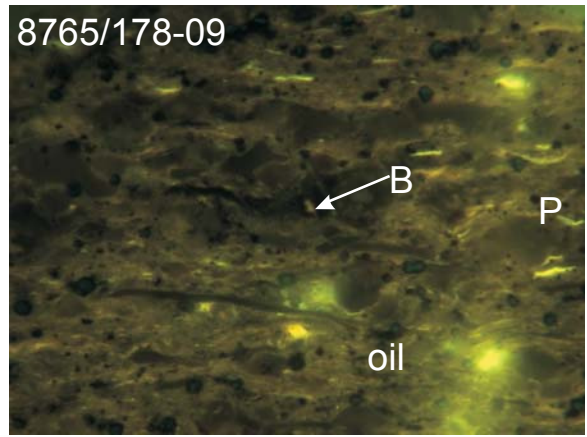
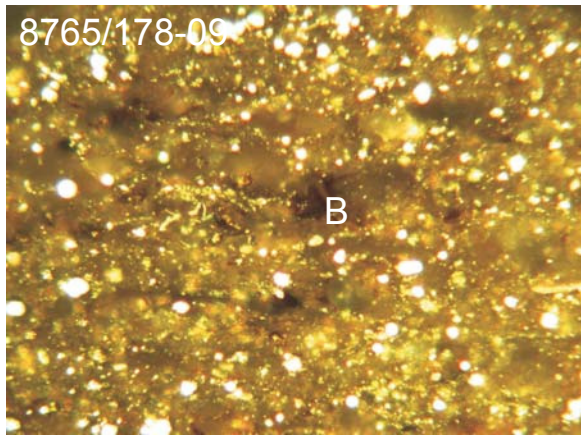




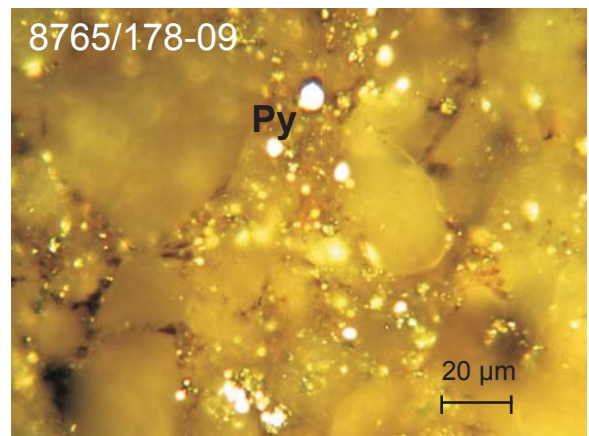
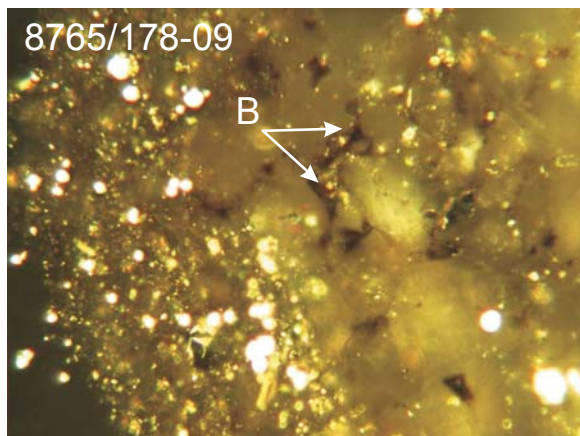
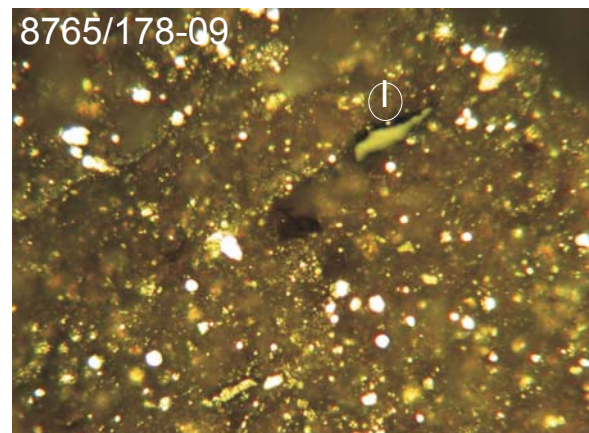
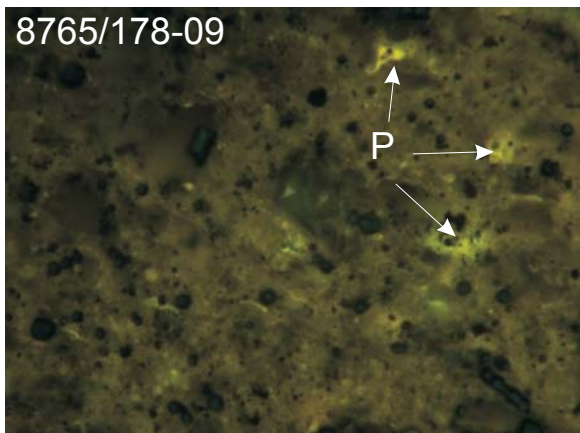
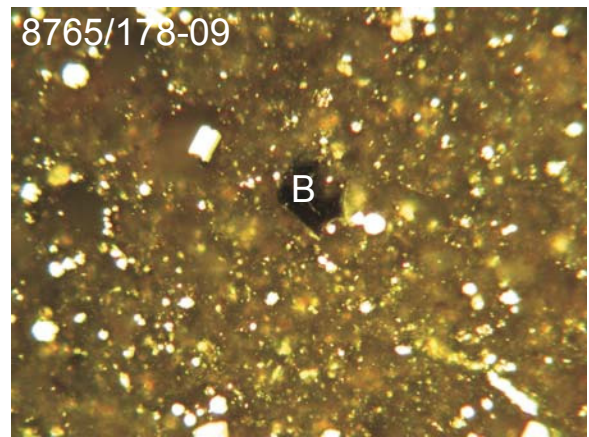
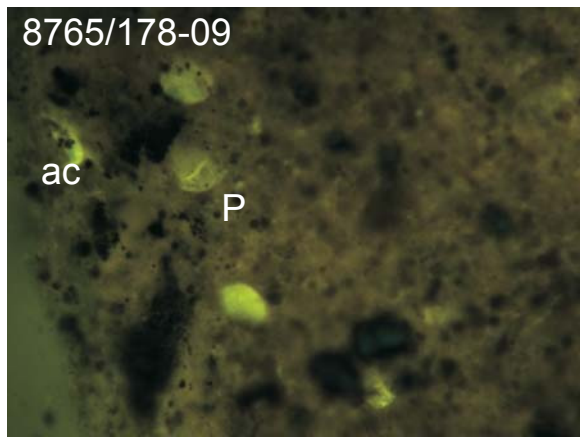


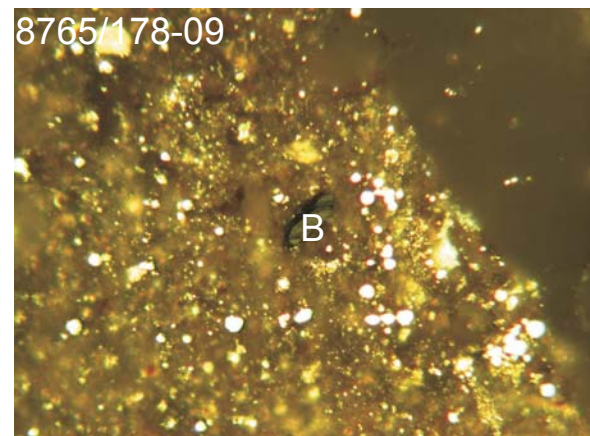
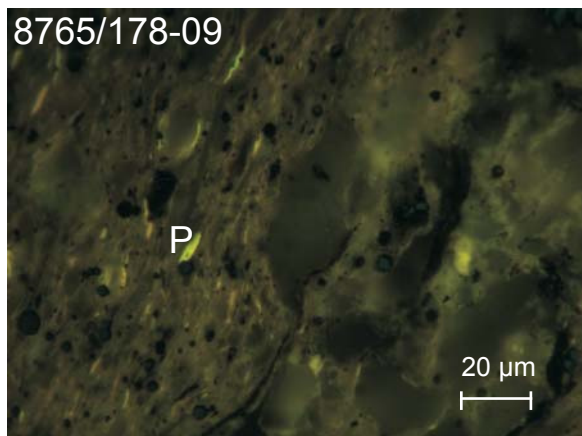
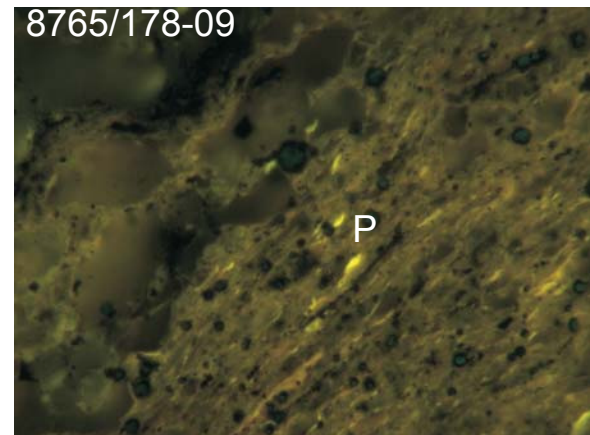
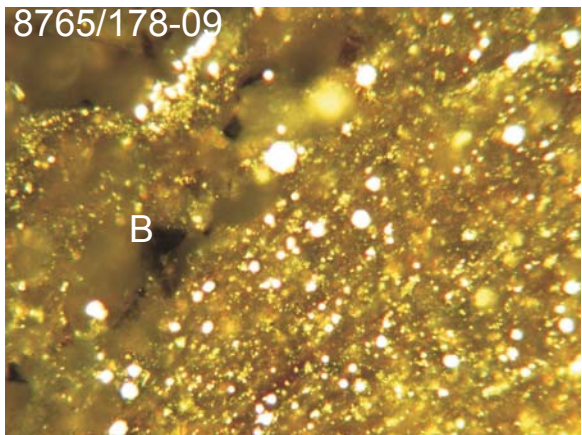
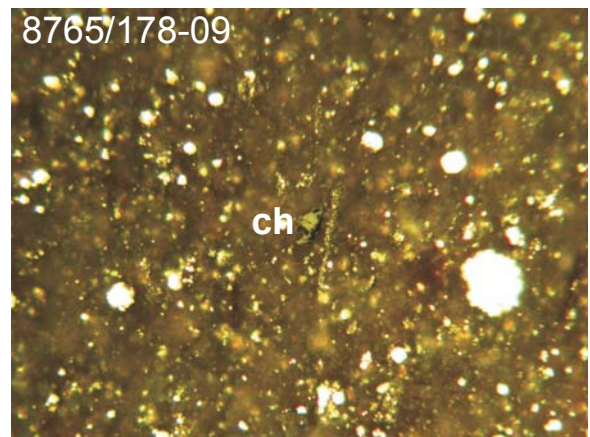
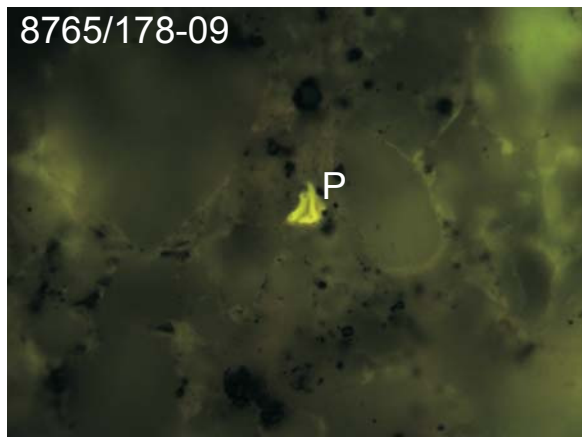
AGS 8765/GSC 178-09 (Montney; 100/11-28-071-03W6/00, 1845.8 m core depth). Brown, silty shale with a major amount of dull yellow-fluorescing Prasinophyte (P) alginite widely dispersed within framboidal pyrite-rich amorphous kerogen. Major to minor amounts of bright yellow-fluorescing soluble oil/asphaltine (oil) causing staining and partial saturation. Rare, yellow-fluorescing spiny acanthomorphic acritarch (ac) and possibly chrysophytes. Rare, orange-fluorescing bitumen and non-fluorescing primary bitumen (B) within intergranular pores. Very rare allocthonous inertinite maceral (I). Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). ch = chitinous microfossil



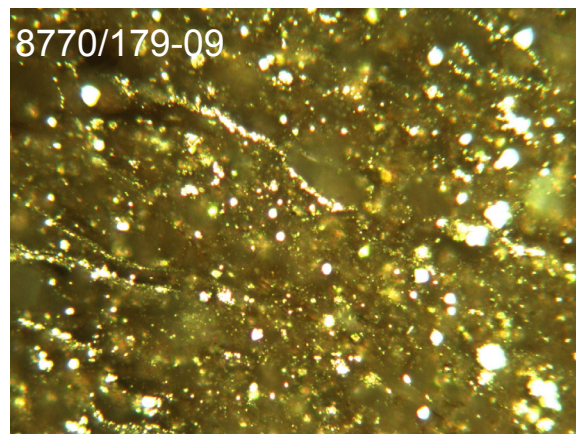
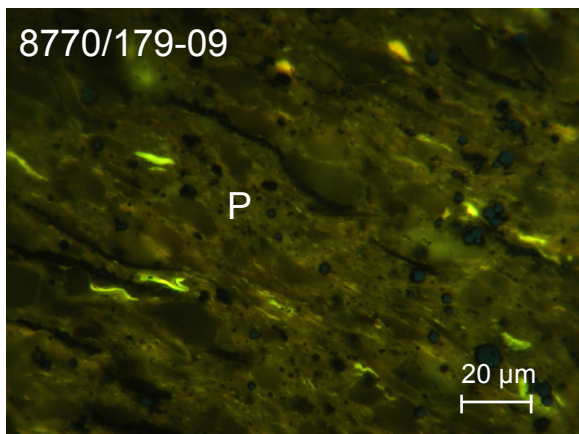
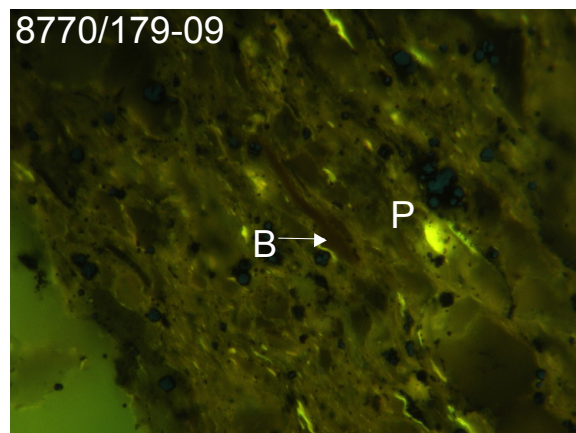
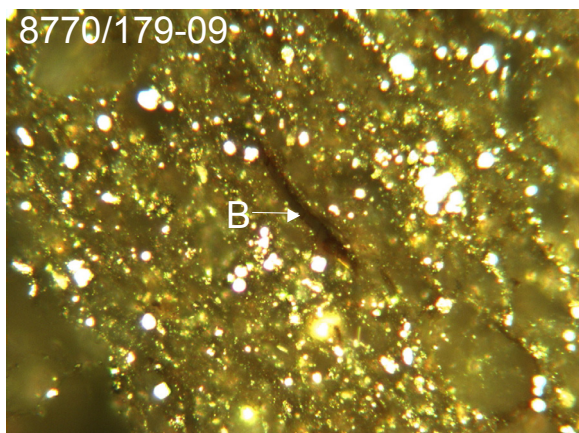
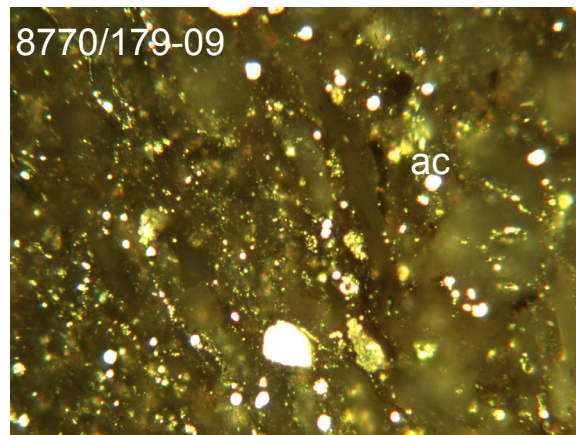
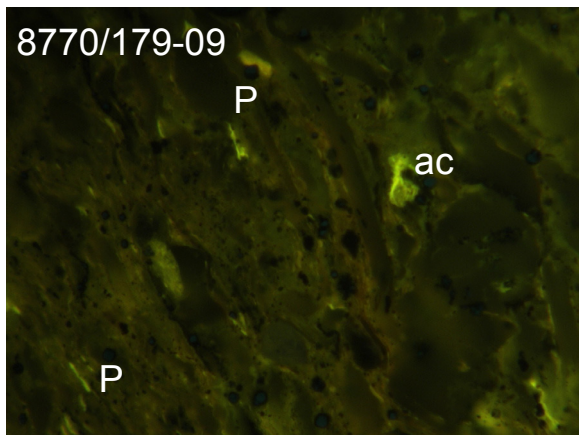






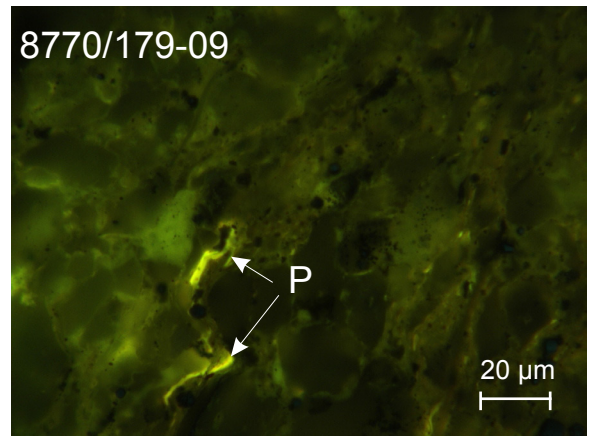
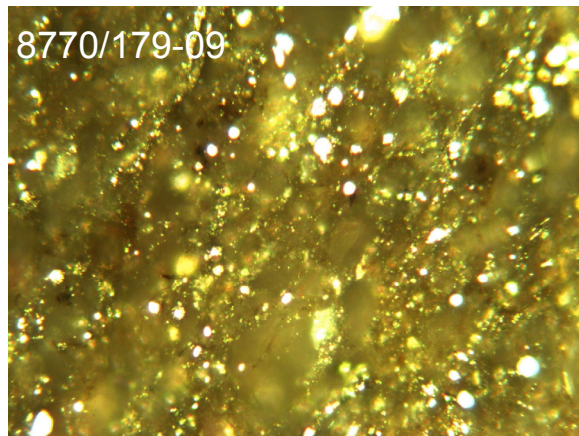
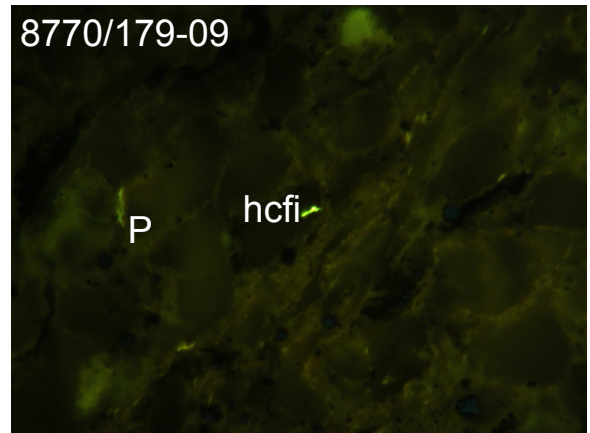
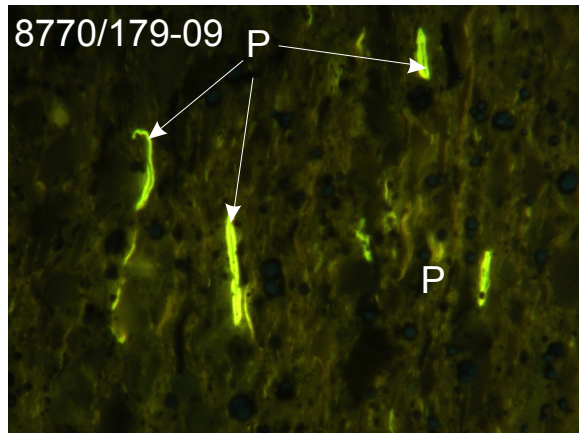
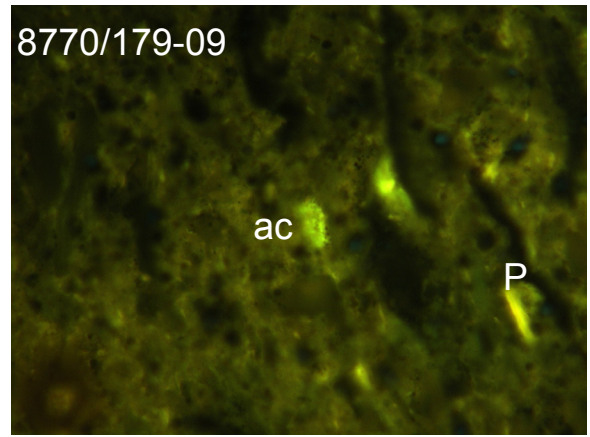
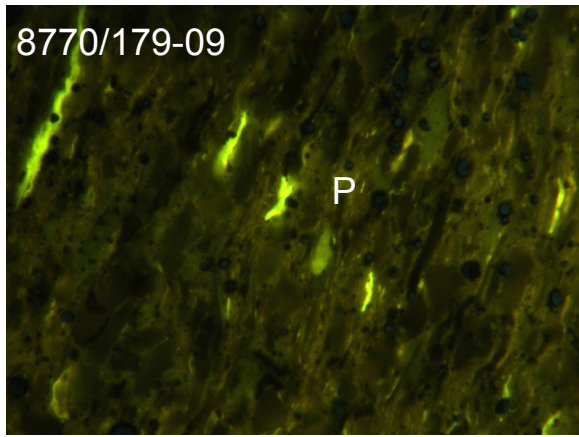


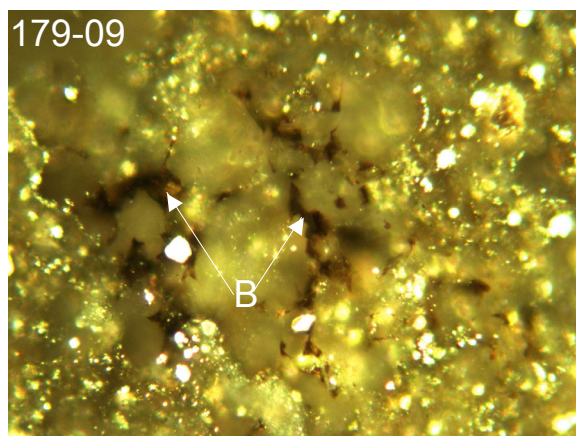
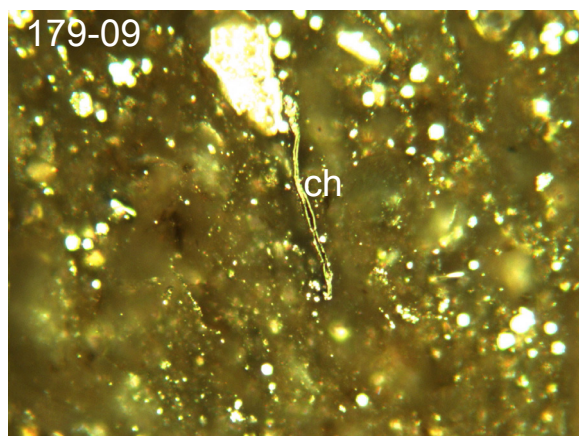
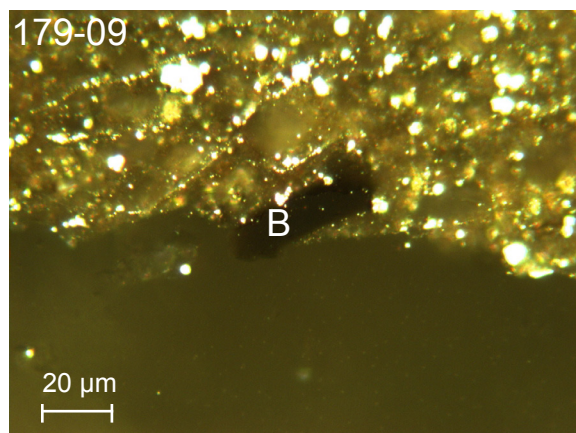
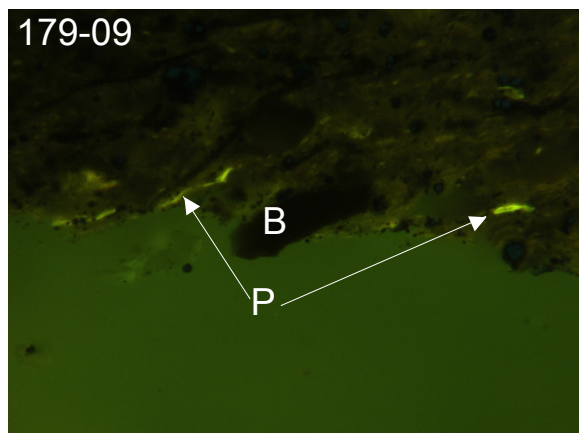
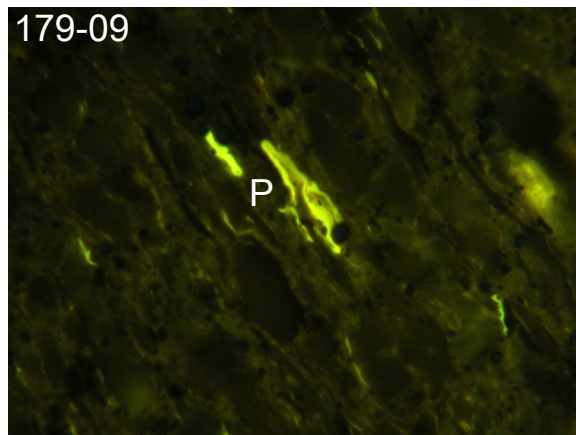
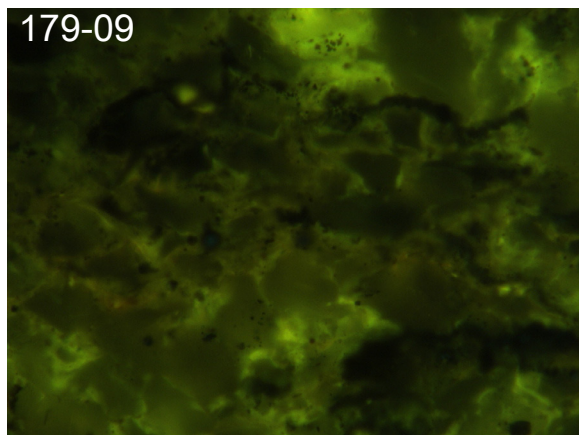




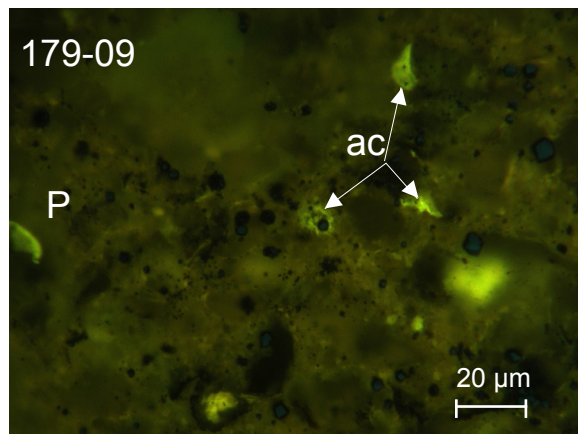
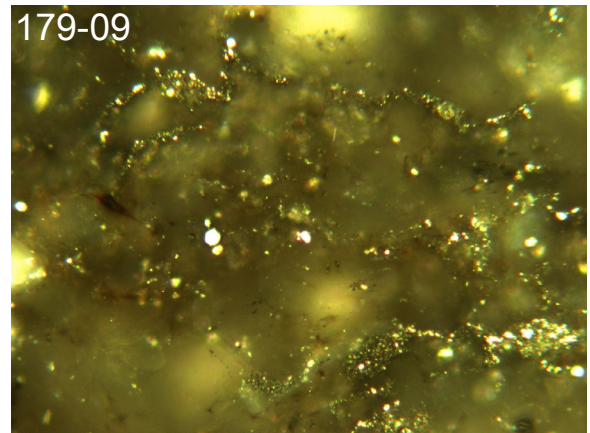
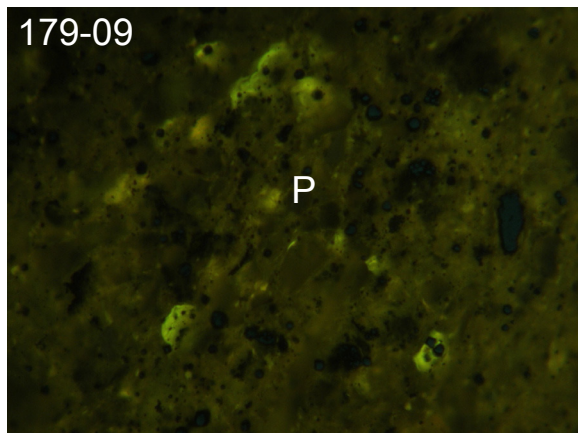
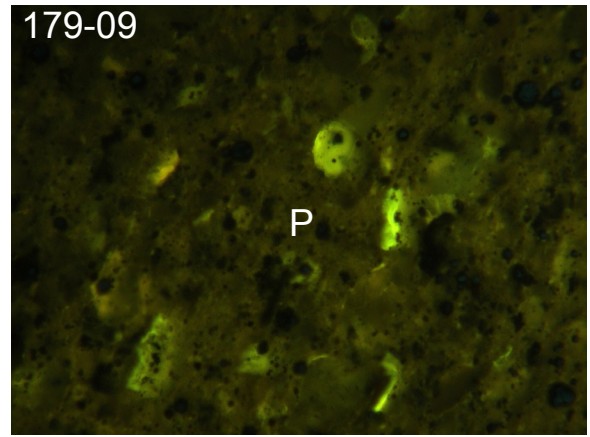
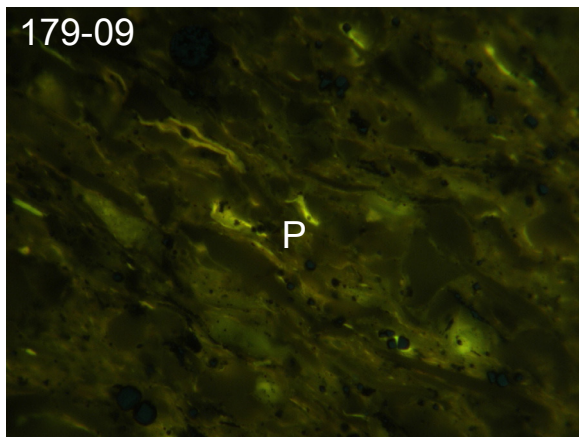
AGS 8770/GSC 179-09 (Montney; 100/11-28-071-03W6/00, 1862.8 m core depth). Silty shale with rare, coarse-grained siltstone matrix. Major amount of golden to dull-yellow fluorescing Prasinophyte (P) alginite in a framboidal pyrite-rich silty shale. Primary bitumen (B) is observed within intergranular pores of the siltstone matrix with traces of yellow- to orange-fluorescing asphaltine annealed between brecciated carbonate grains. A minor amount of yellow-fluorescing, spiny acanthomorphous acritarchs (ac, *Multiplicispraeridium* sp.) is also observed. Bright, yellow-fluorescing hydrocarbon fluid inclusions (hcfi) are also observed as annealed within the mineral matrix. There are also trace amount soft chitinous microfossils (ch) derived from chitinozoans. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

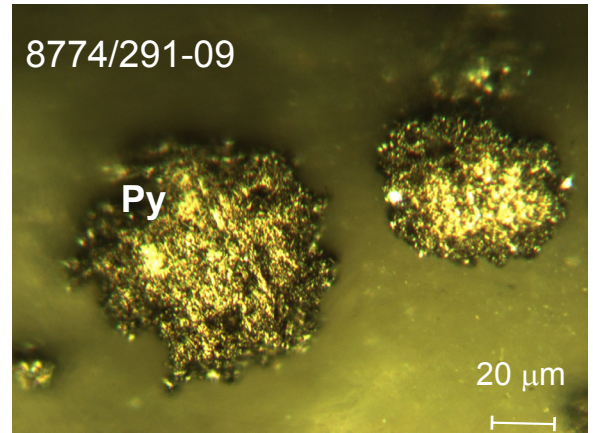
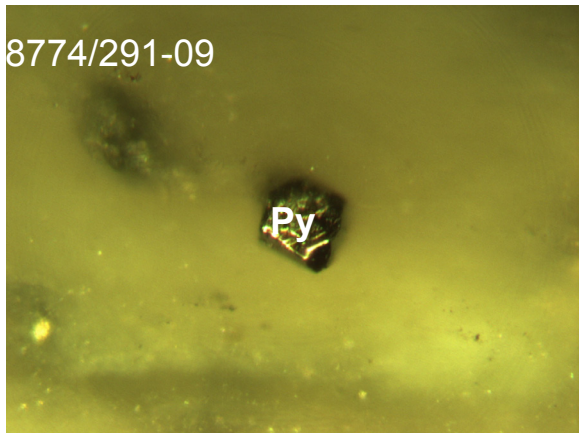
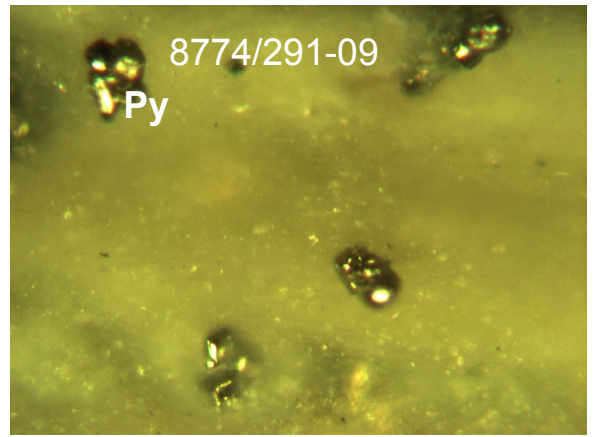
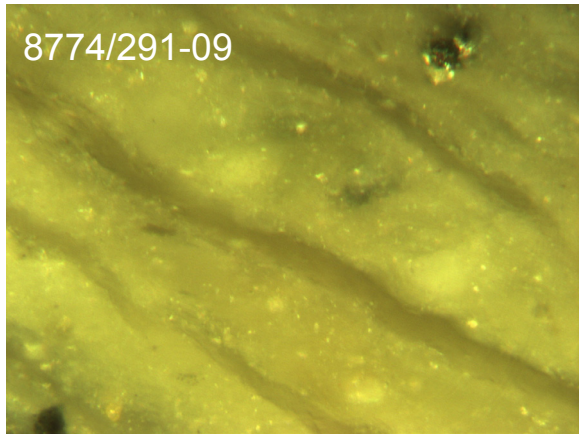






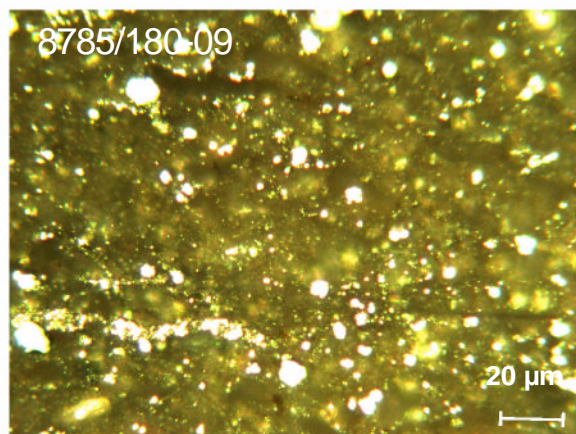
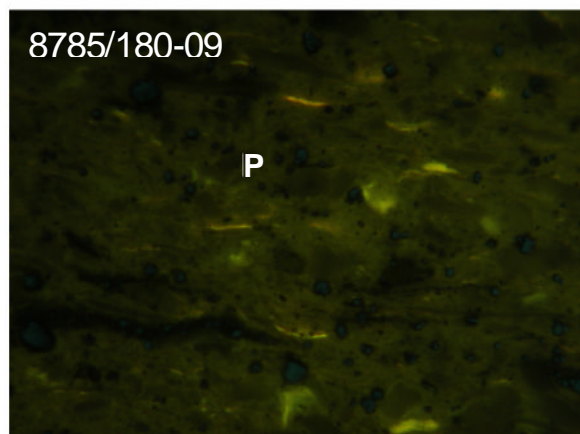
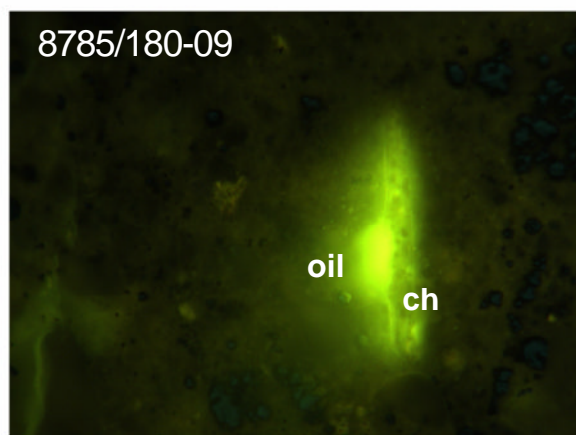
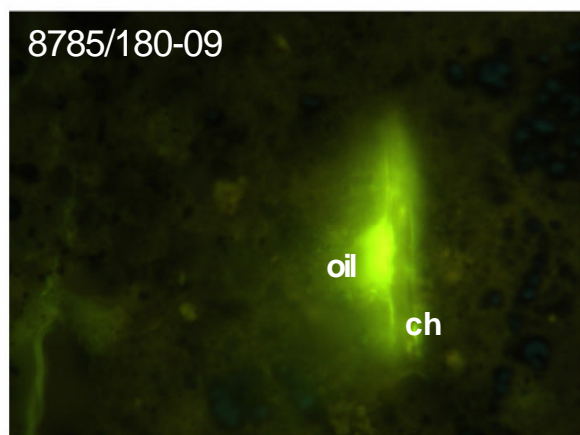
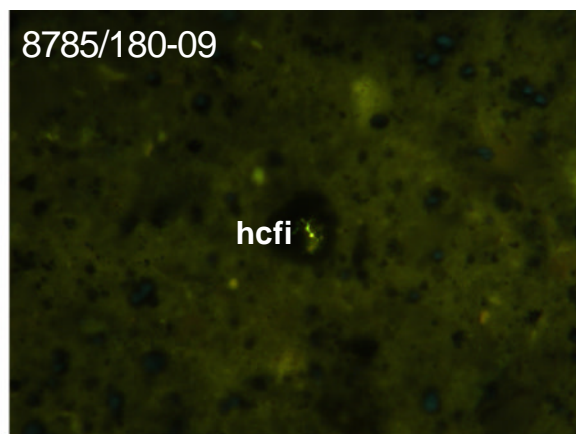
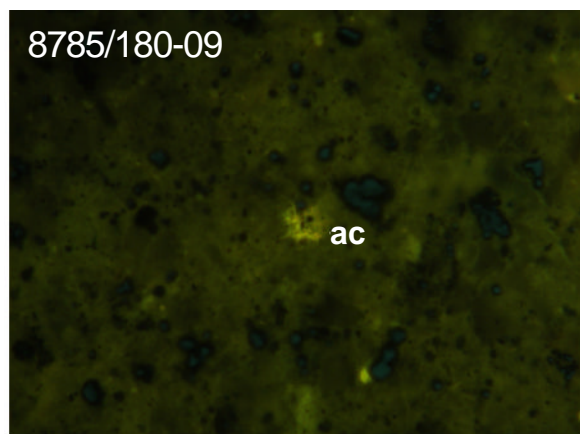




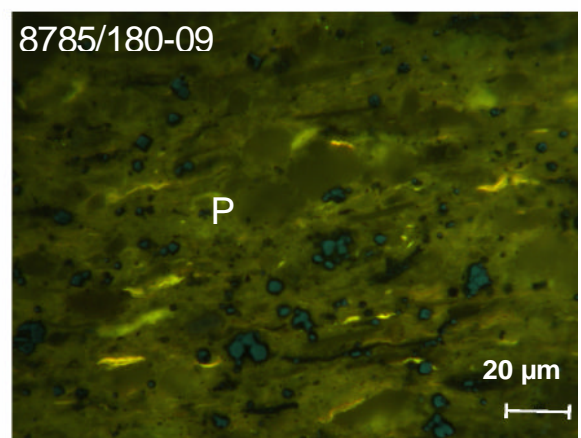
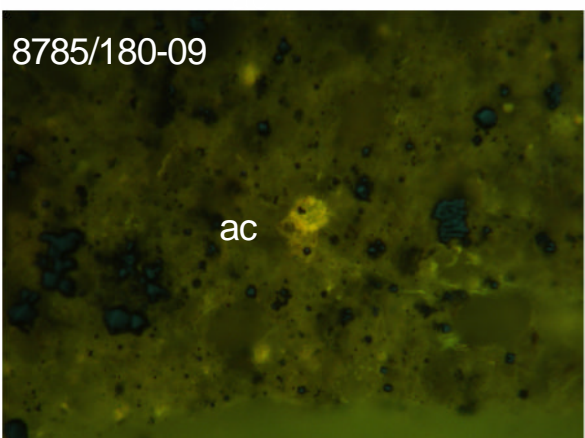
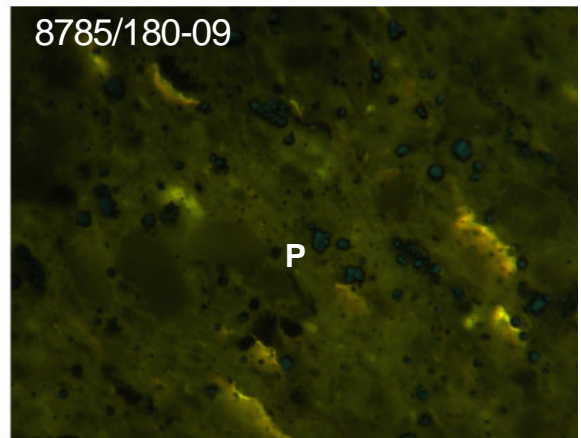
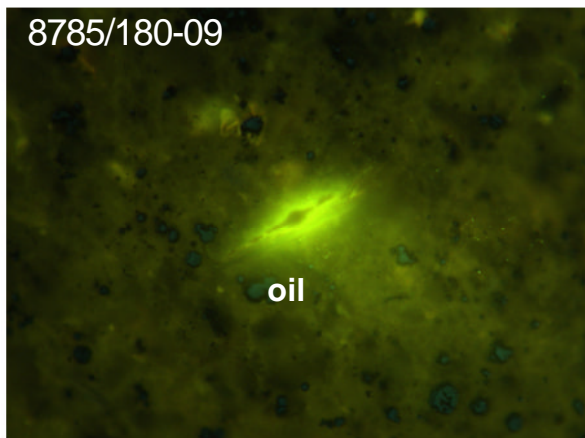
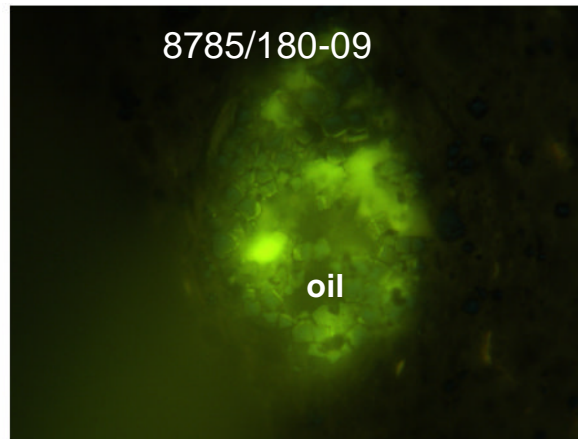
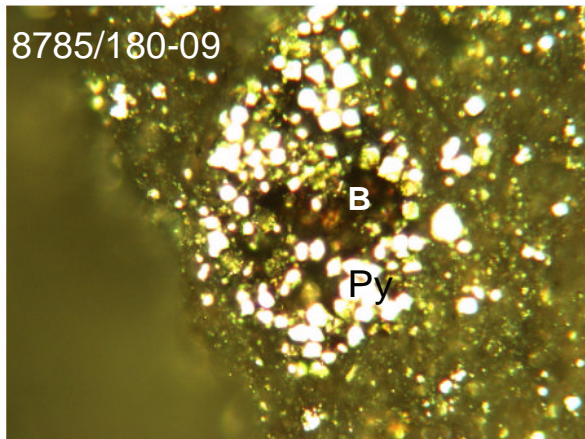


AGS 8774/GSC 291-09 (Montney; 100/10-21-092-03W6/00, 2562.5 ft. core depth). Organically-lean carbonate-dominated siltstone with a rare amount of mainly framboidal pyrite (Py) and no fluorescing organic matter observed. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

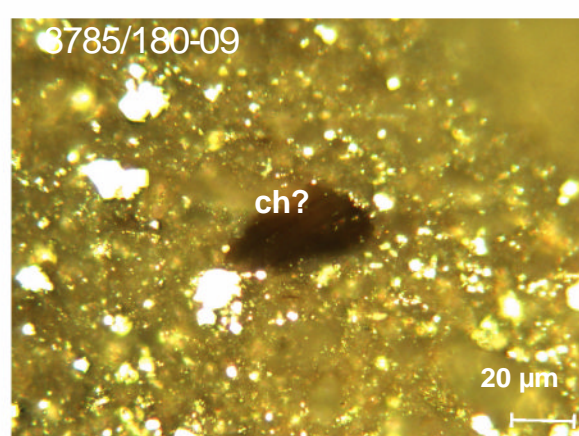
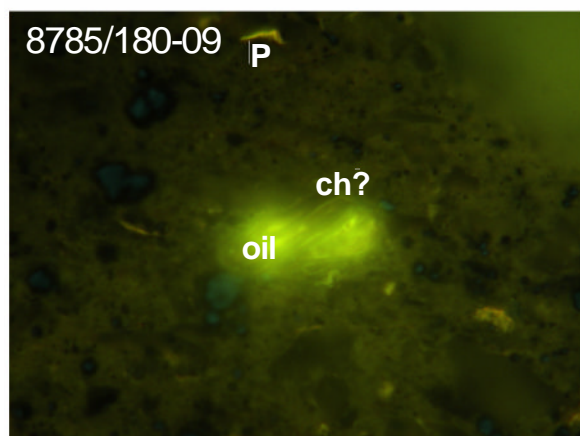
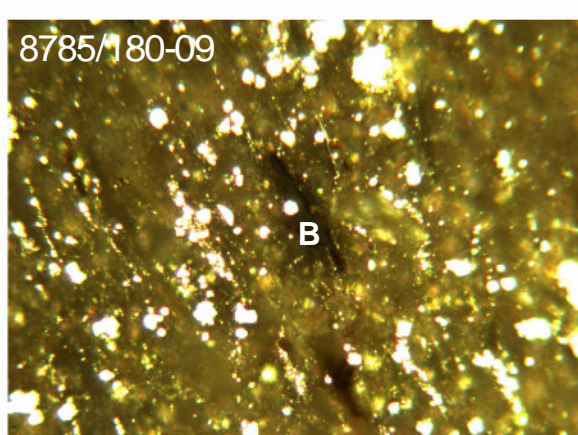
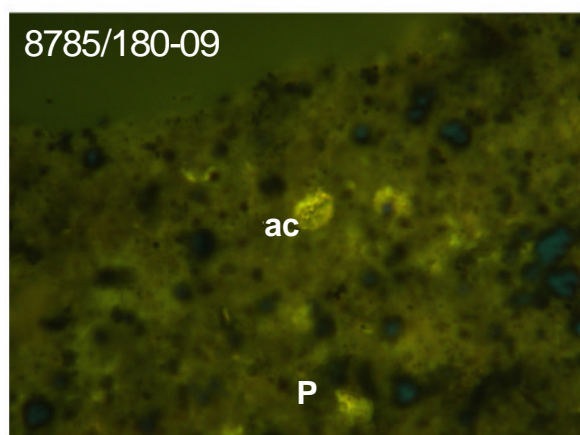
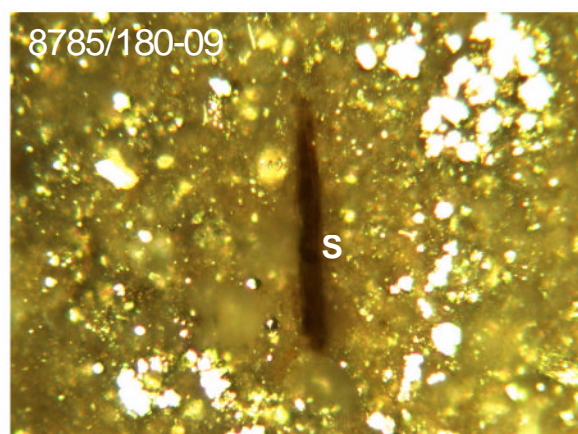
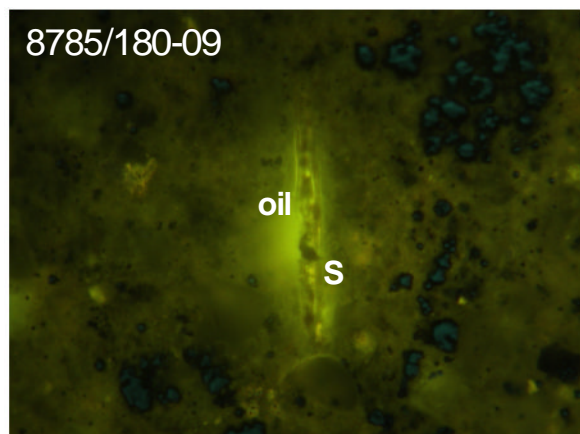


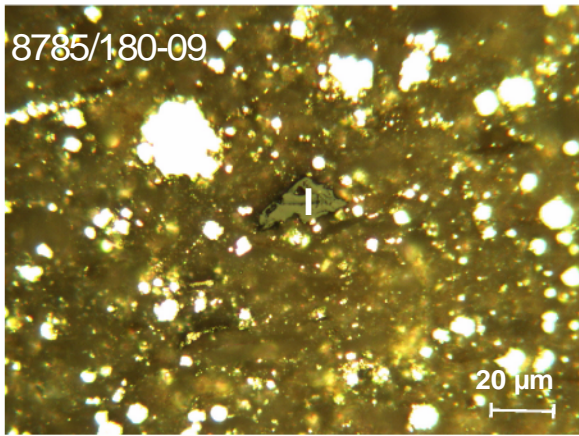
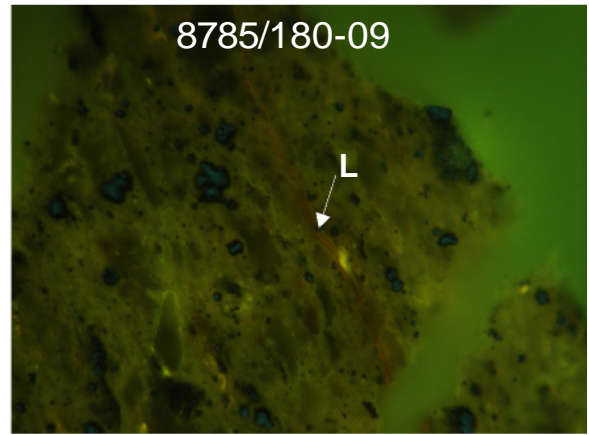
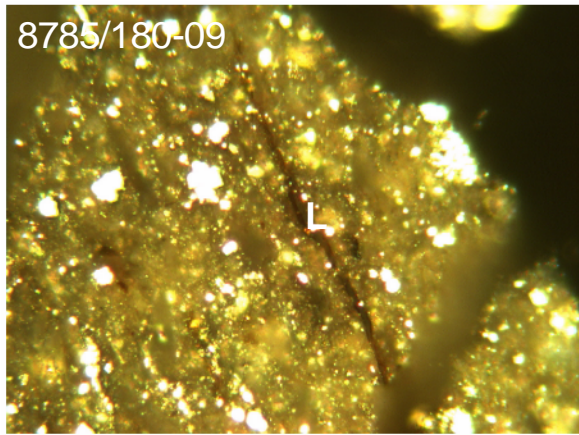


AGS 8785/GSC 180-09 (Montney; 100/13-05-068-01W6/00, 2057.4 m core depth). Similar to sample AGS 8770/GSC 179-09. Mainly silty shale with a rare, coarse-grained siltstone matrix. Major amount of Prasinophyte (P) alginite observed mainly in the framboidal pyrite-rich (Py), silty shale. Minor to rare amount of yellow fluorescing, spiny acanthomorphic acritarchs (ac, *Multiplicispraeridium* sp.). Rare primary bitumen (B) is also noted within intergranular pores, some with traces of yellow fluorescing soluble bitumen. Oil stains (oil) are also observed as being released from the siliceous diatom-like frustules. Very rare, bright yellow fluorescing hydrocarbon fluid inclusions (hcfi) within the mineral matrix are also observed. There is also a trace amount of chitinous microfossils (ch). S = Siliceous microfossil, L = Leiosphaeridia (L), I = Inertinite. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

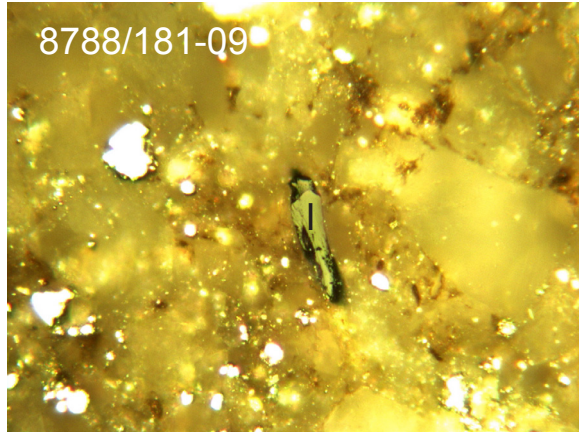
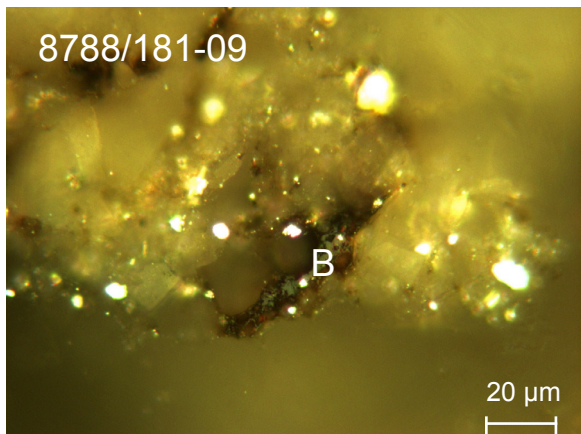
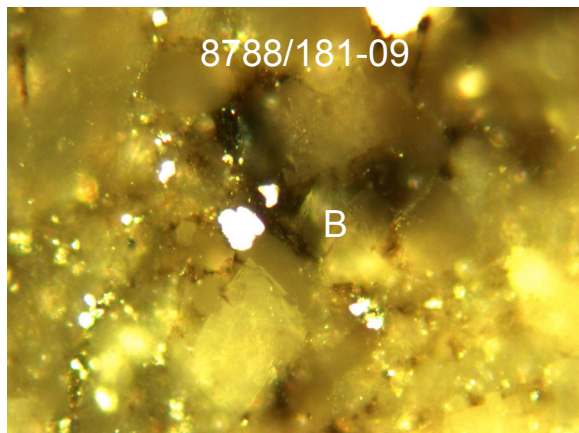
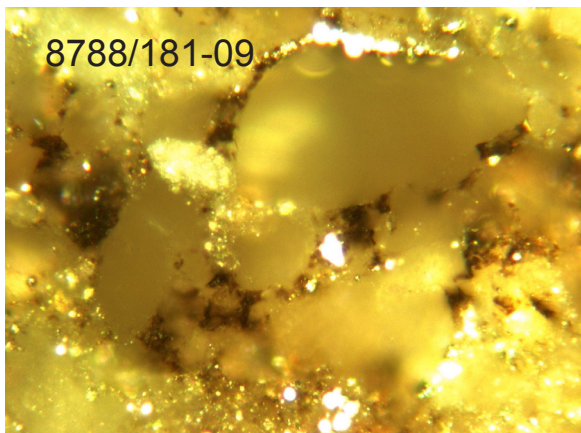
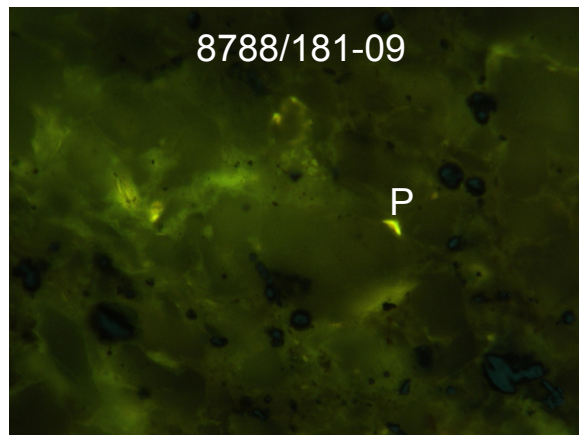
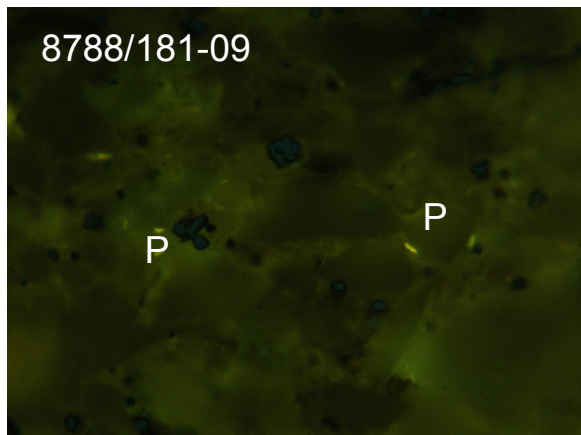






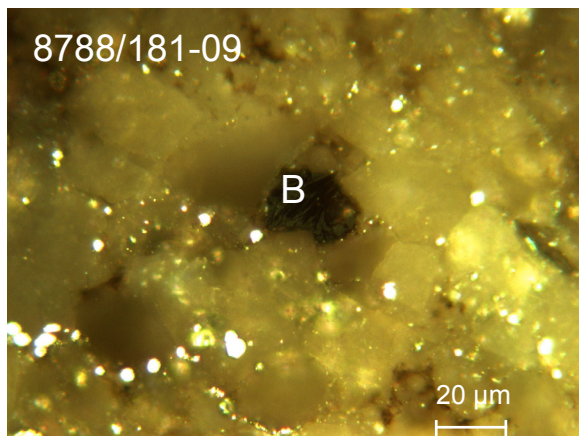
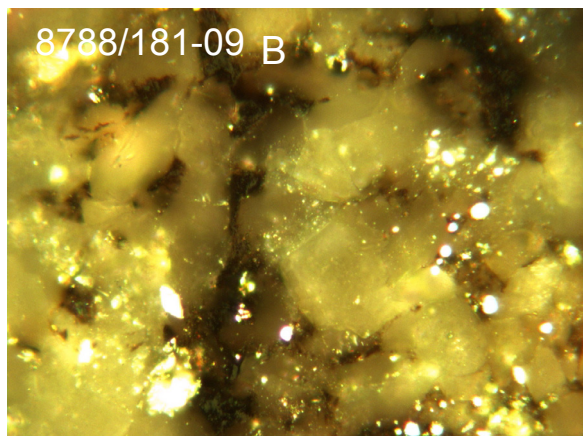
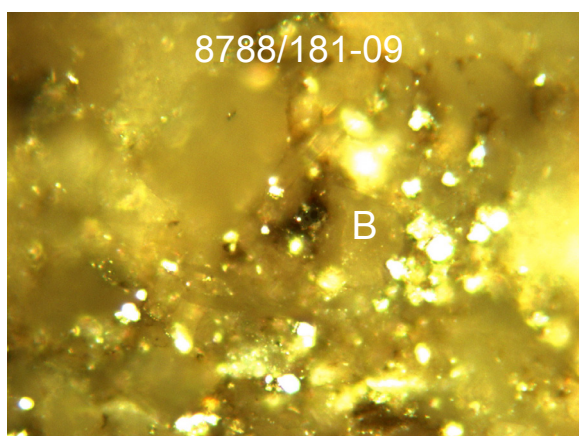
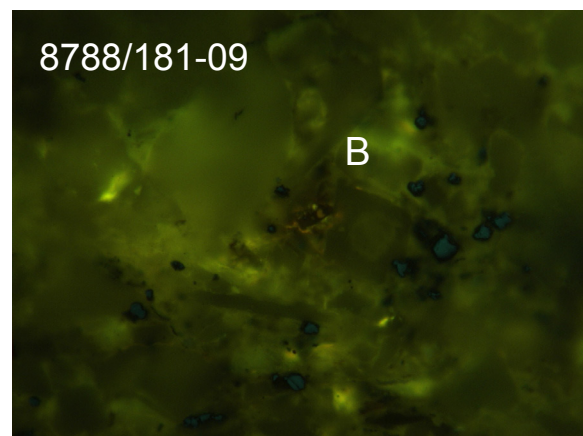
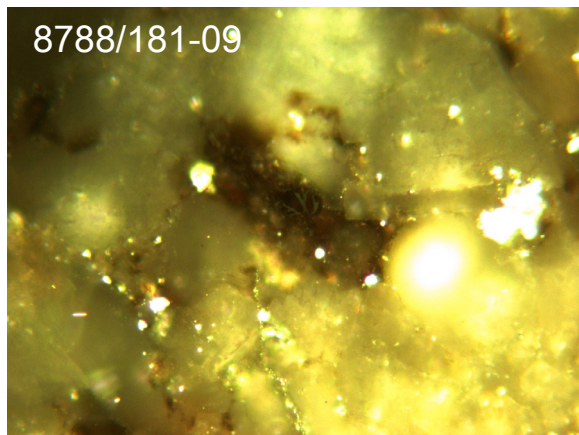
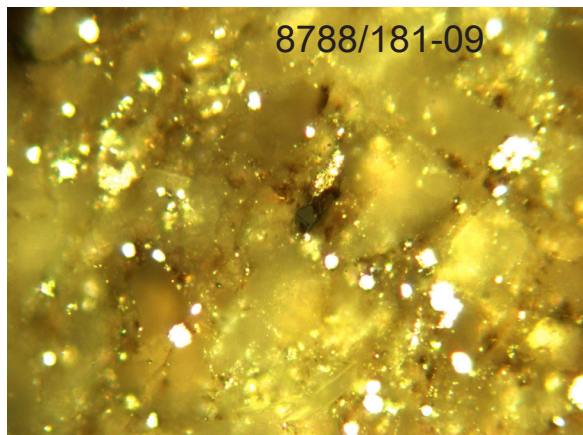


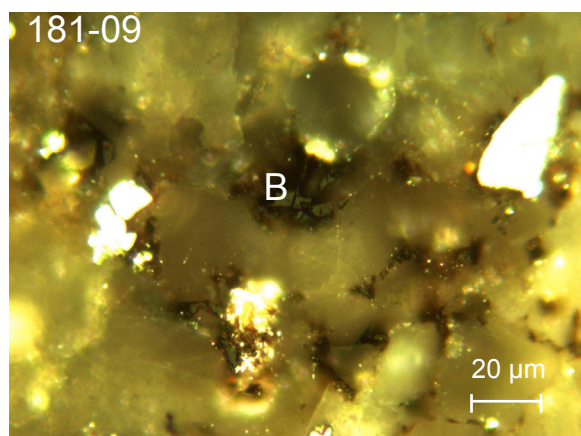
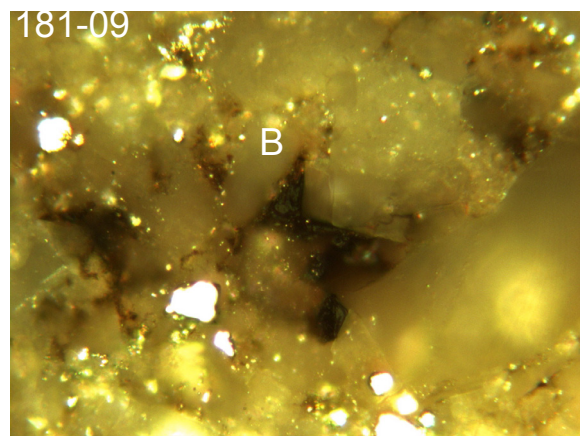
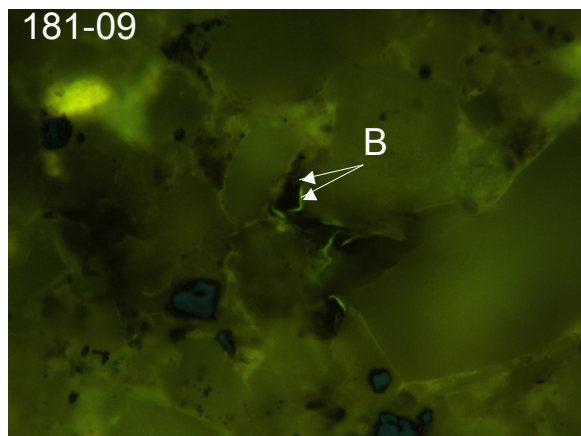




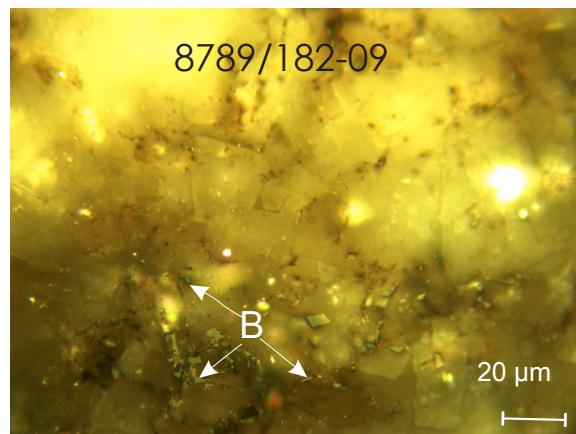
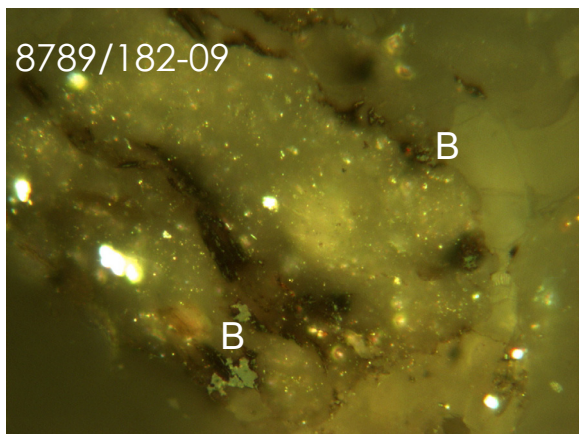
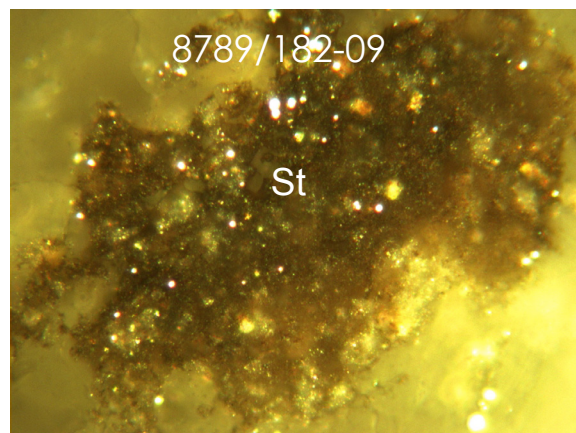
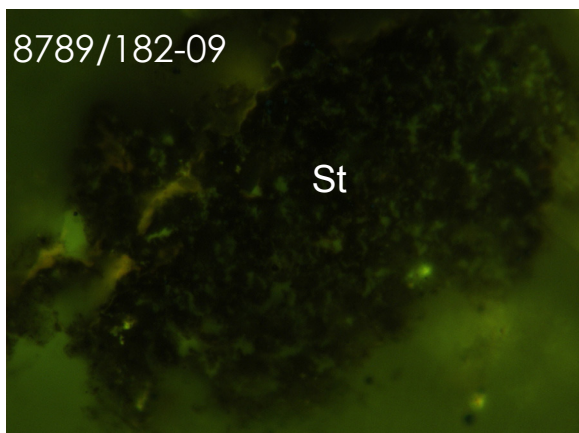
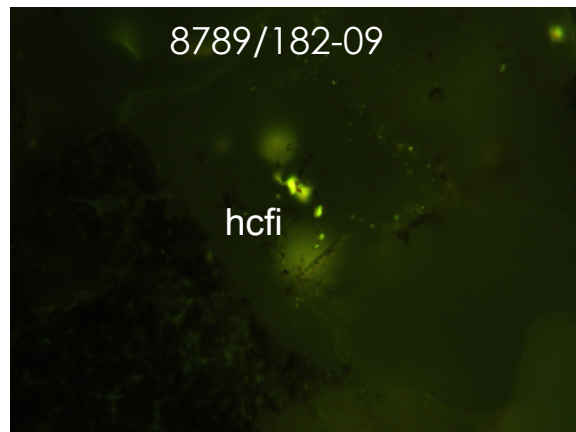
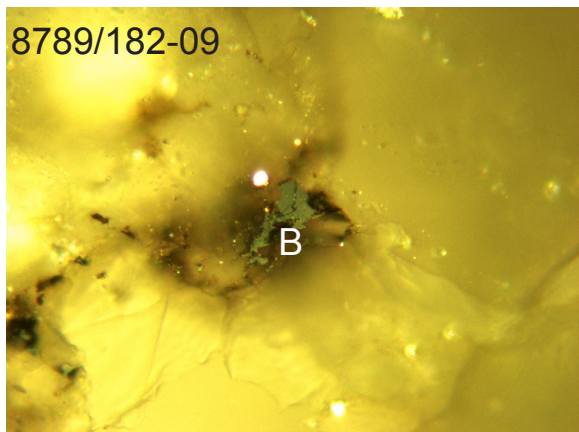
AGS 8788/GSC 181-09 (Montney, 100/13-05-068-01W6/00, 2240.9m core depth). Pyrite-rich, siltstone and very fine-grained sandstone with mostly stylocumulates between intergranular pores. Minor amount of isotropic solid and granular primary bitumen (B) and rare orangefluorescing primary bitumen probably derived from the stylocumulates. Very rare small lenses of Prasinophyte (P) alginite pressed between quartz grains. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). I = Inertinite.





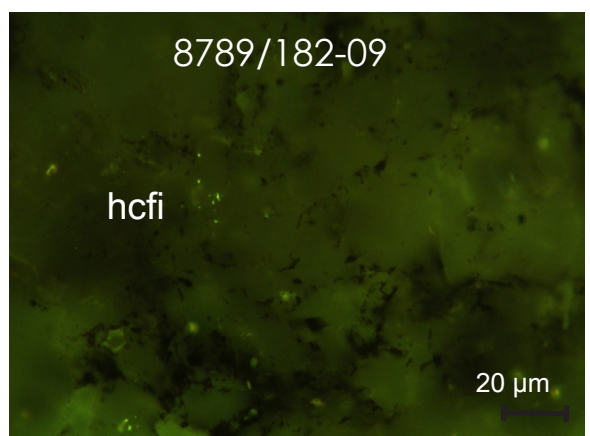
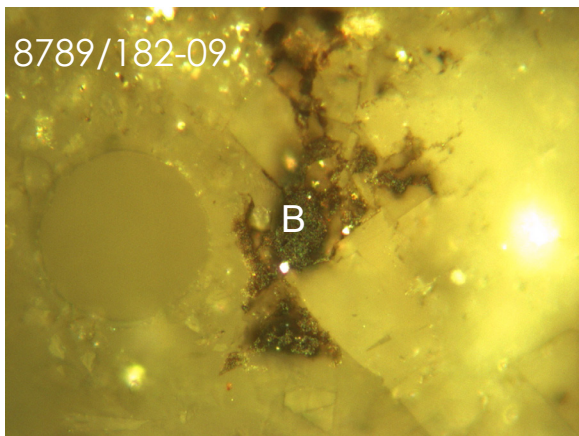
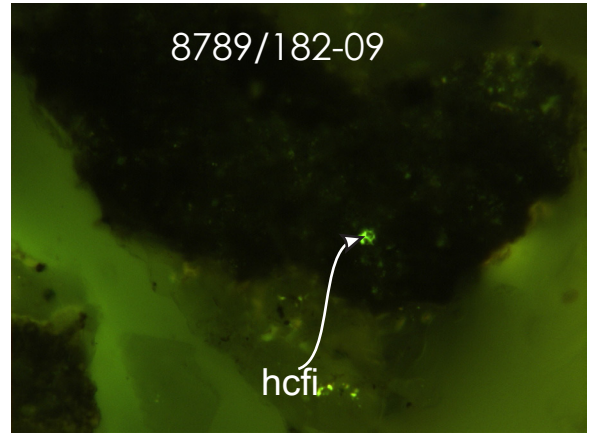
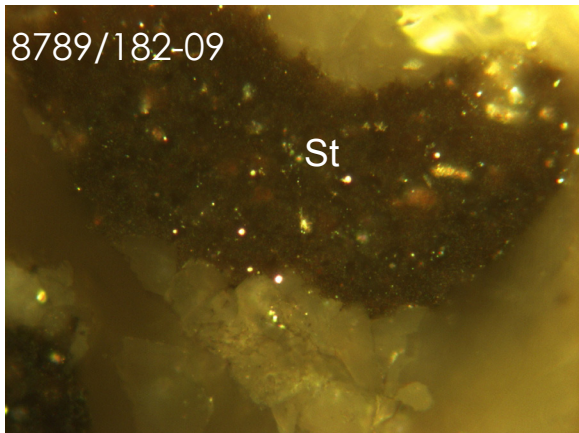
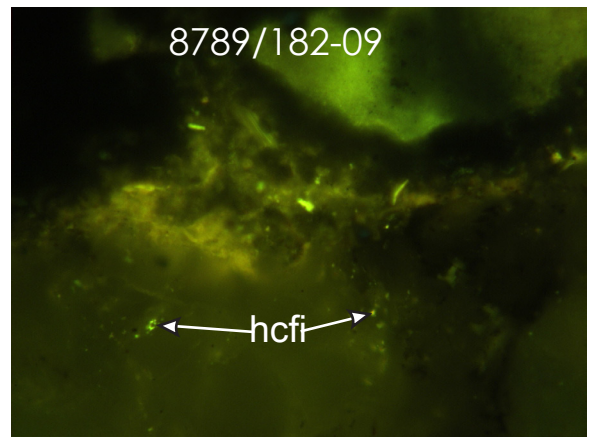
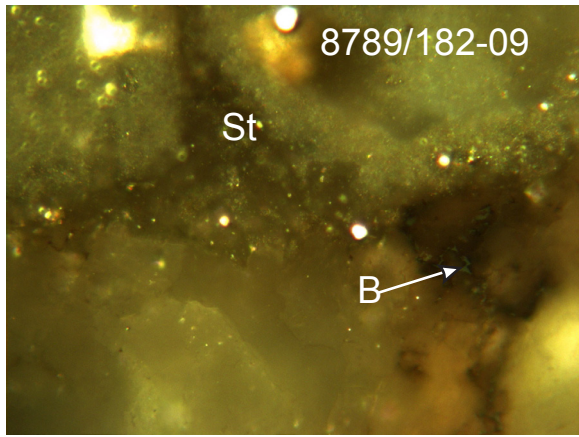


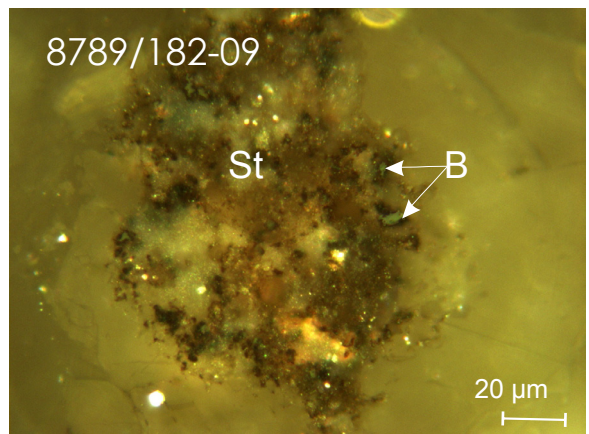
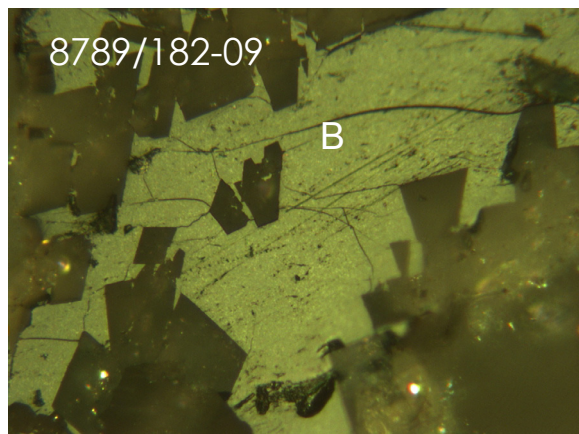
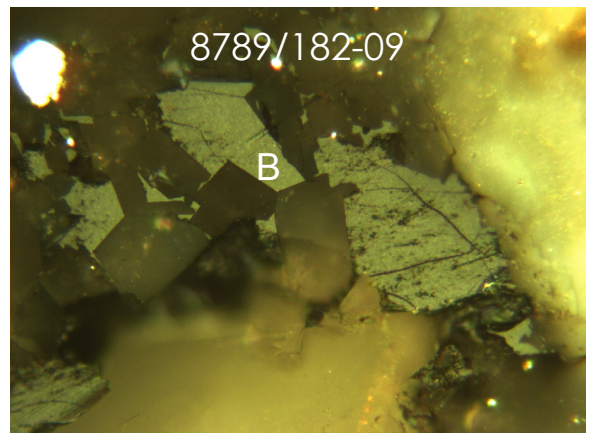
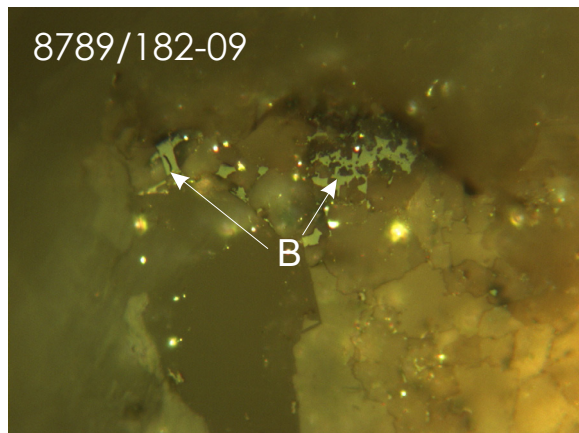
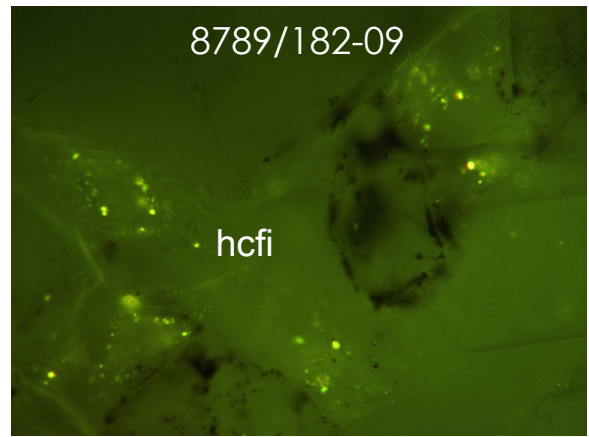
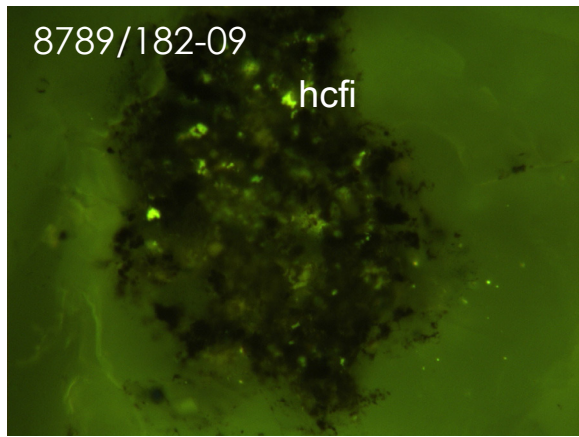




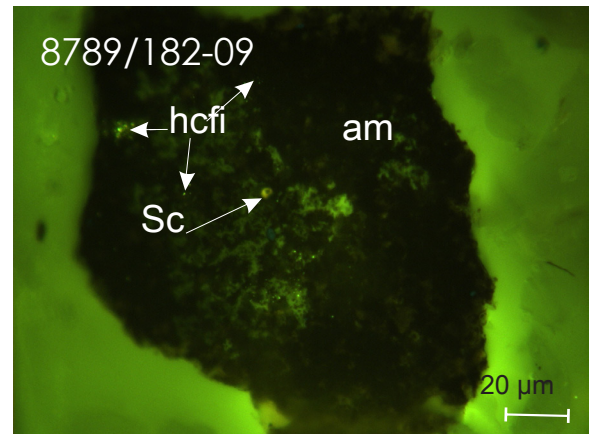
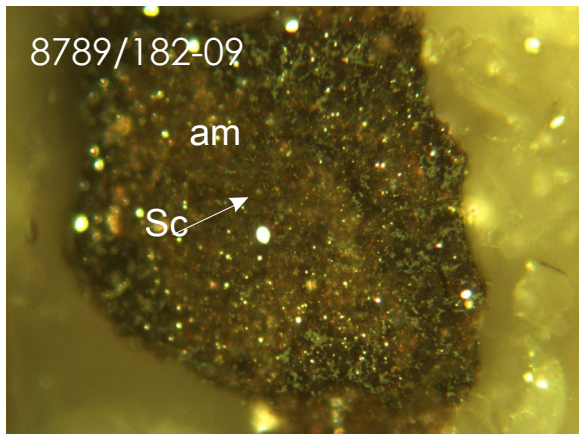
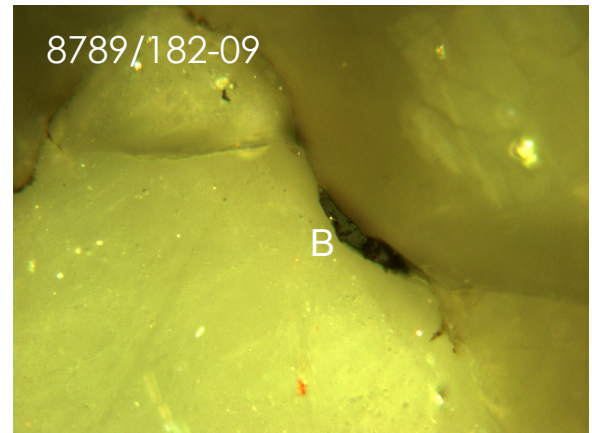
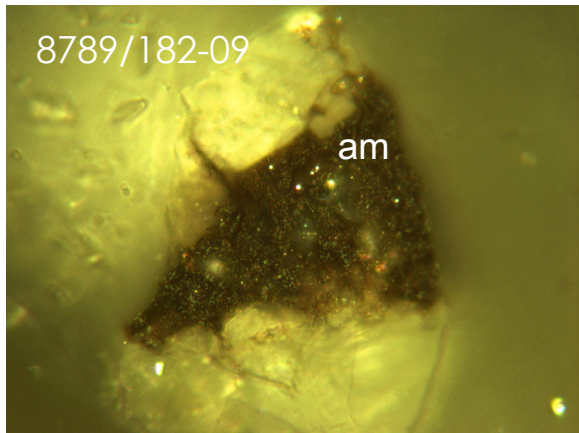
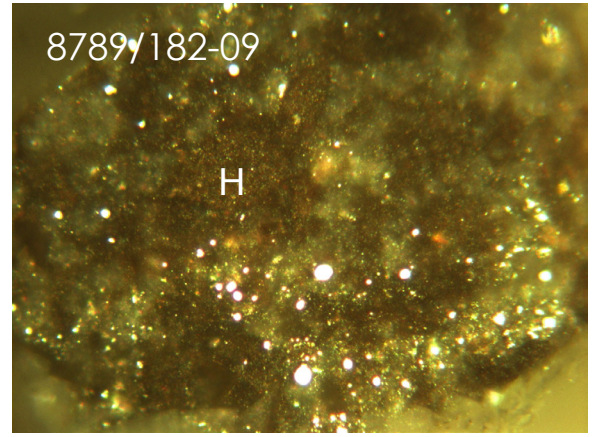
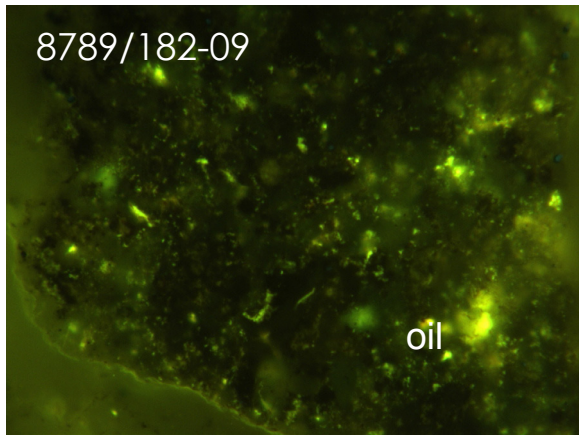
AGS 8789/GSC 182-09 (Montney, 100/13-05-068-01W6/00, 2245.8 m core depth). Coarse-grained siltstone to very fine-grained sandstone with a major amount of hydrocarbon fluid inclusions (hcfi) annealed within carbonate crystals. Minor to rare amount of hebamorphinite (H) and stylocumulates (stylo) between intergranular pores along with isotropic, solid (some granular) bitumen (B) derived from stylocumulates and amorphous kerogen lenses (am). Fracture-filling and pore-filling secondary migrabitumen are most likely derived from the primary bitumen associated with the autochthonous stylocumulates and matrix bitumenite. Siliceous chrysophytes cyst (Sc) microfossils are also observed. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).



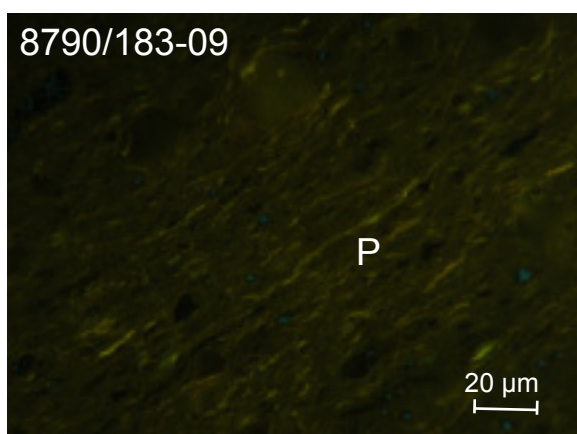
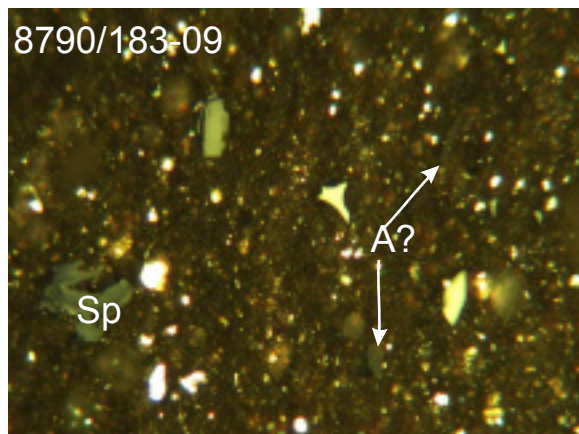
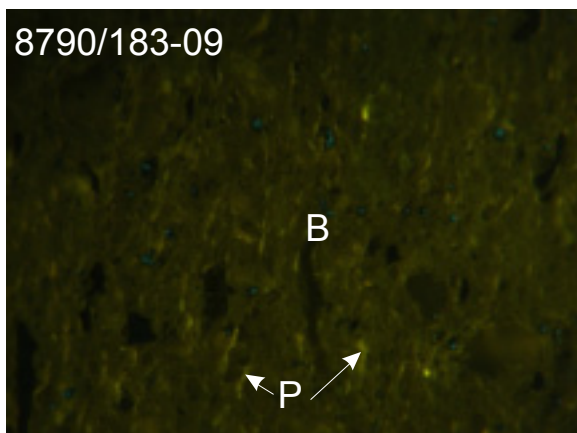
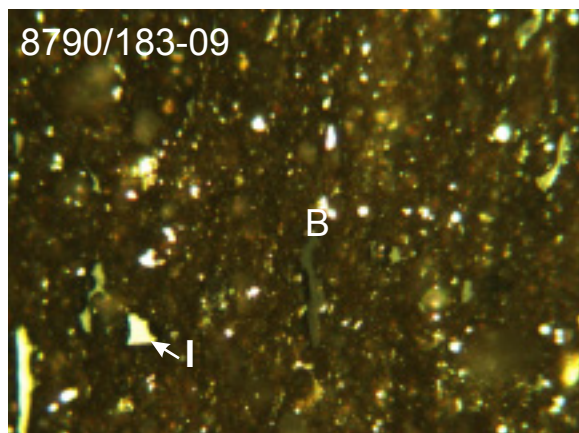
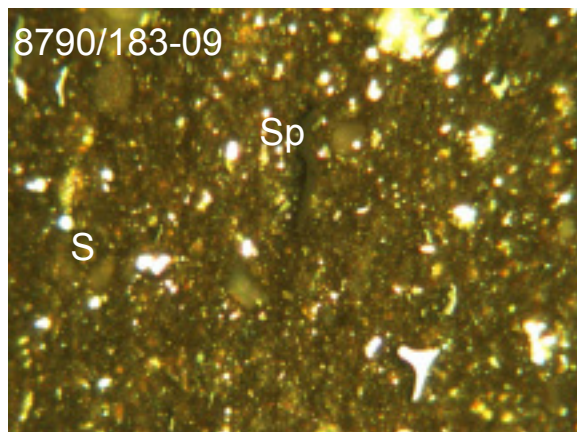
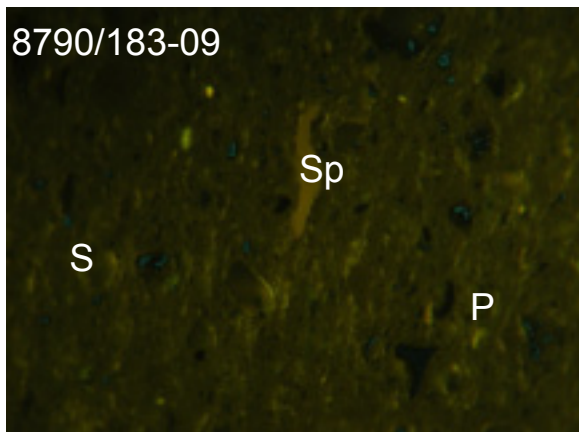




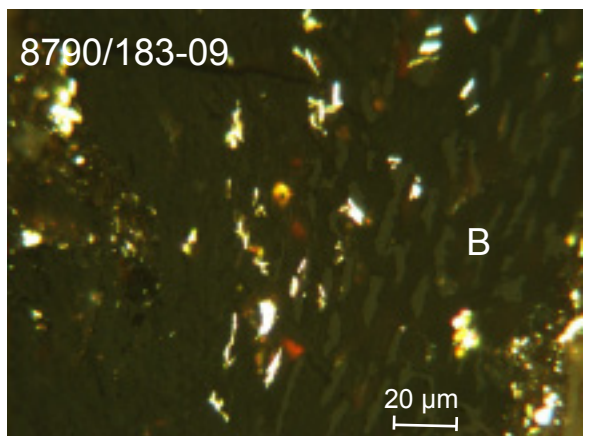
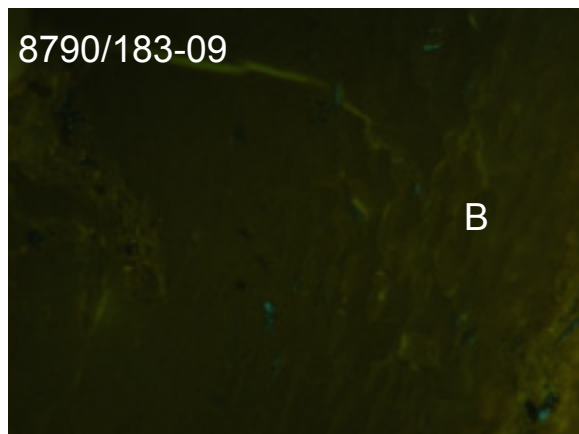
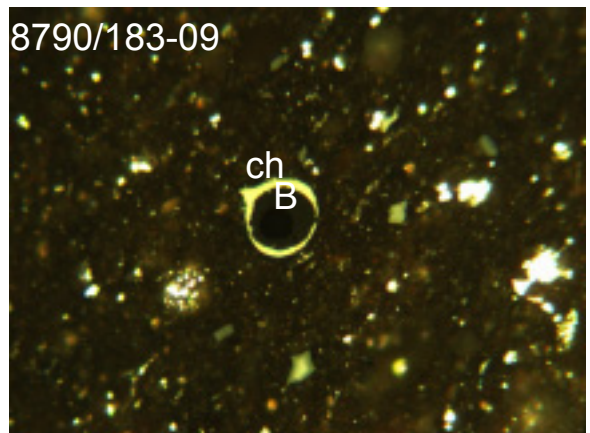
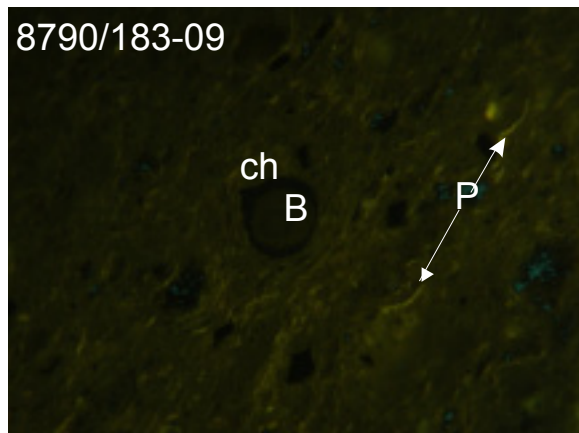
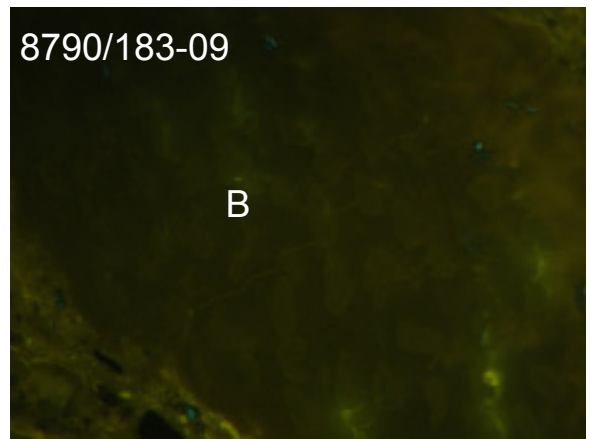
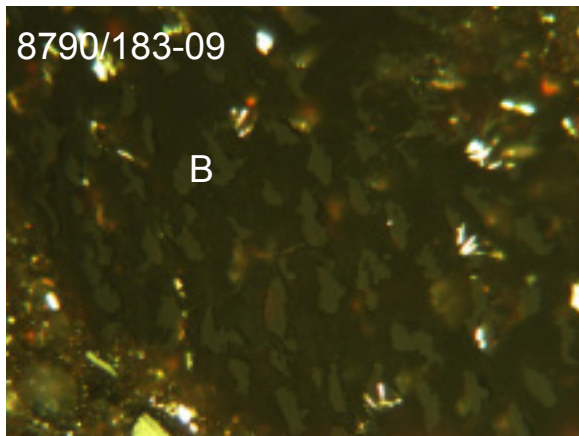




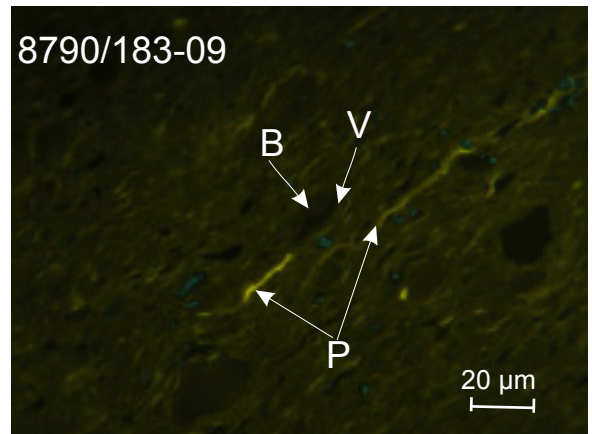
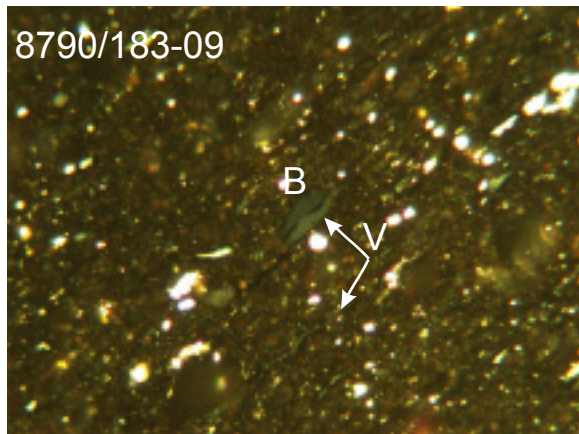
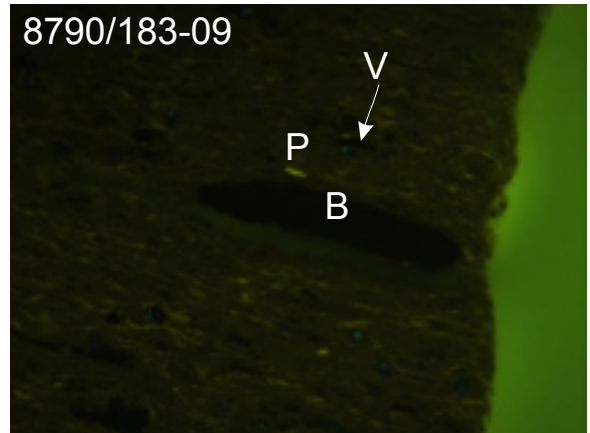
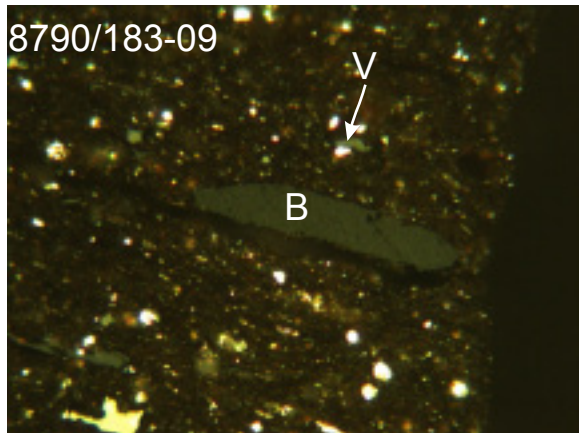
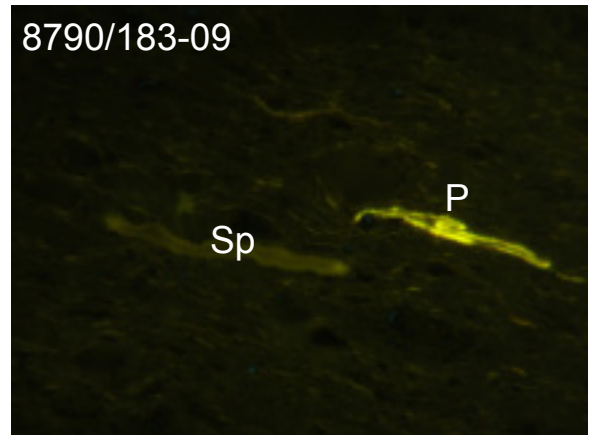
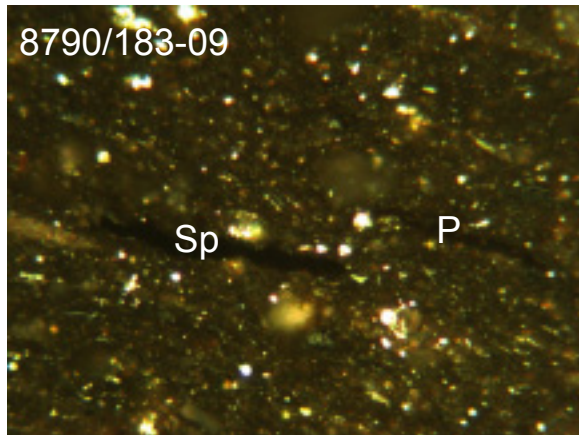




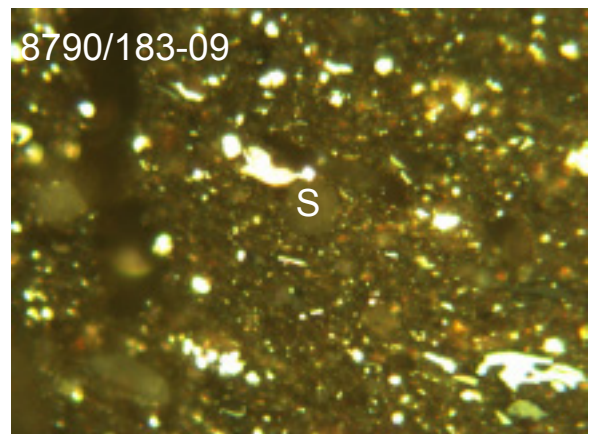
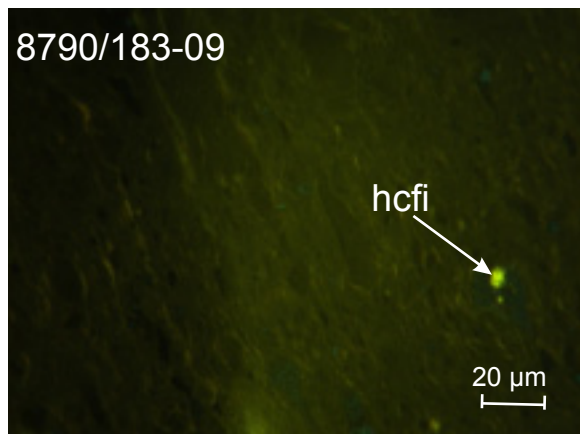
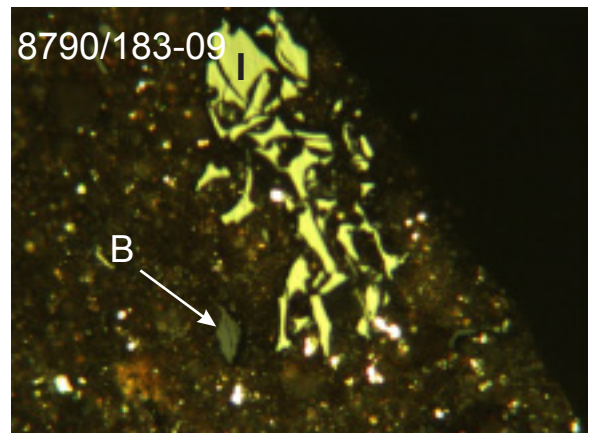
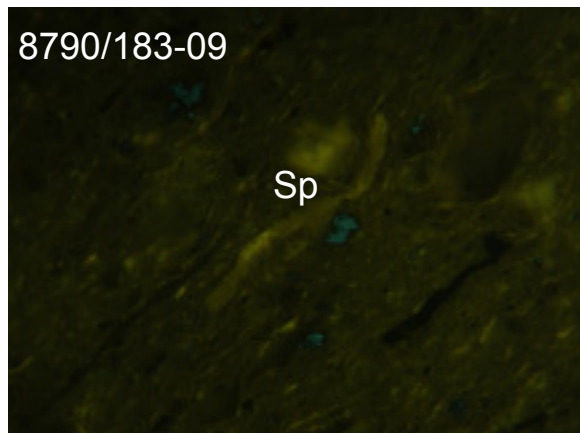
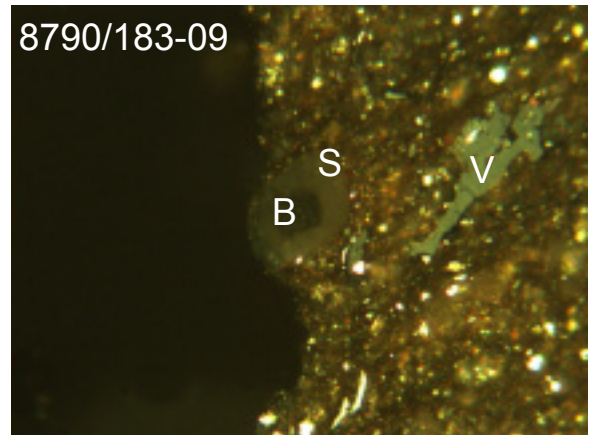
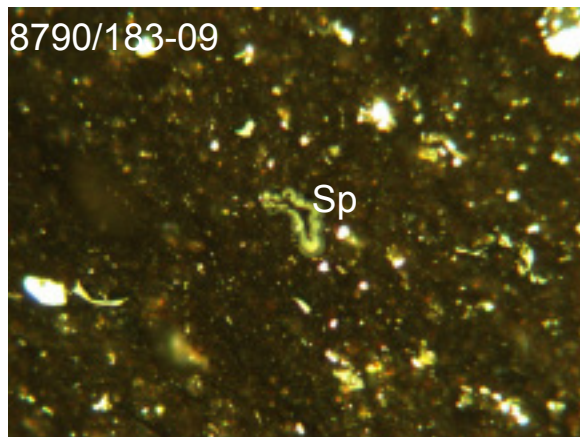
AGS 8790/GSC 183-09 ((Nordegg; 100/13-31-067-18W5/00, 1628.1 m core depth). Dark brown, silty shale with a major amount of Prasinophyte (P) alginite widely dispersed within framboidal, pyrite-rich (Py), amorphous kerogen. Major to minor amount of bright, yellow-fluorescing soluble oil/asphaltine causing greenish-yellow staining due to saturation. Also present is a major amount of reddish-orange fluorescing and non-fluorescing isotropic primary bitumen (B) within intergranular pores and fractures. Trace amount of siliceous (S, probably derived from radiolaria) and chitinous (ch, probably derived from chitinozoans) microfossils filled with reddish-brown fluorescing solid bitumen. Trace non-fluorescing sporinite (Sp) and alginite (A). Rare allochthonous inertinite maceral. V = vitrinite. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

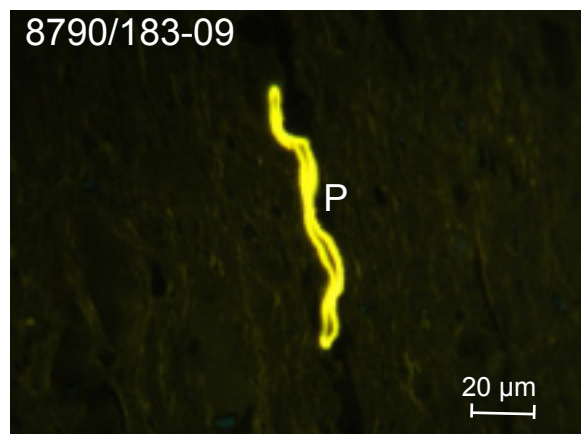
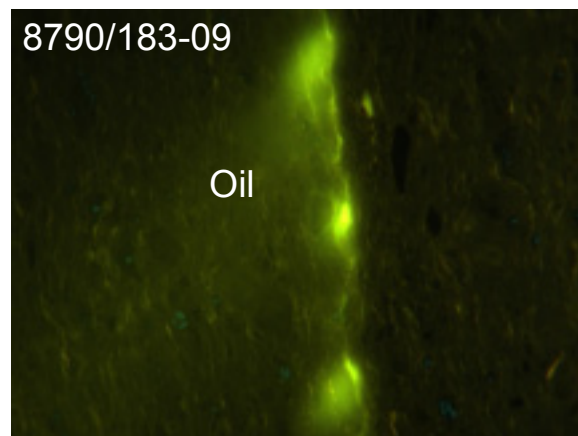
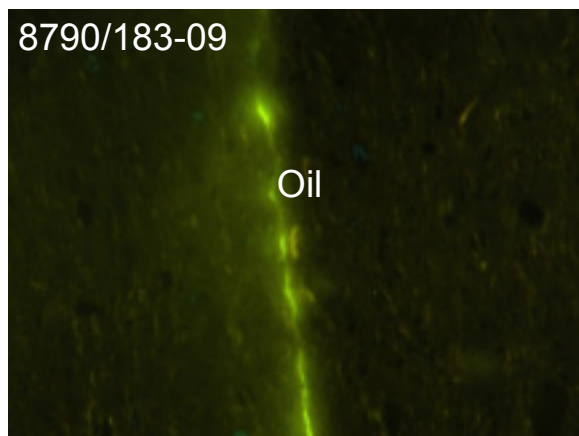


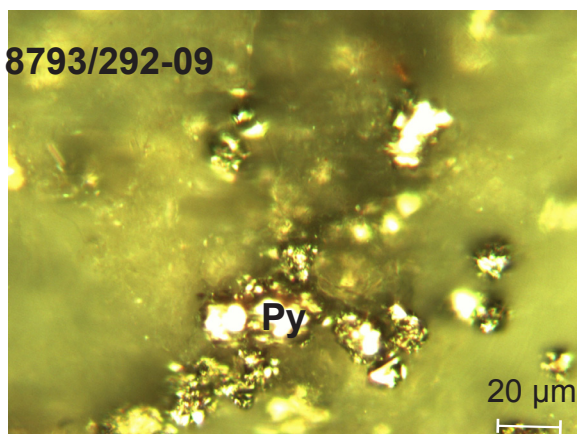
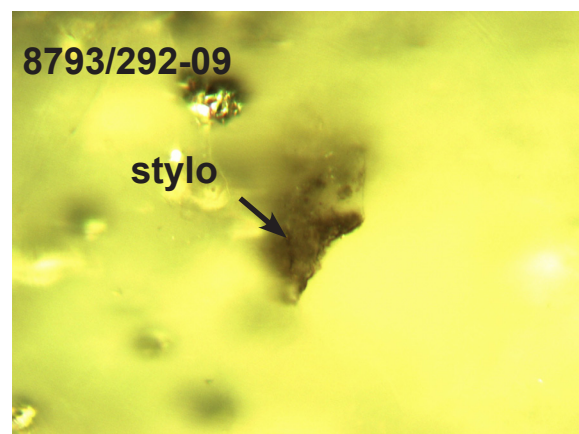
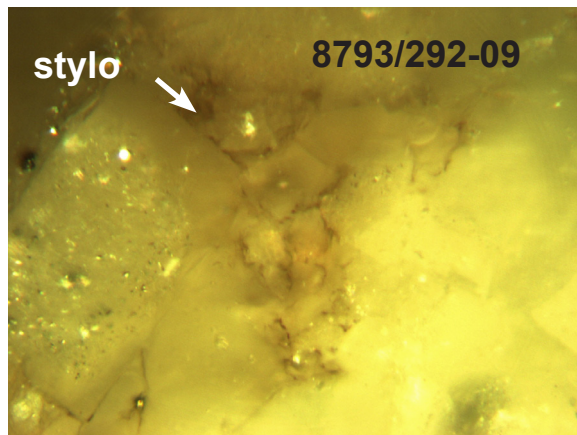
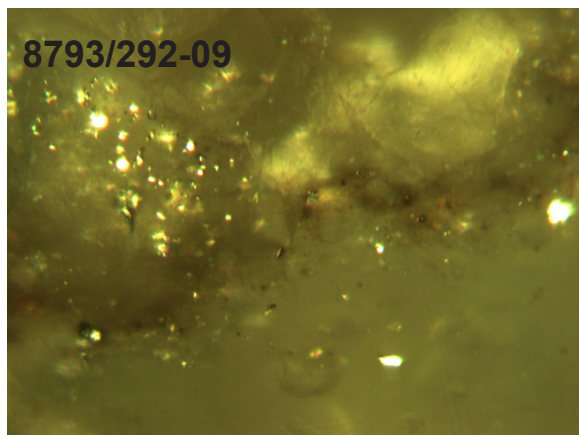






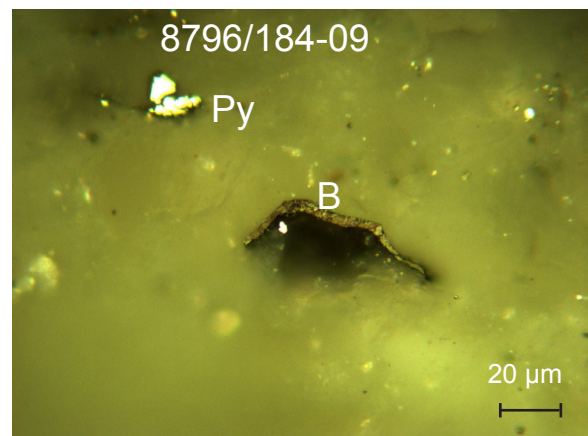
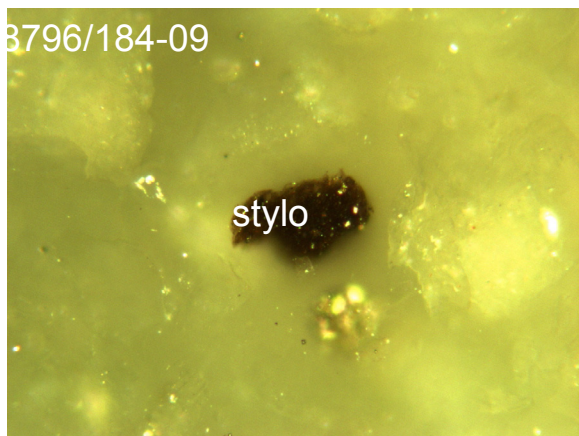
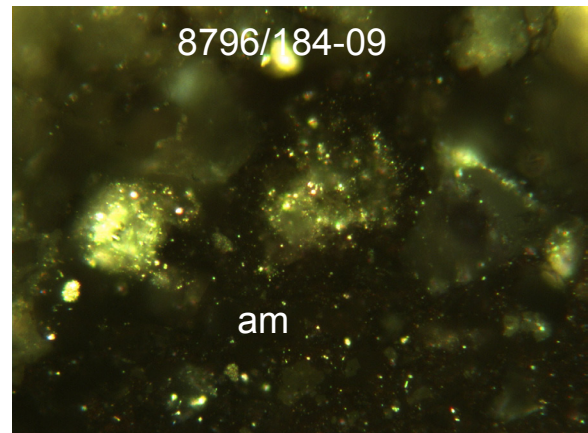
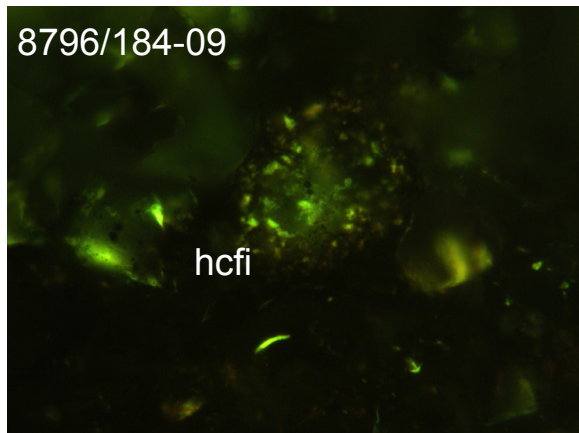
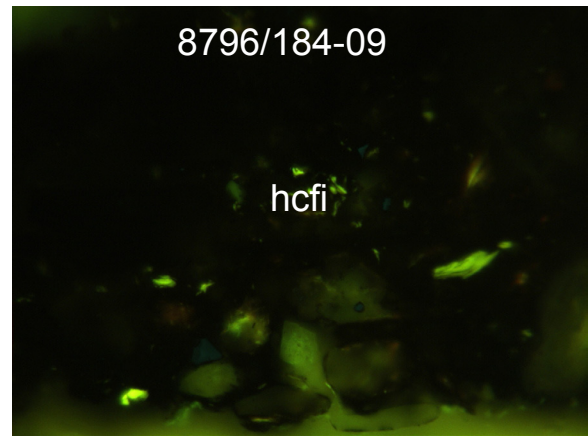
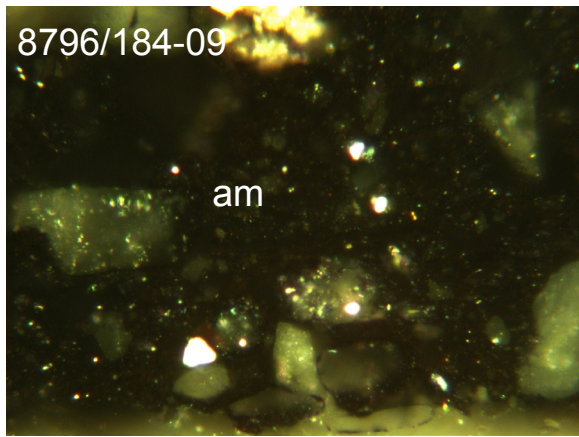




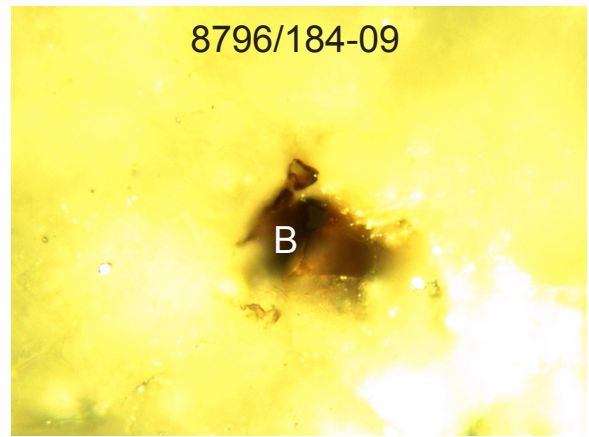


AGS 8793/GSC 292-09 (Montney; 100/13-31-067-18W5/00, 1665.9 m core depth). Organically lean, carbonate-dominated siltstone with a rare amount of mainly framboidal pyrite (Py) and a trace amount of thin, brown lenses of stylocumulates (stylo). No trace of fluorescing organic matter observed. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50x magnification).

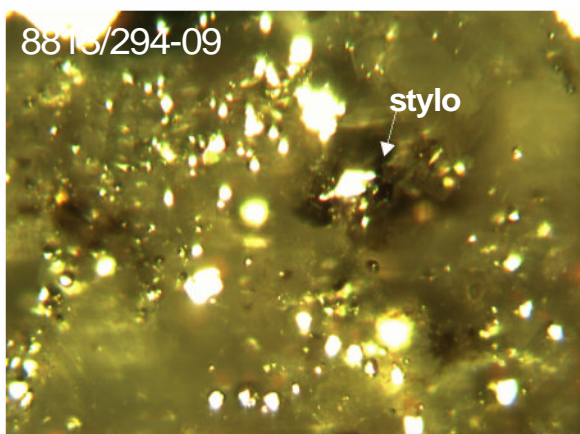
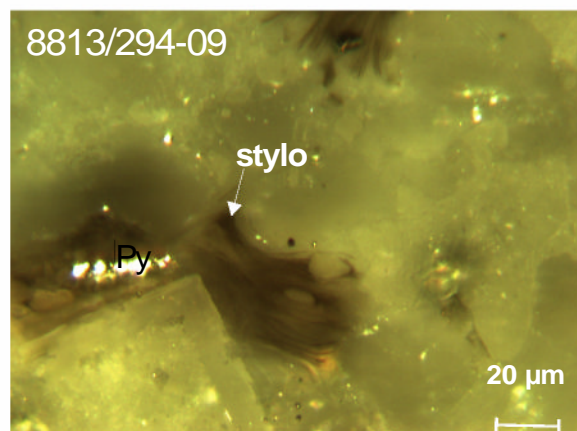
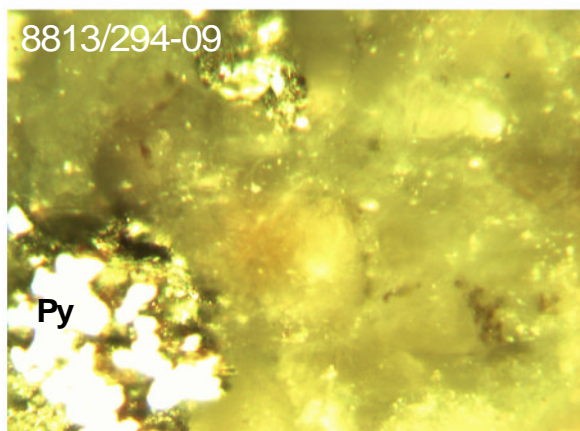
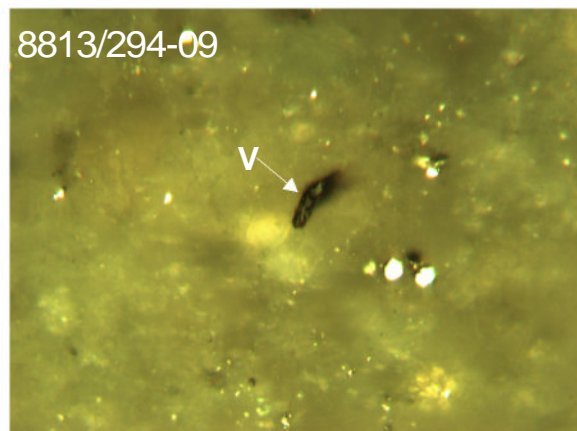
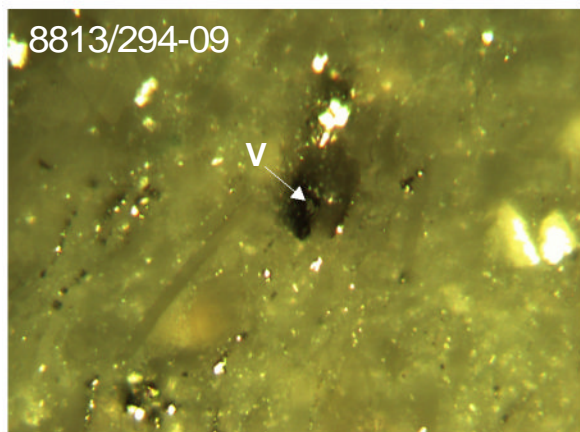




AGS 8796/GSC 184-09 (Montney; 102/14-20-079-22W5/00, 866.6 m core depth). Coarse-grained siltstone to very fine grained sandstone with a major amount of hydrocarbon fluid inclusions (hcfi) within carbonate crystals. Rare amount of stylocumulates (stylo) and amorphous kerogen (am) between intergranular pores. Trace of granular solid bitumen (B) derived from stylocumulates and amorphous kerogen lenses. Fracture-filling and pore-filling secondary migrabitumen are most likely derived from the primary bitumen associated with the autochthonous stylocumulates and matrix bitumenite. Possible siliceous chrysophytes cyst microfossils are also observed. Py = pyrite. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

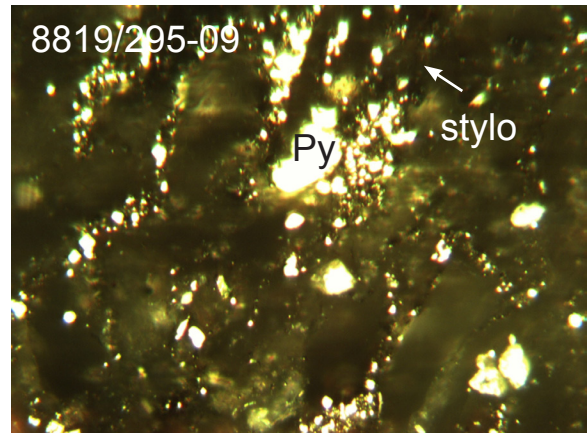
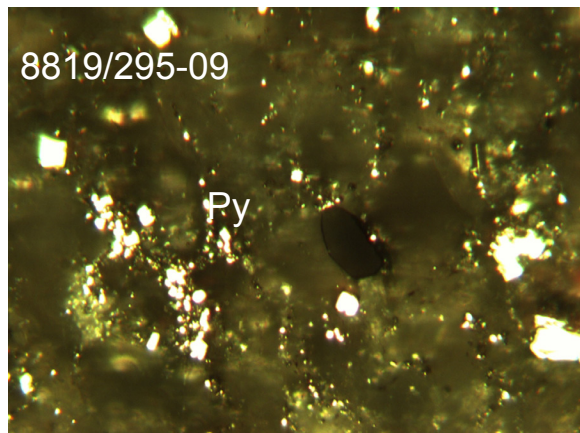
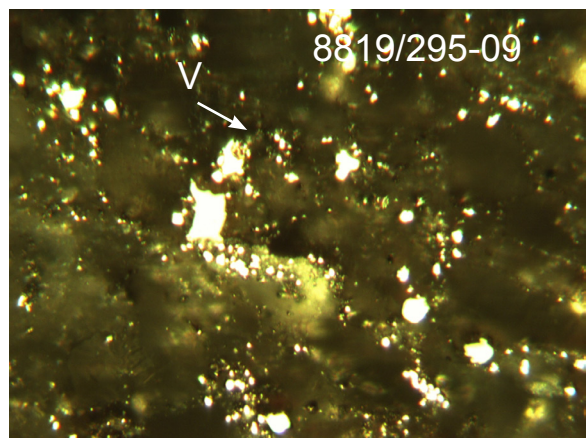
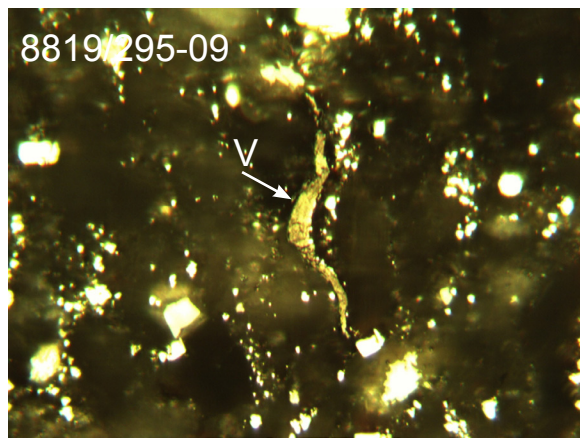




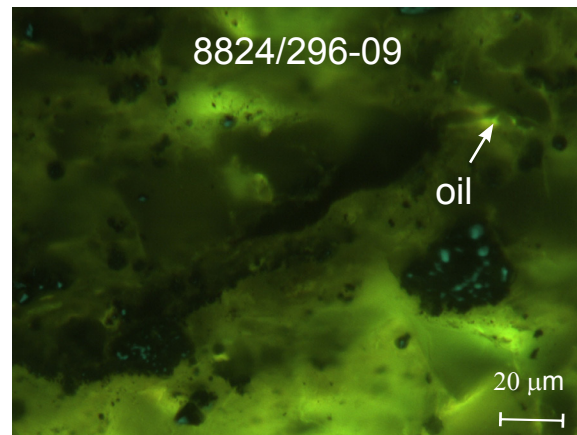
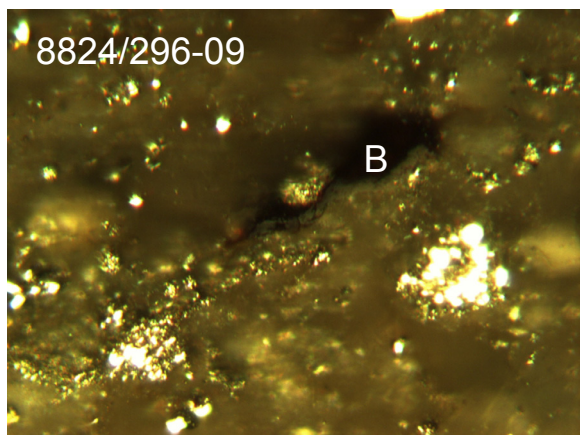
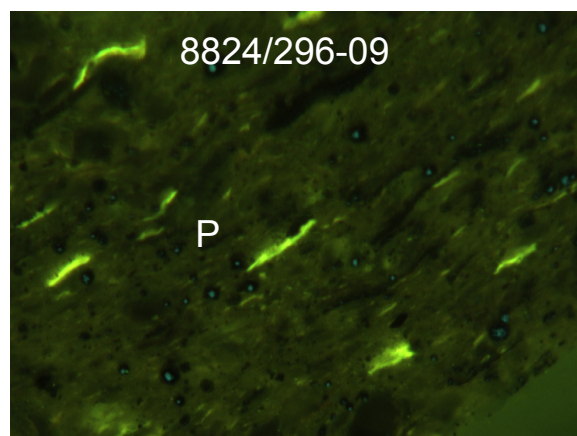
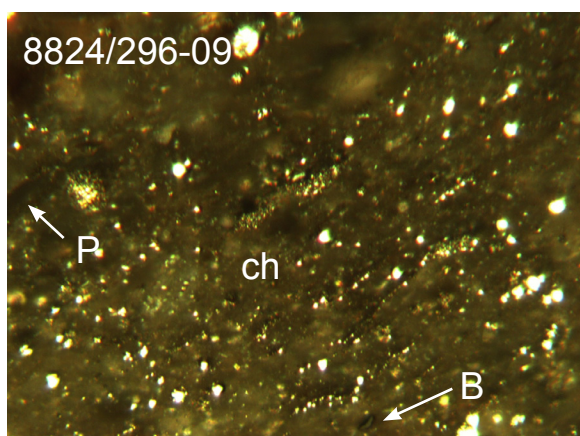
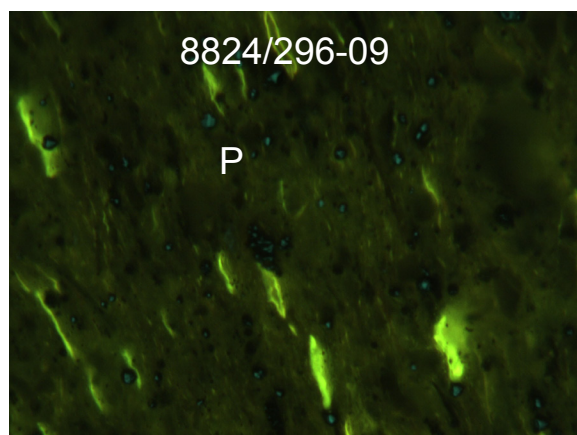
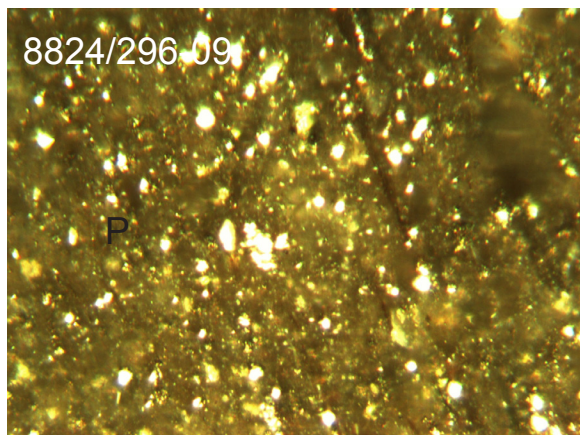


AGS 8813/GSC 294-09 (Montney; 100/04-06-059-20W5/00; 2656.4 m core depth) Organically lean, carbonate-dominated siltstone with mainly pyrite (Py) crystals, a trace amount of very small, alginite-derived vitrinite (V) particles, and thin brown lenses of stylocumulates (stylo). No fluorescing organic matter observed. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).



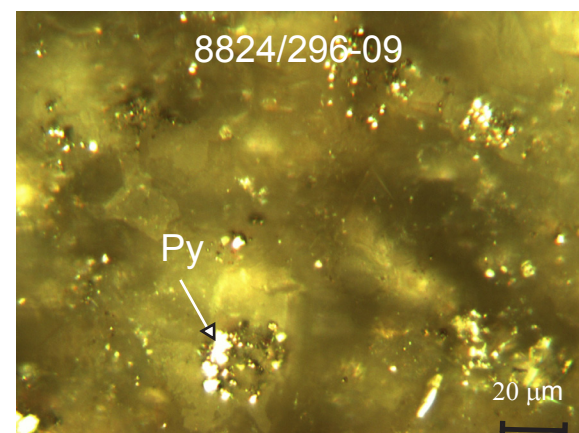
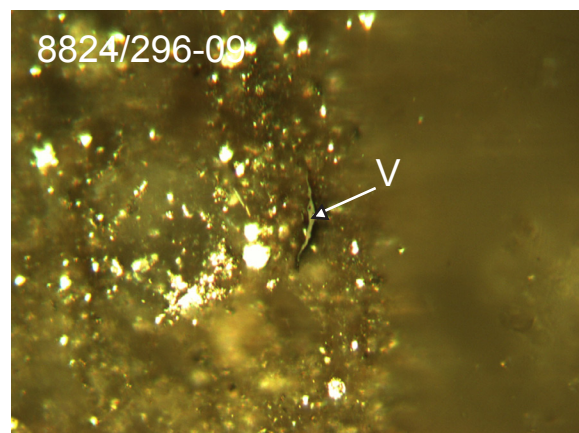
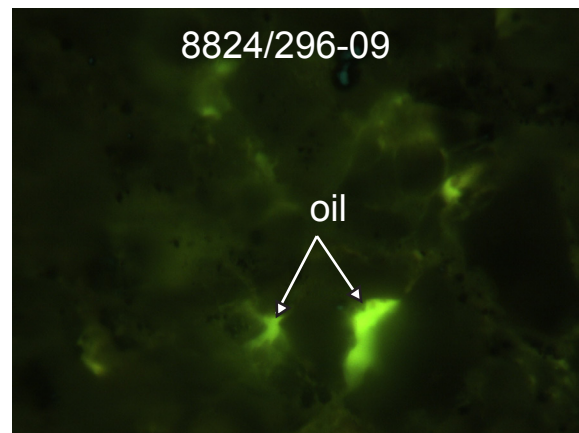
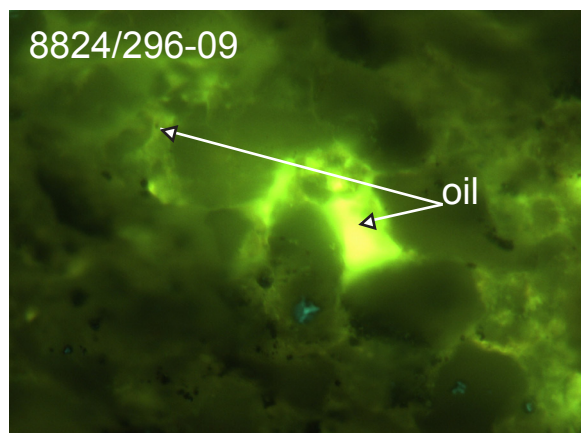
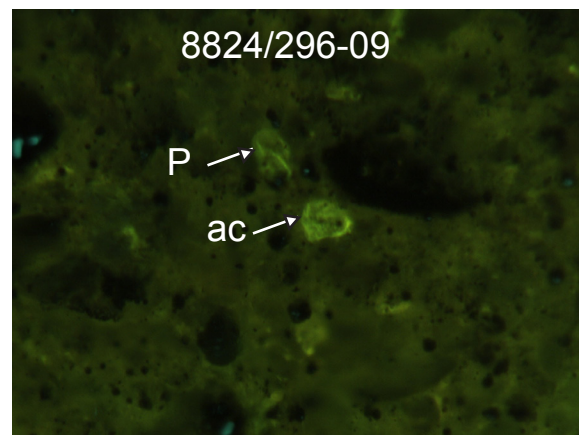
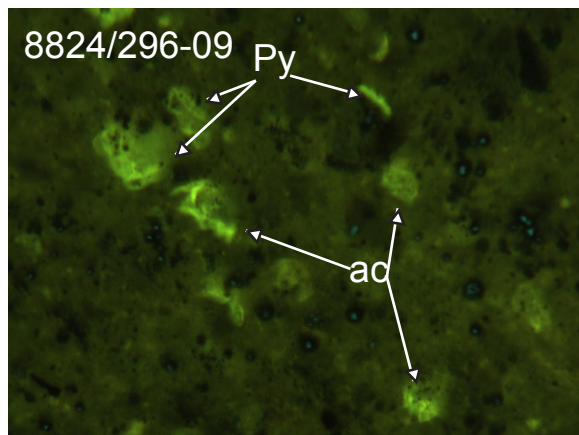


AGS 8819/GSC 295-09 (Montney; 100/11-14-057-23W5/0, 3013.3 m core depth). Organically lean, carbonate-dominated siltstone with a major amount of mainly framboidal pyrite (Py) between carbonate grains and a trace amount of very small sulphid rich anisotropic alginite-derived vitrinite (V) particles and thin brown lenses of stylocumulates (stylo). No trace of fluorescing organic matter observed. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

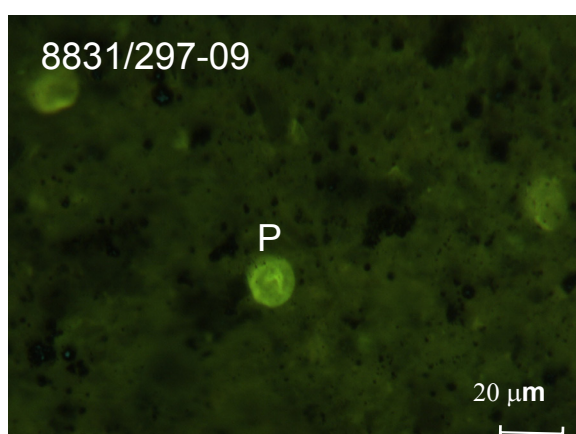
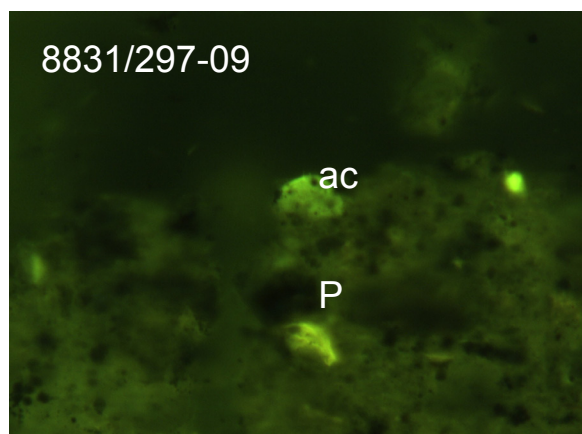
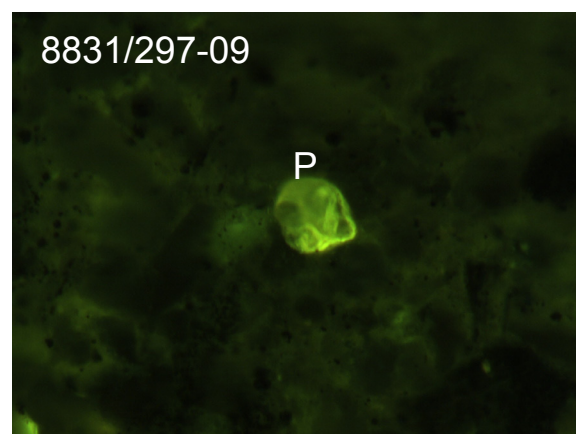
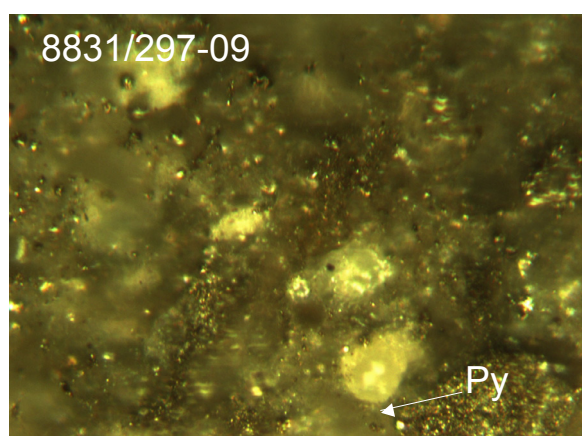
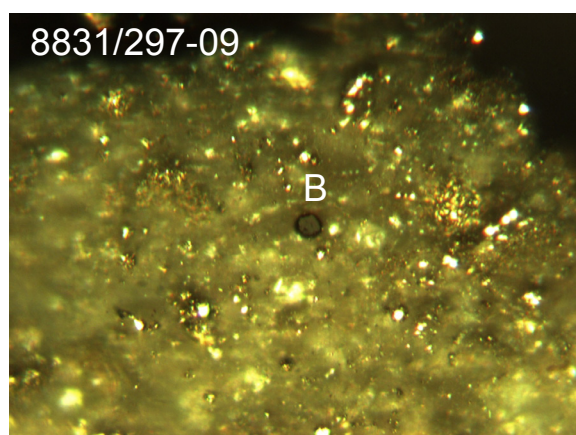
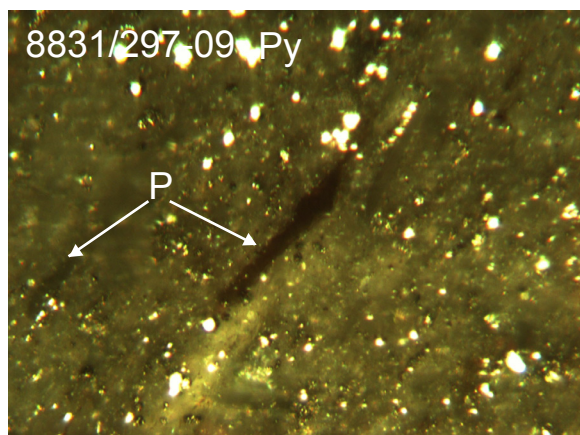


AGS 8824/GSC 296-09 (Montney; 100/06-33-072-25W5/0; 1595.5m core depth). Alginite and pyrite-rich (Py), greenish, silty shale with mostly non-fluorescing, brown alginite lenses to greenish-yellow fluorescing Prasinophyte (P), and acanthomorphic spiny acritarch (ac) in an organically-lean siltstone matrix. Trace amount of oil stain (oil) possibly migrating from the organic-rich silty shale. Rare amount of vitrinite (V) and bitumen (B) lenses. %Ro may be slightly suppressed due to staining. ch = chitin. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

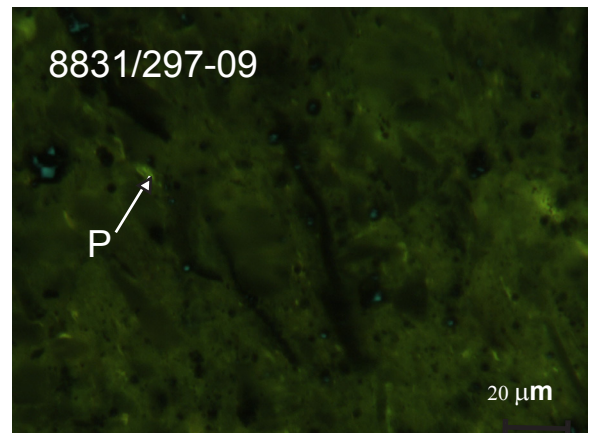
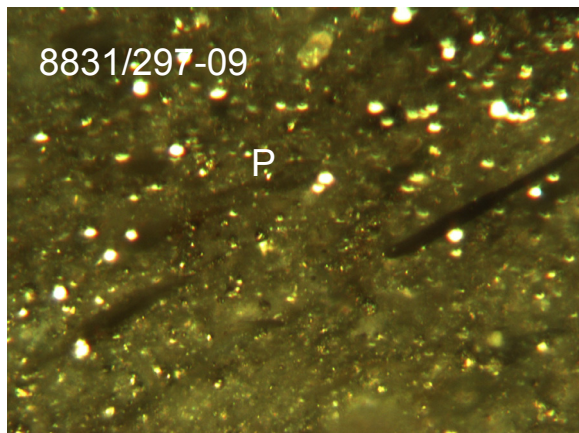
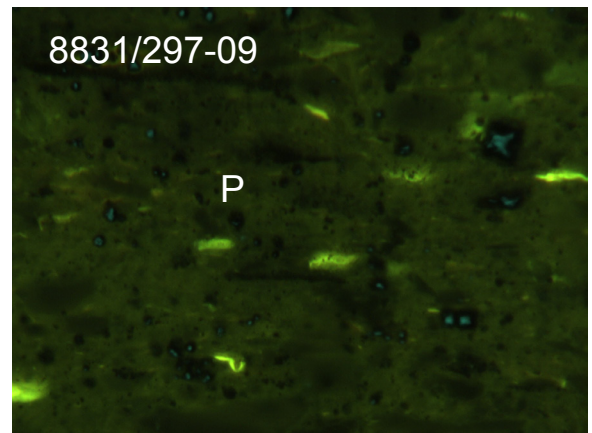
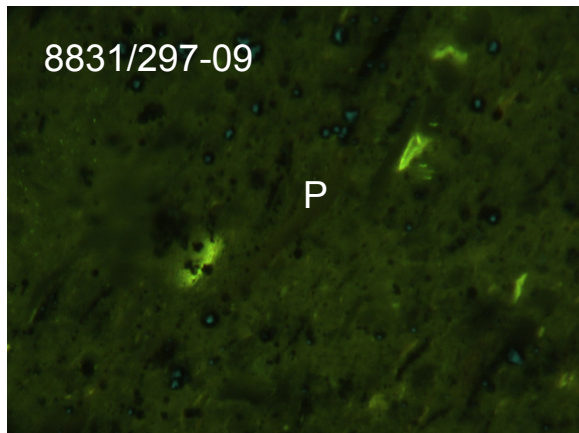
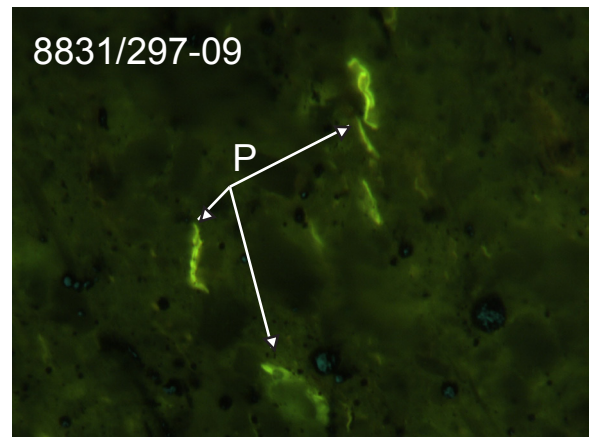
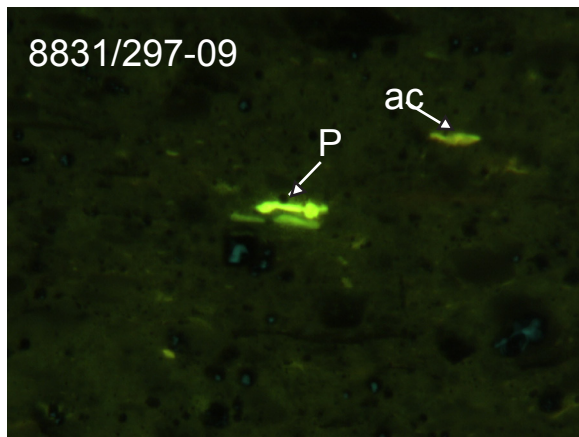




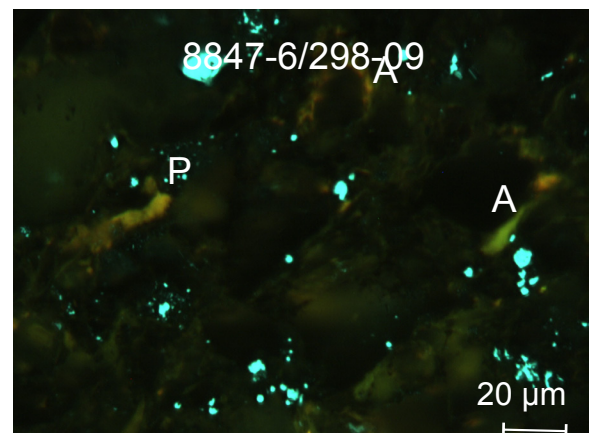
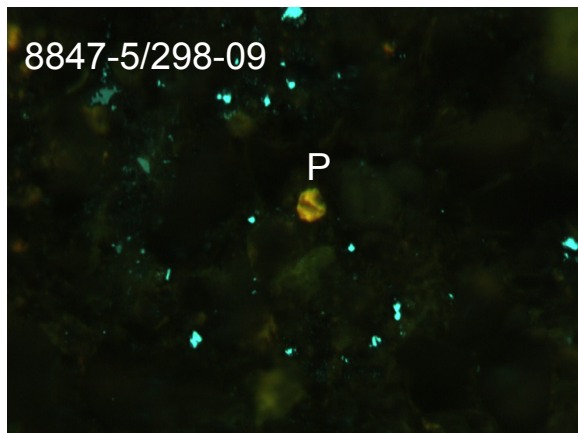
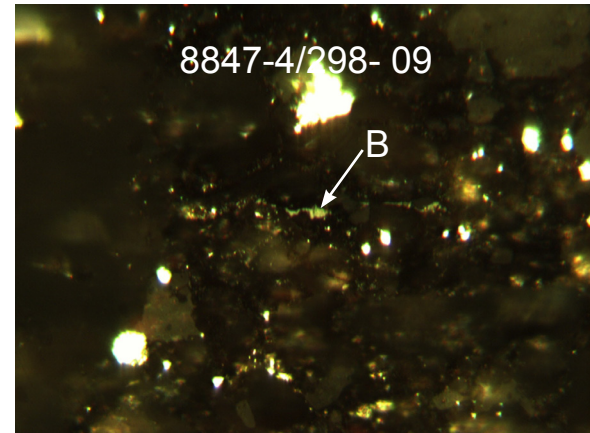
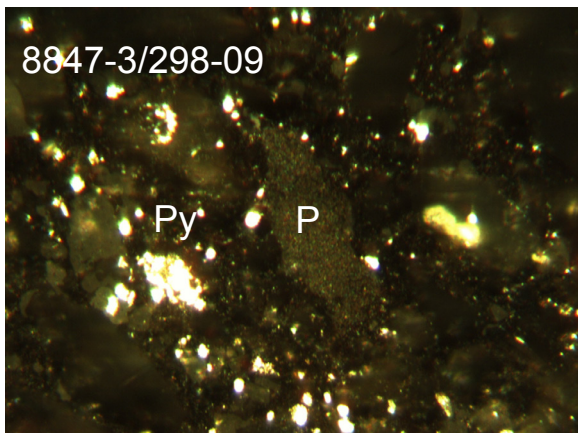
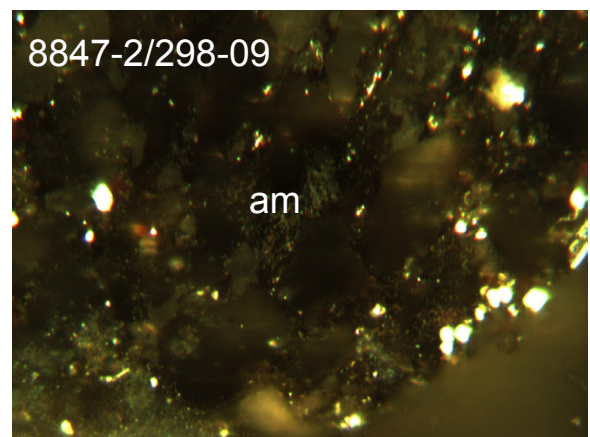
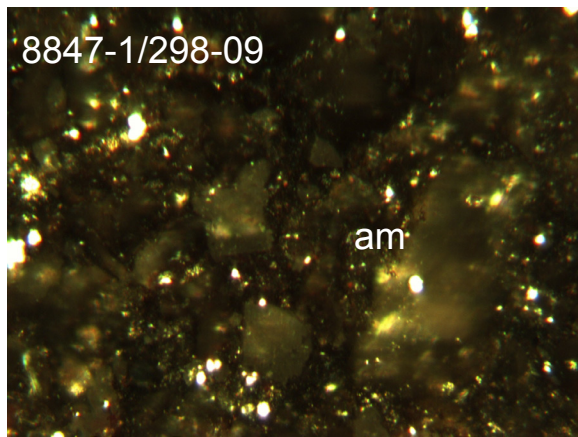




AGS 8831/GSC 297-09 (Montney; 100/06-34-072-25W5/0, 1542.5 m core depth). Pyrite-rich (Py), organically-lean greenish, silty shale with a minor amount of yellow fluorescing Prasinophyte (P) alginite and acanthomorphic spiny acritarch (ac), and a rare amount of measureable, alginite-derived vitrinite (V) and bitumen (B) lenses. R = Radiolaria. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

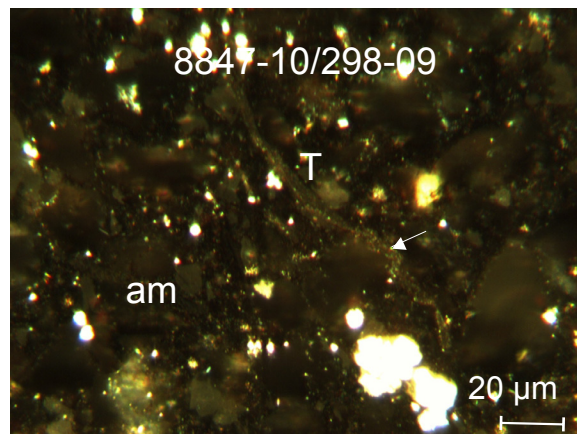
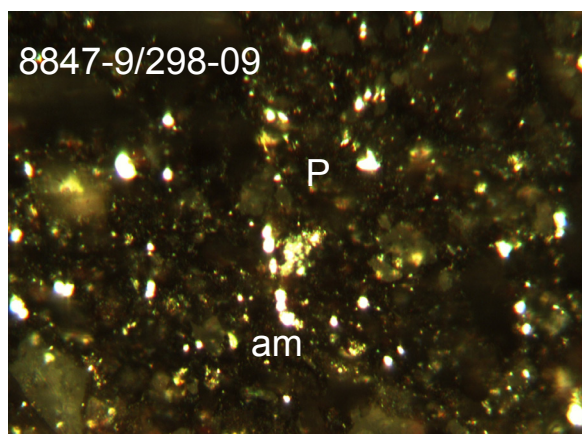
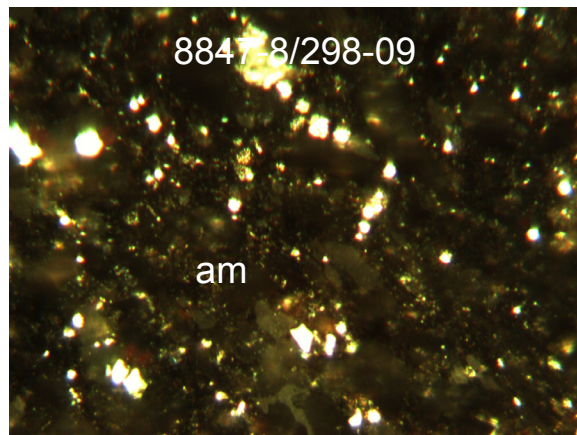
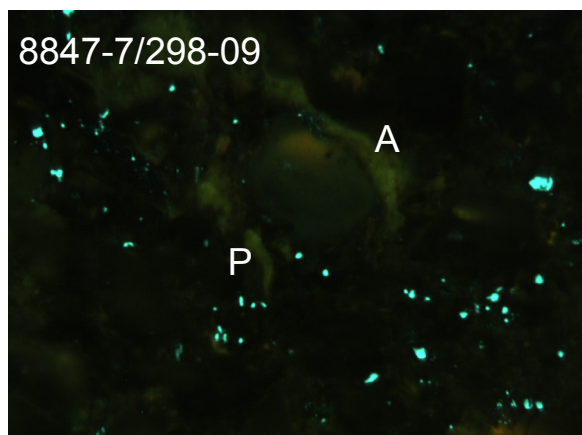


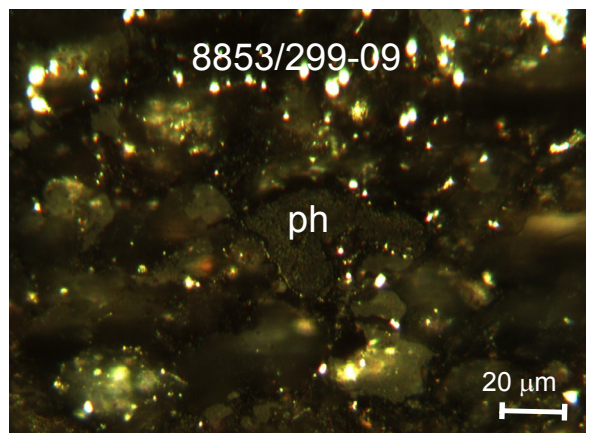
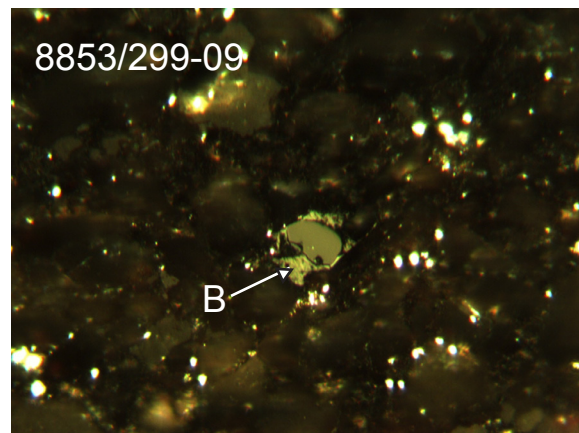
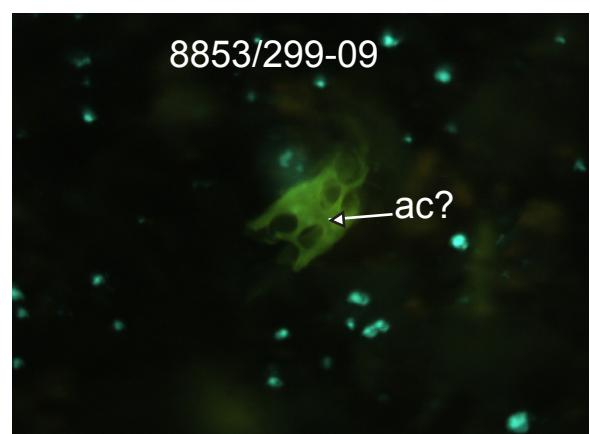
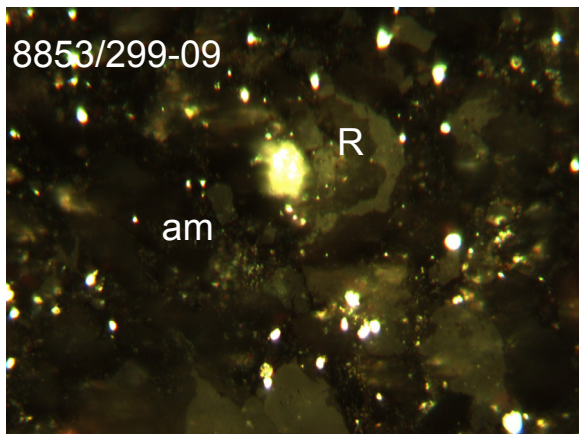
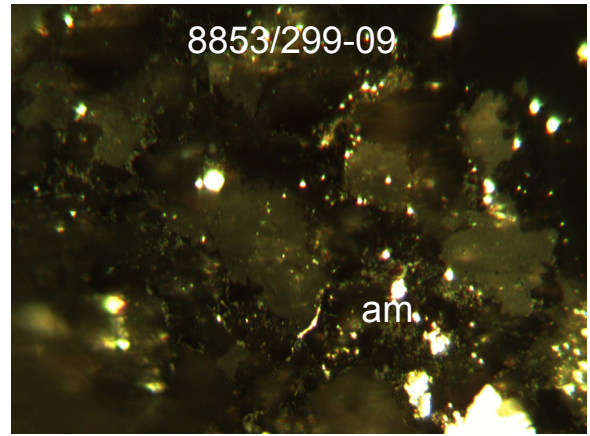
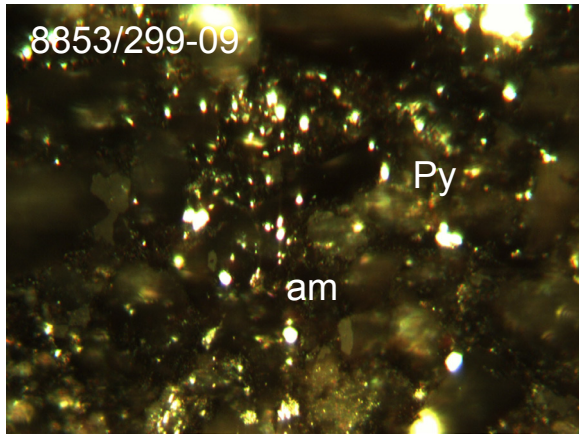




AGS 8847/GSC 298-09 (Montney; 100/16-23-057-06W6/0, 8683 ft. core depth). Organic-rich black, silty shale comprised mostly of an interconnected network of spent kerogen (am = amorphous kerogen) with a high degree of micritite inclusions. Very rare vitrinite (V) or bitumen (B) lenses with a rare amount of orange fluorescing *Prasinophyte* (P), *Tasmanites* sp ((T), non fluorescing with micritite inclusion, see arrow 8847-10) and alginite-derived orange fluorescing kerogen brecciated between a fine-grained carbonate matrix. Py = Pyrite, A = Alginite. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

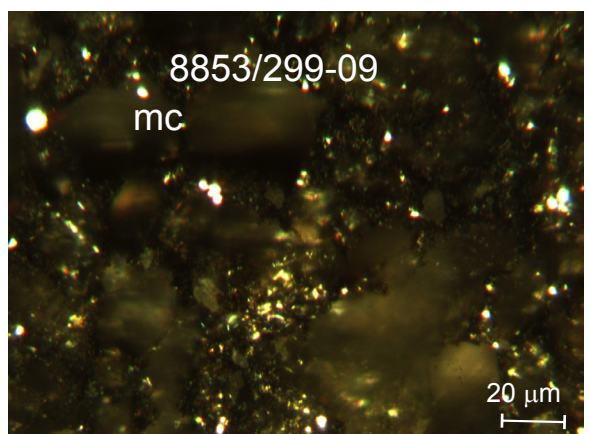
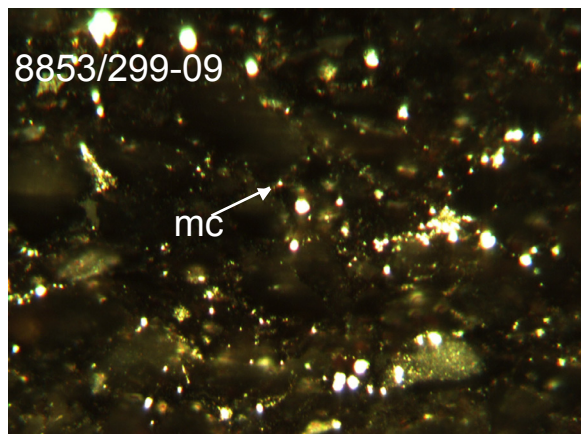
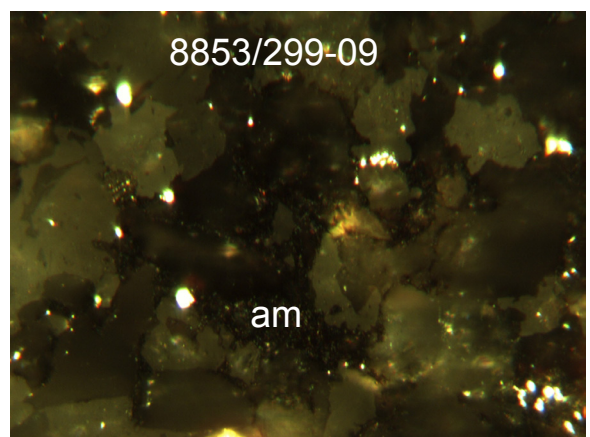
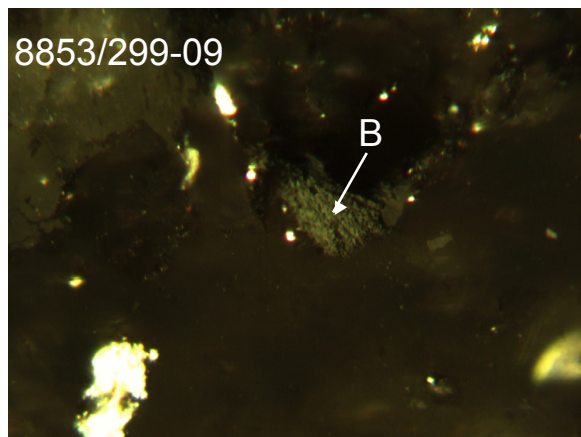




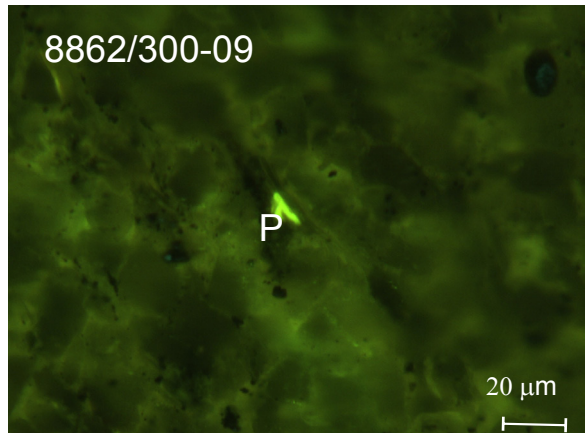
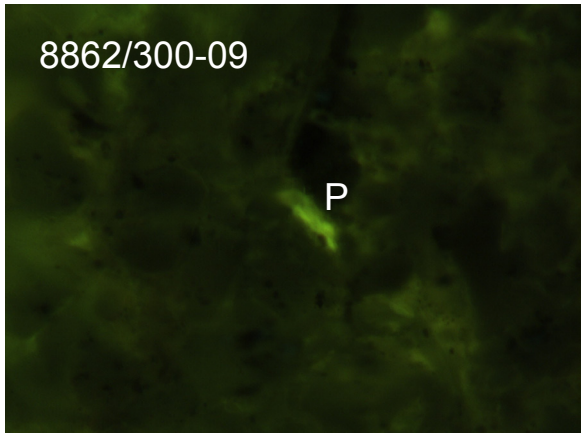
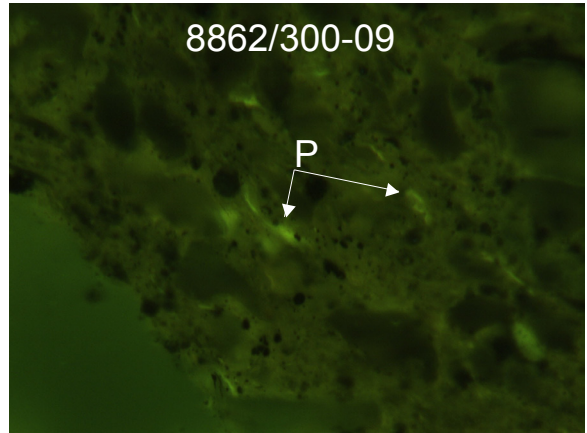
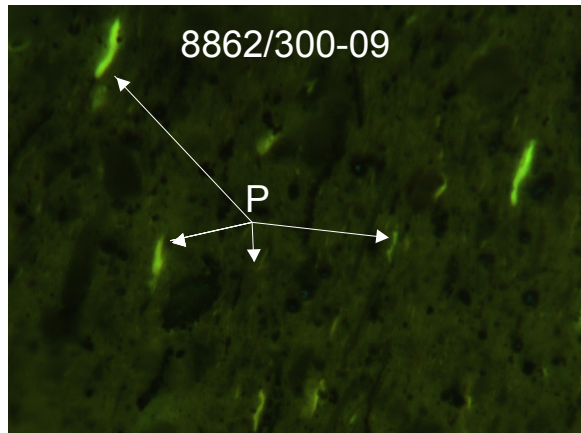
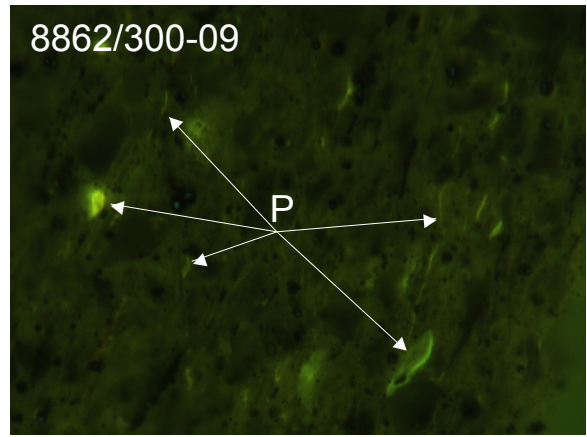
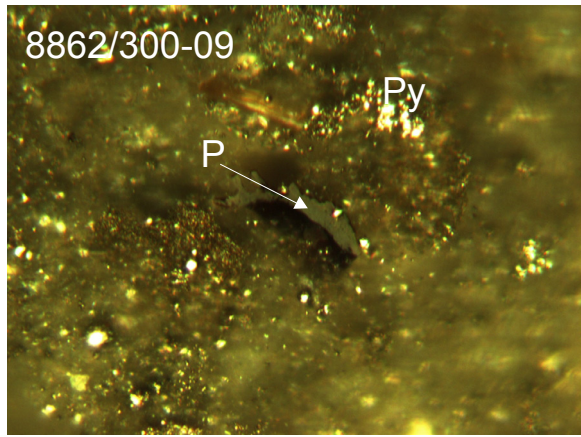


AGS 8853/GSC 299-09 (Montney; 100/16-23-057-06W6/00, 8824 ft.core depth). Organic-rich, black, silty shale consisting mostly of an interconnected network of spent kerogen (am = amorphous kerogen) with micrinite (mc) inclusions. Very rare vitrinite (V) or bitumen (B) lenses and thin orange fluorescing alginite lenses in a very fine-grained siltstone matrix. Trace amount of phosphatic nodules (ph), radiolaria (R) and fluorescing acritarch (ac). Py = pyrite. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

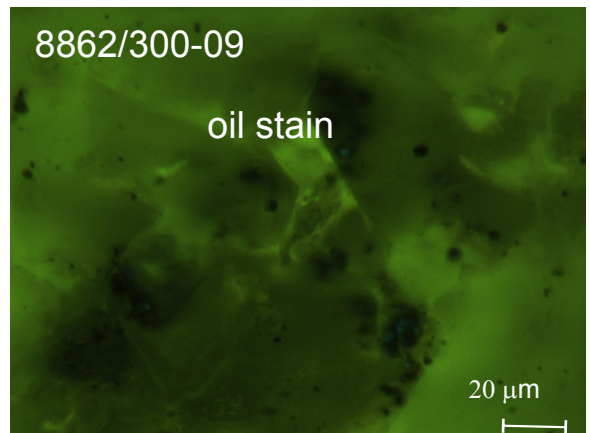
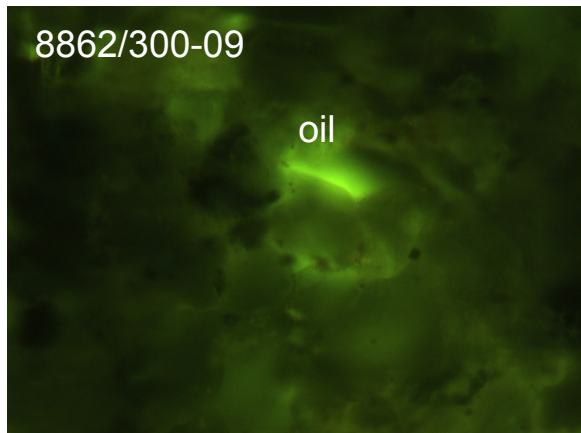
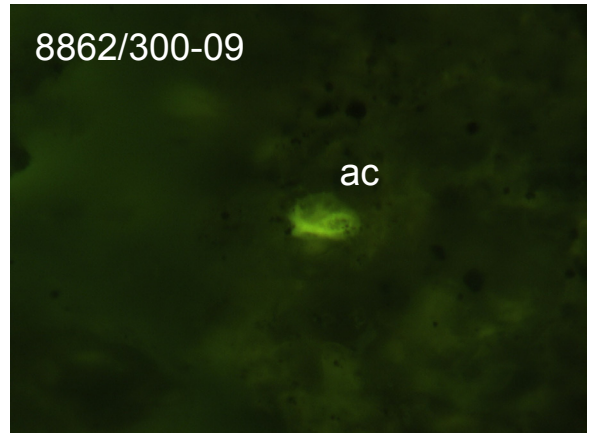
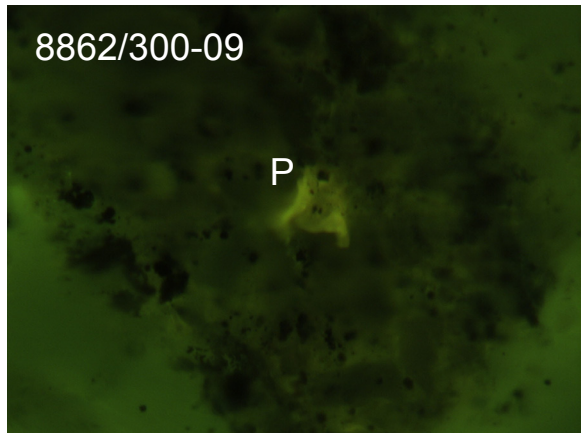
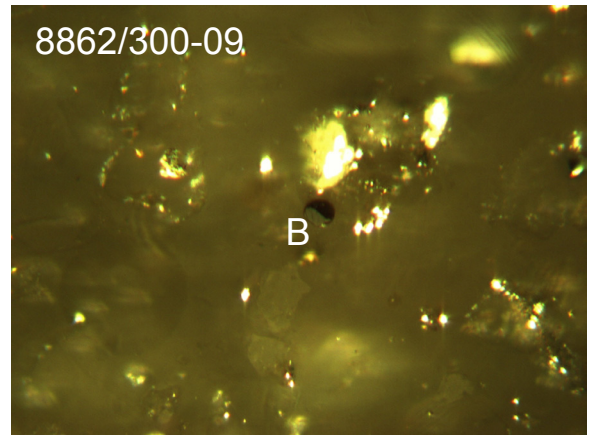
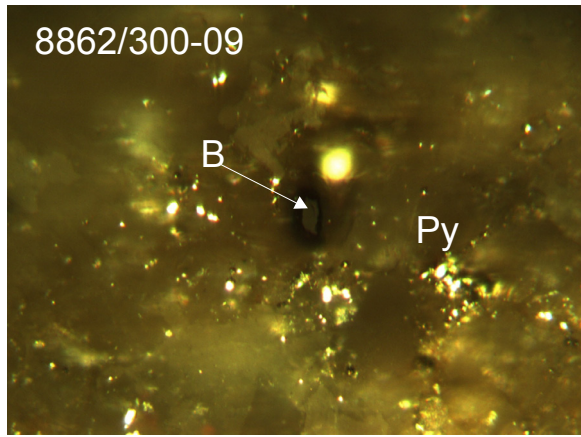




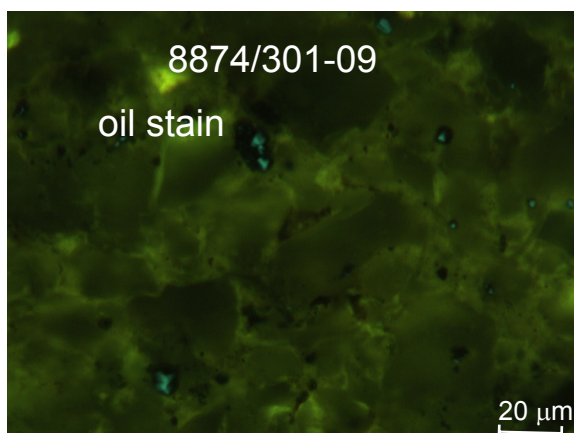
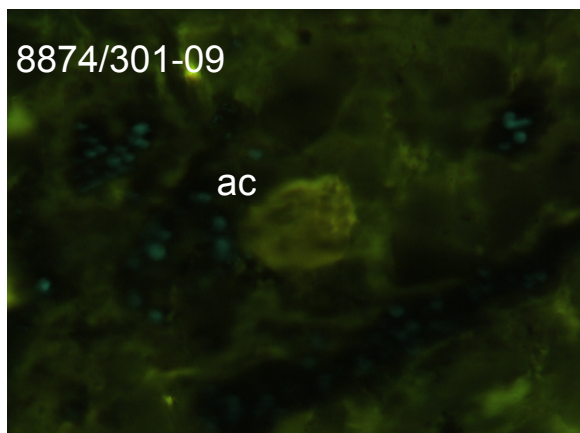
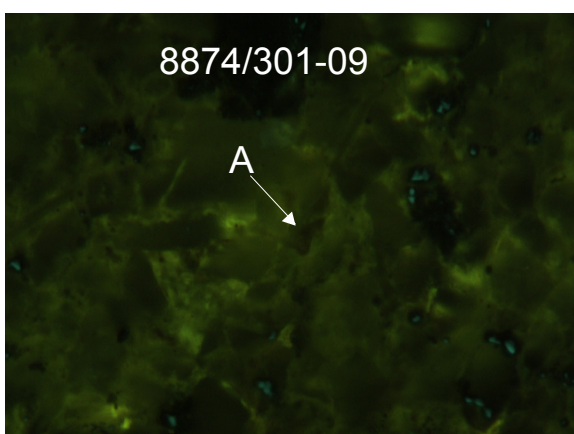
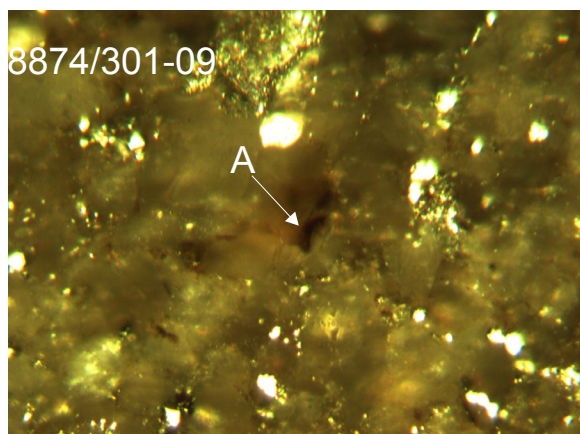
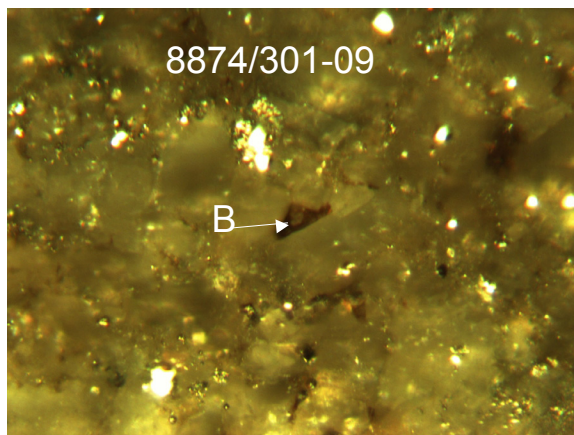
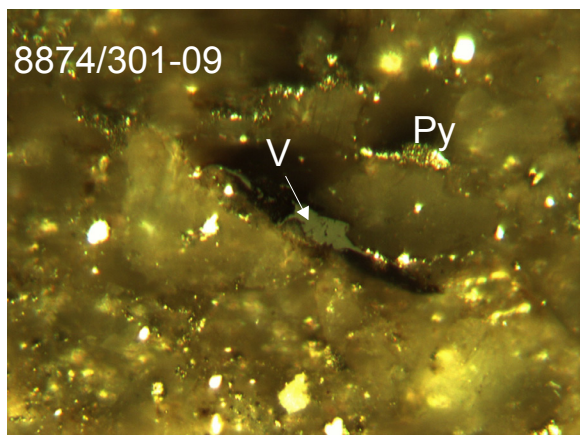




AGS 8862/GSC 300-09 (Montney; 102/11-34-078-02W6/00, 1779.9m core depth). Pyrite-rich (Py), organically-lean greenish, silty shale with a minor amount of yellow fluorescing Prasinophyte (P) alginite, and acanthomorphic spiny acritarch (ac). Rare amount of measureable vitrinite (V) and bitumen (B) lenses. There are also traces of soluble oil (oil) and oil stain (oil stain) found between intergranular pores. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

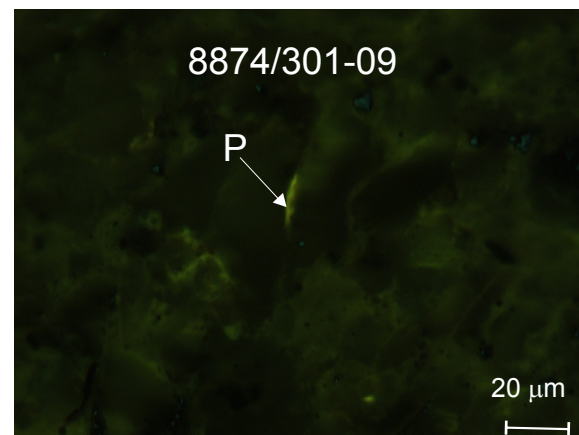
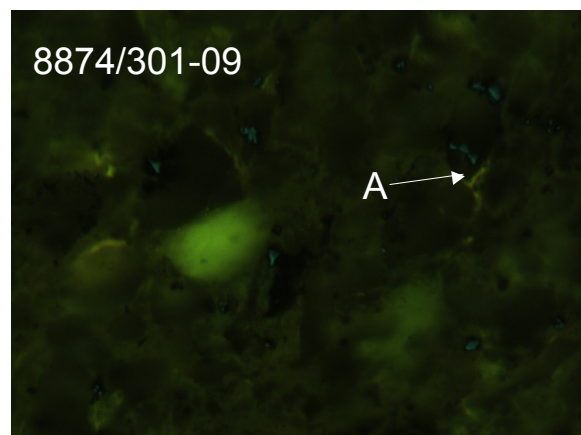
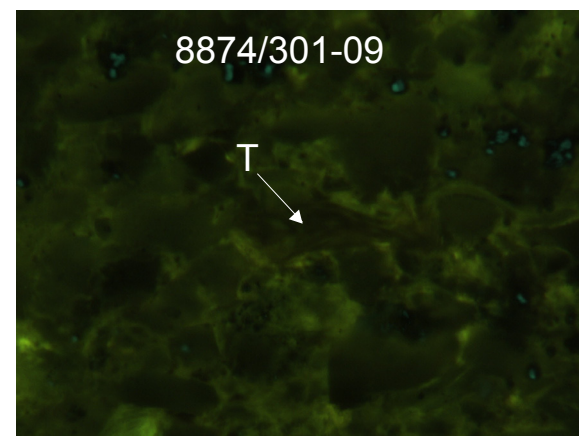
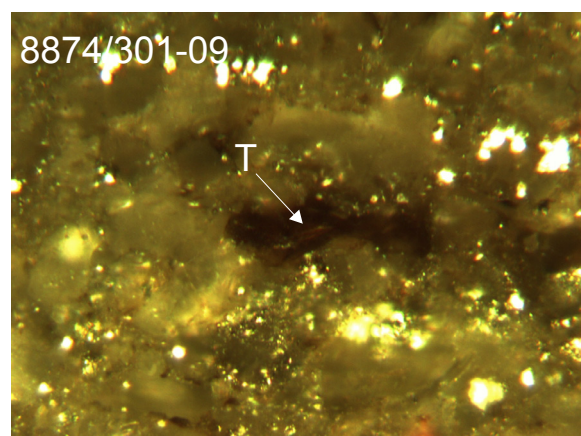
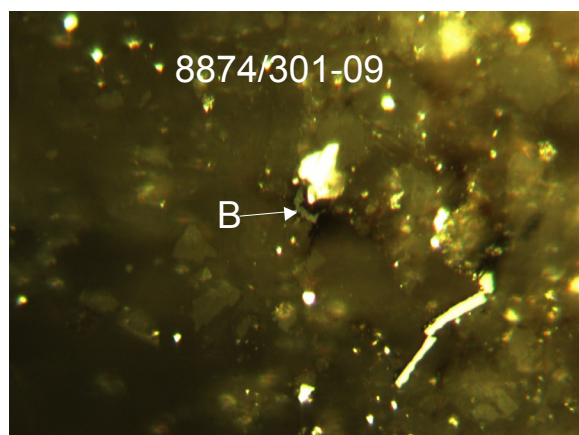
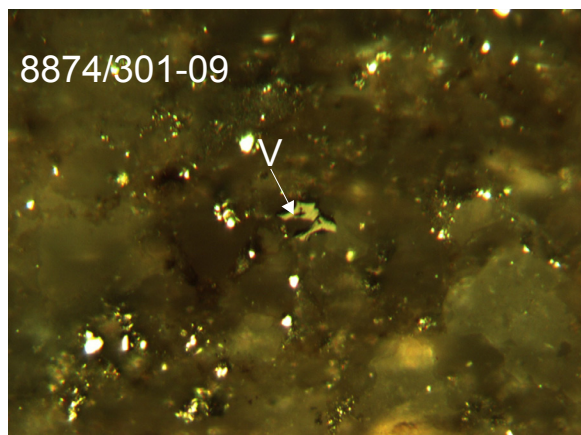


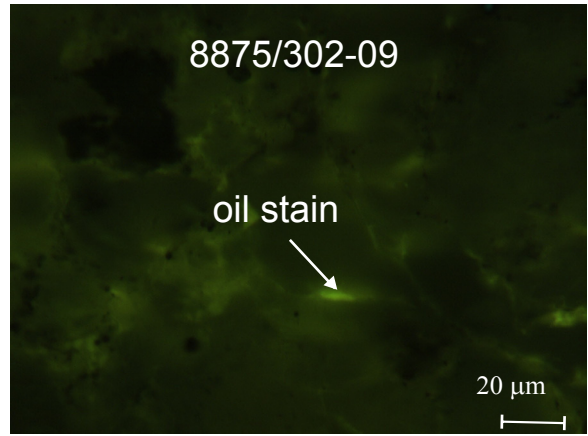
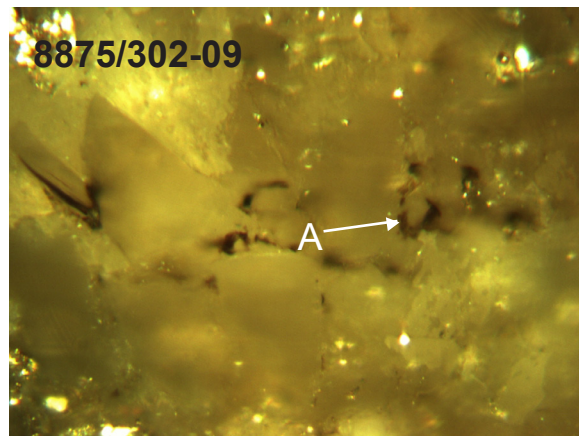
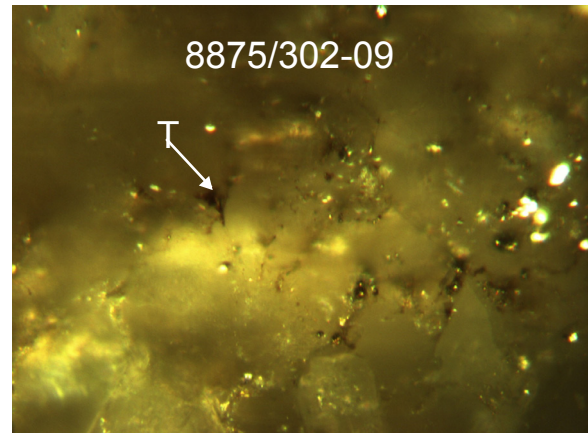
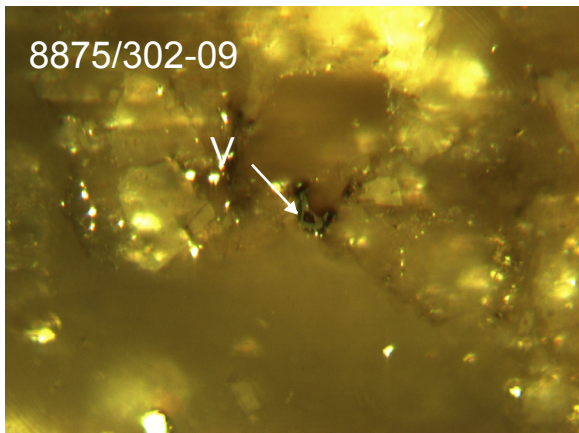
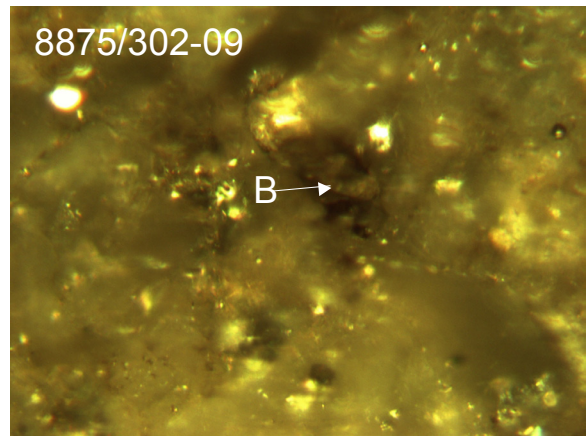
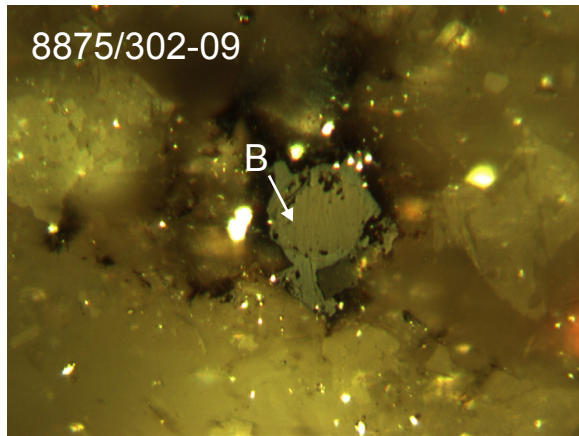




AGS 8874 /GSC 301-09 (Montney; (100/15-06-076-03W6/0), 1458.9m core depth). Pyrite-rich (Py), organically-lean, greenish, silty shale with a rare amount of yellow fluorescing Prasinophyte (P) alginite, mainly between intergranular pores, and acanthomorphic spiny acritarch (ac), and Tasmanites sp. (T). Rare amount of measurable vitrinite (V) and bitumen (B) lenses. There are also traces of oil stain (oil stain) found between intergranular pores. A = Alginite. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

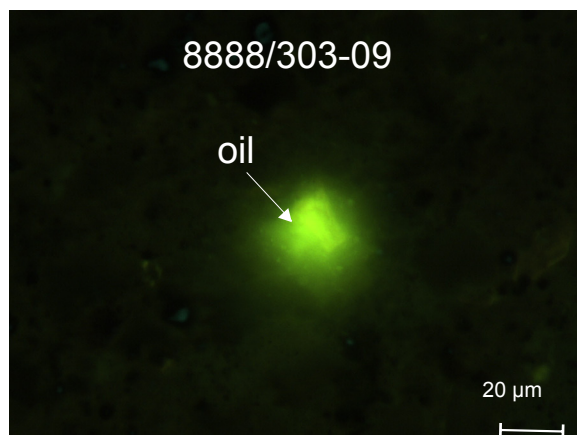
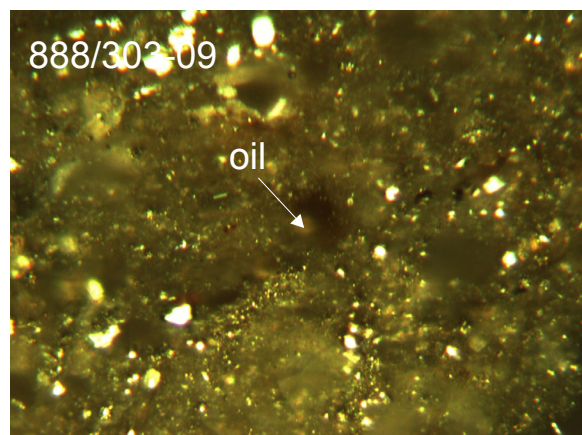
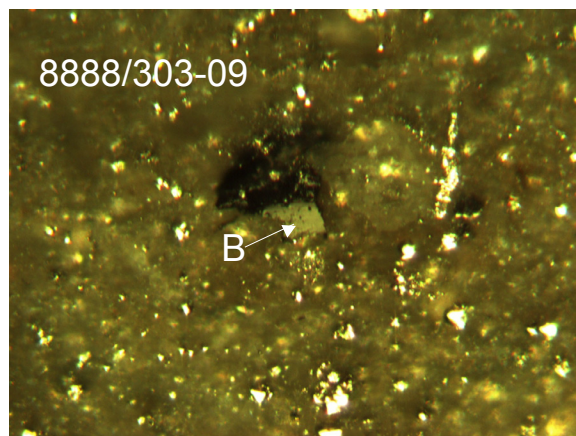
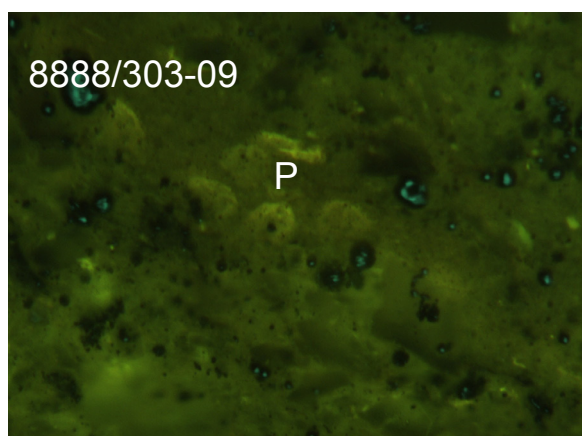
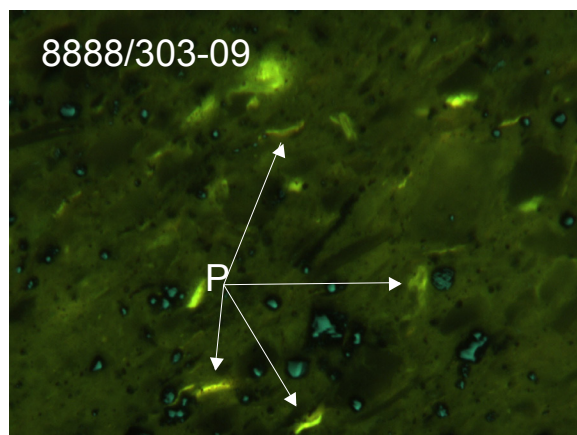
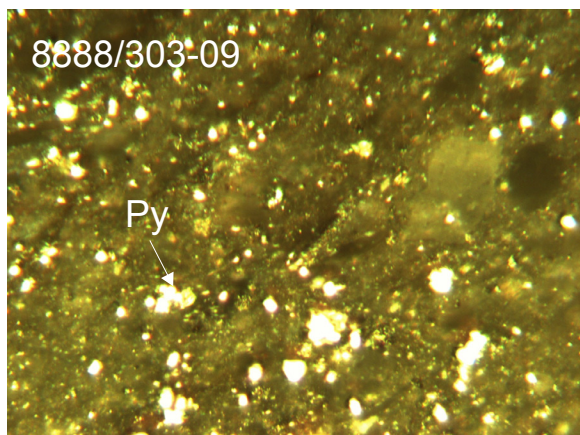






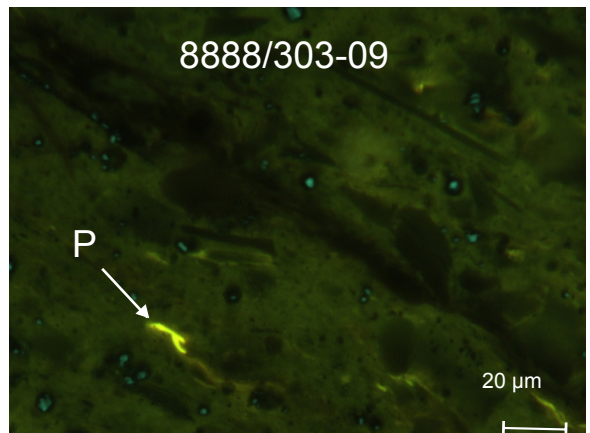
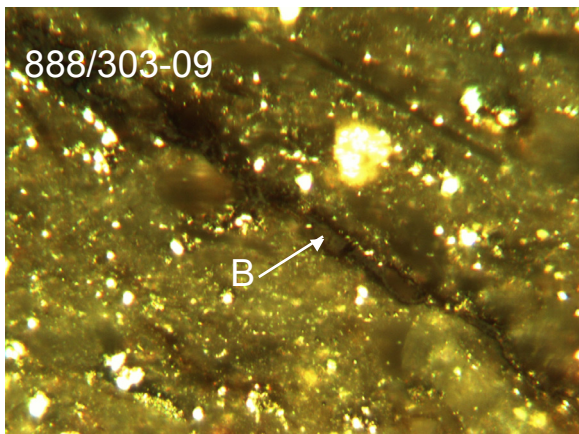
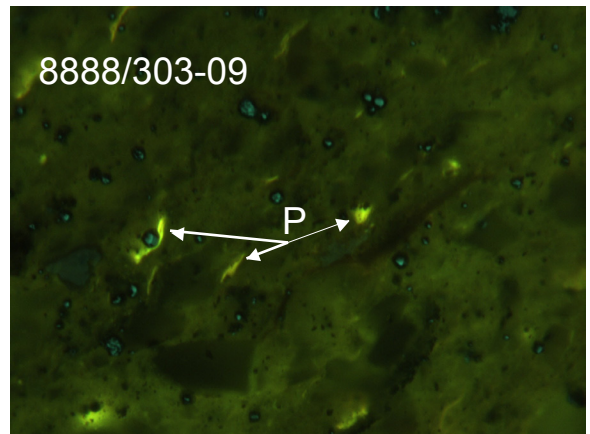
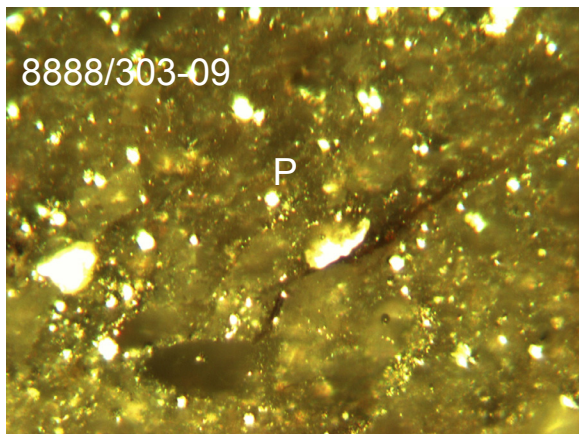
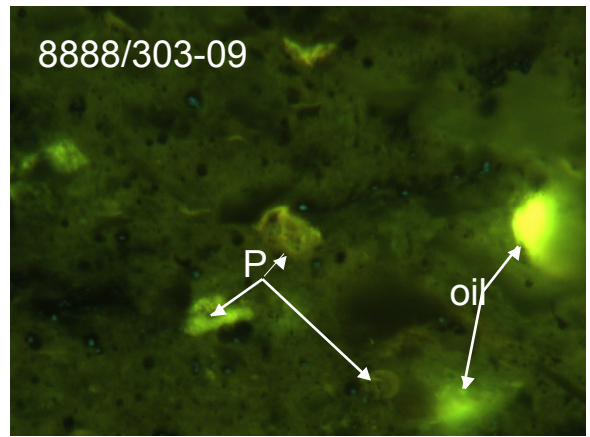
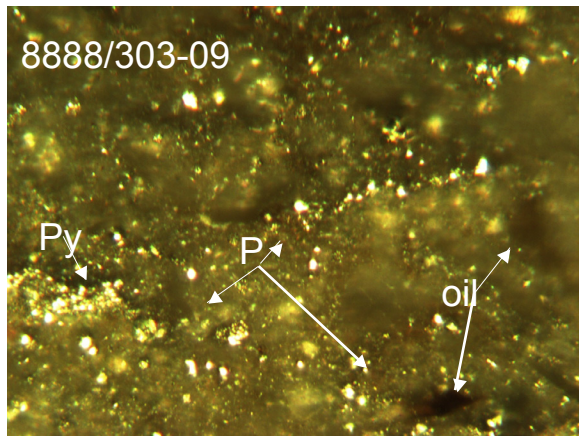
AGS 8875/GSC 302-09 (Montney, 100/16-31-066-23W5/0; 1708.6m core depth). Organically lean, greenish, silty shale with a trace amount of yellow fluorescing *Prasinophyte* and other alginite (A) lenses observed between intergranular pores. Rare measureable vitrinite (V) and bitumen (B) lenses with a trace of oil stain. T = *Tasminites*. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).



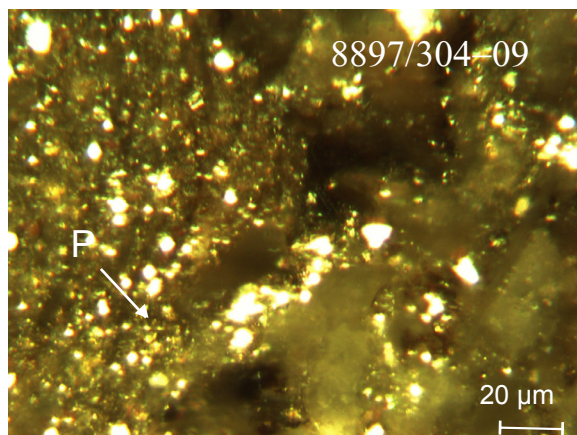
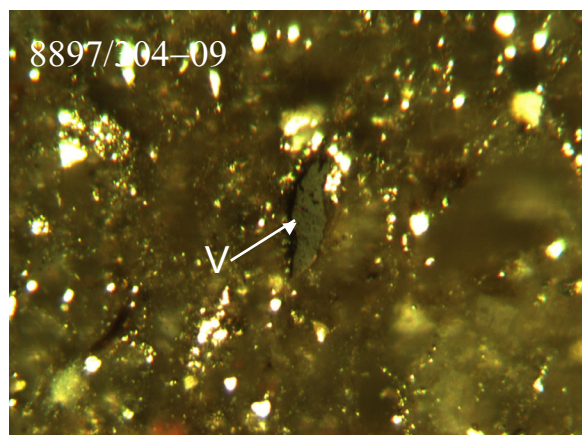
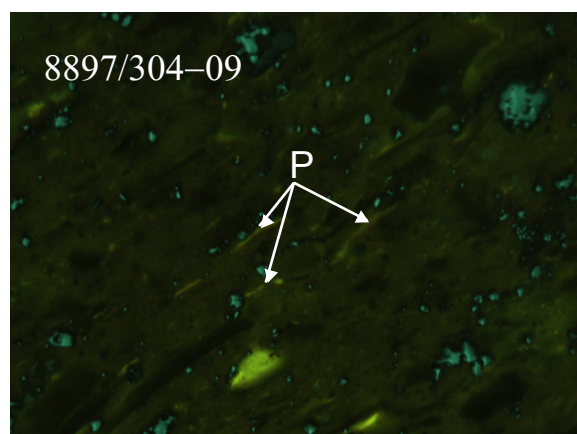
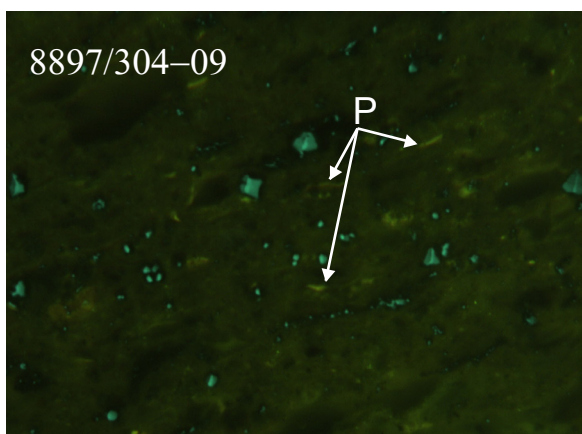
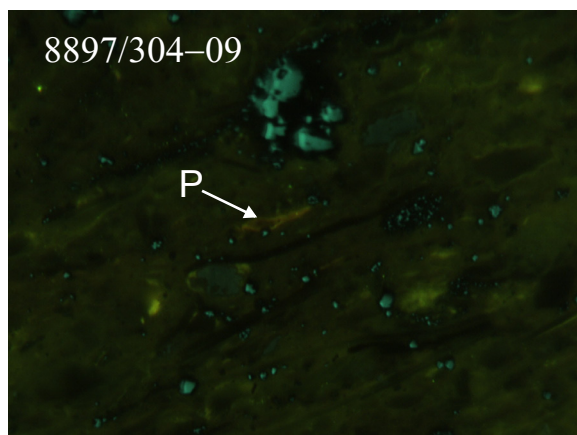
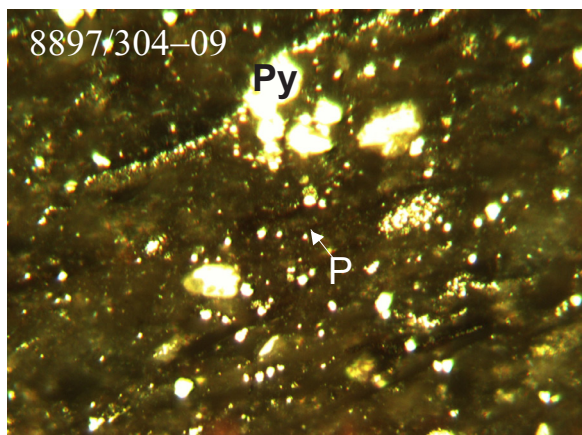


AGS 8888/GSC 303-09 (Montney, 100/12-07-067-24W5/00, 1917.6 m core depth). Alginite and pyrite-rich (Py), greenish, silty shale with a major to minor amount of yellow fluorescing Prasinophyte (P) alginite lenses observed between intergranular pores and a rare amount of yellow fluorescing soluble oil (oil) within a silty shale matrix. Rare measurable vitrinite (V) and bitumen (B) lenses with a trace of oil stain. %Ro may be suppressed. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

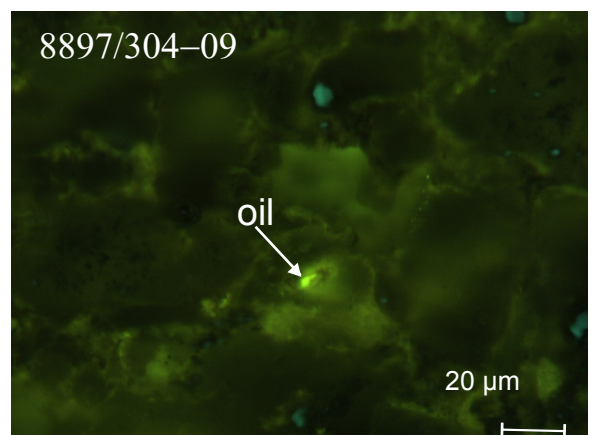
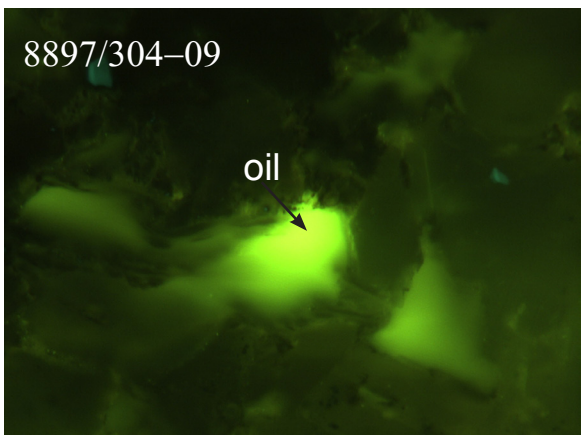
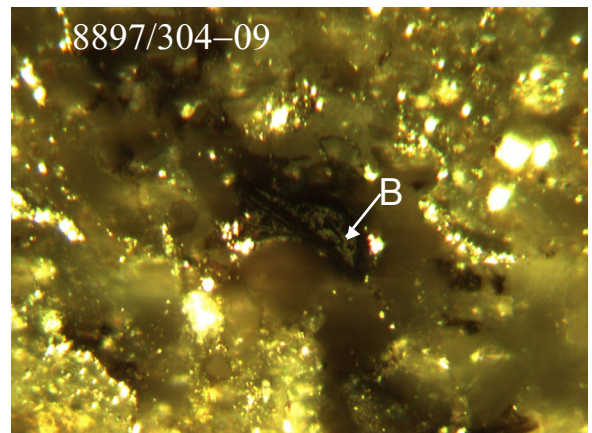
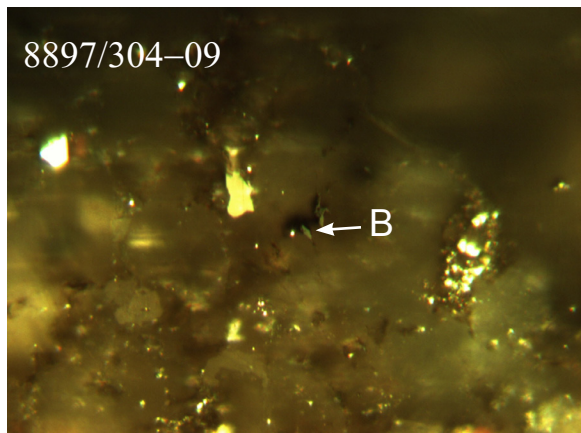
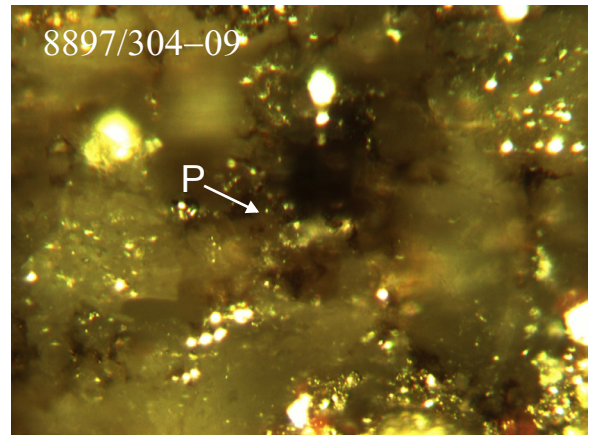
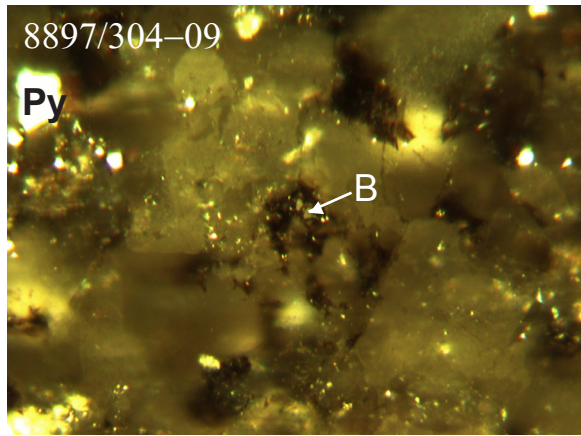




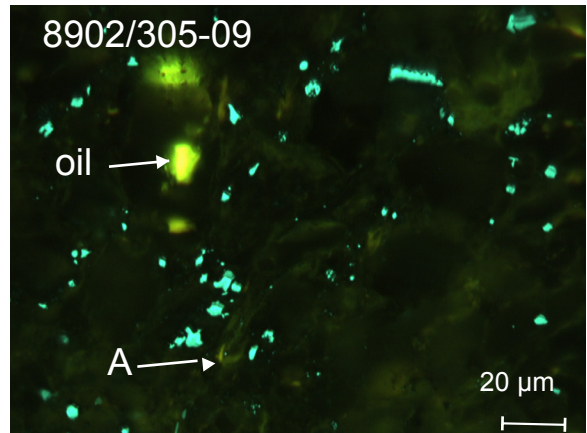
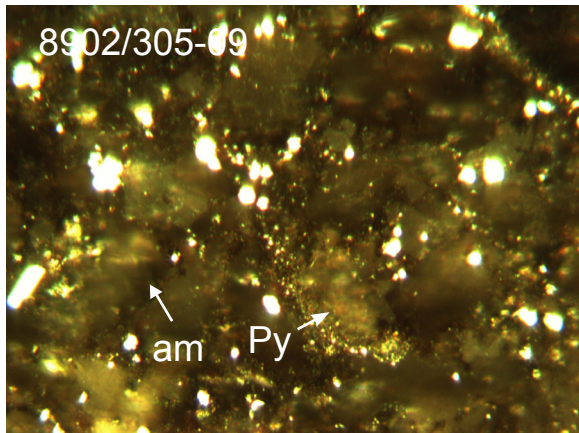
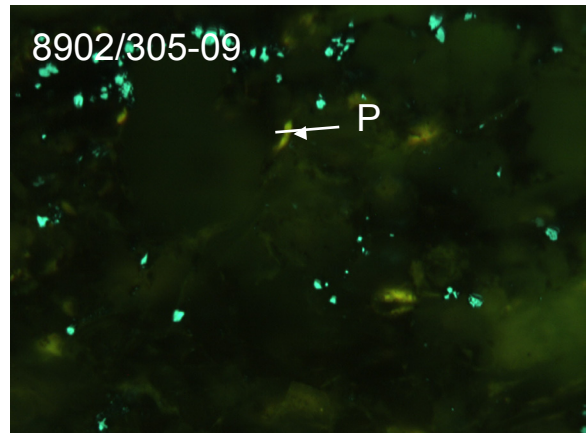
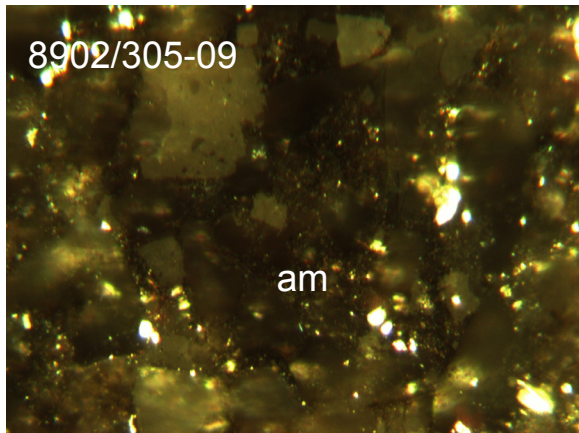
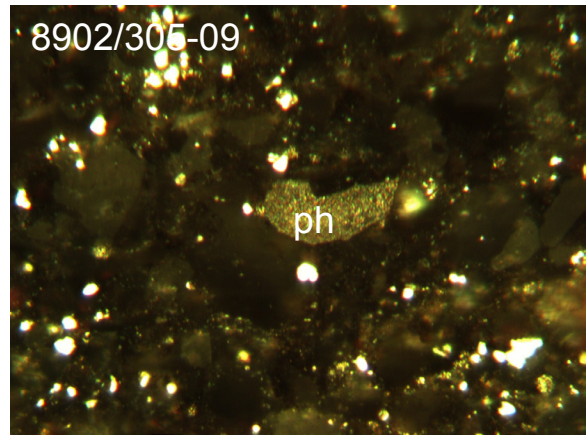
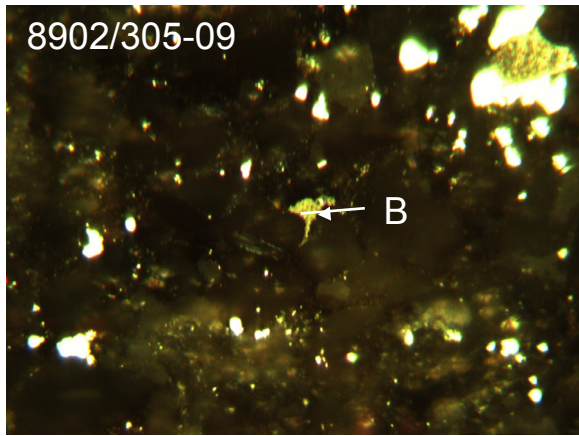




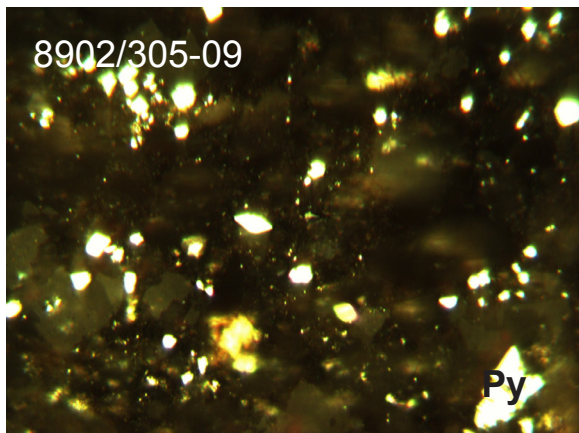
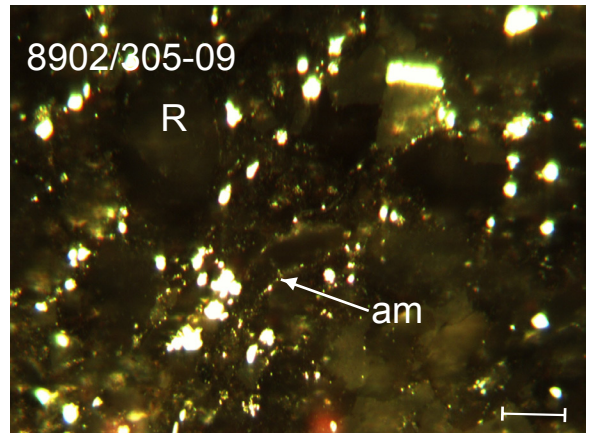
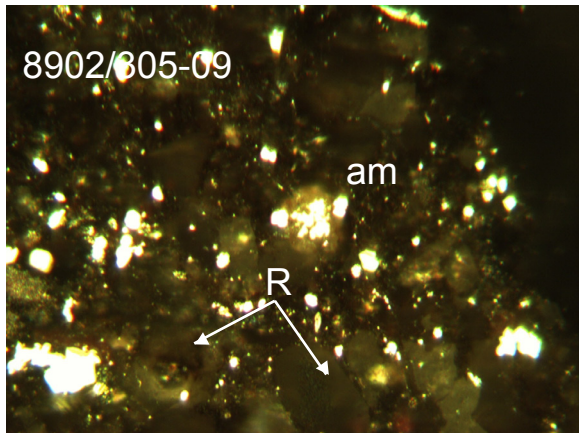
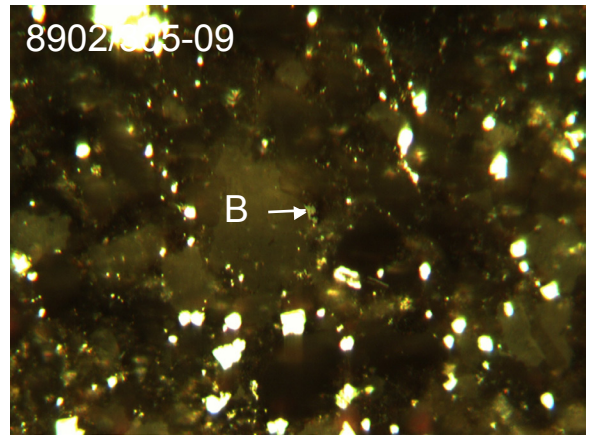
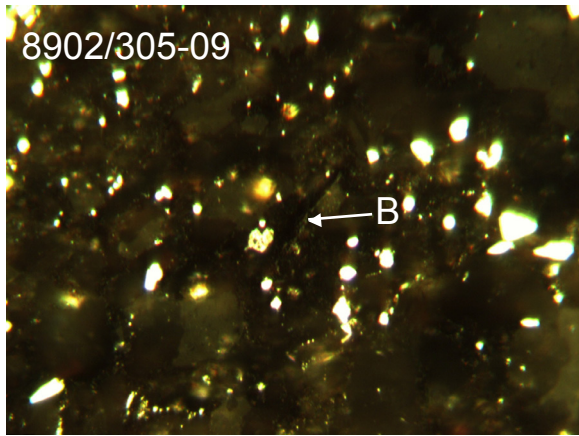
AGS 8897/GSC 304-09 (Montney; 2304.0 m core depth). Pyrite-rich (Py), silty shale with a minor amount of weak orange fluorescing Prasinophyte (P) alginite lenses observed between intergranular pores. A trace of non-fluorescing to fluorescing bitumen (B) and thin lenses of stylocumulates are observed between grains and fractures with a rare amount of yellow fluorescing soluble oil (oil) possibly migrating from the organic-rich, silty shale. Rare measureable of vitrinite (V) and bitumen (B) lenses. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).



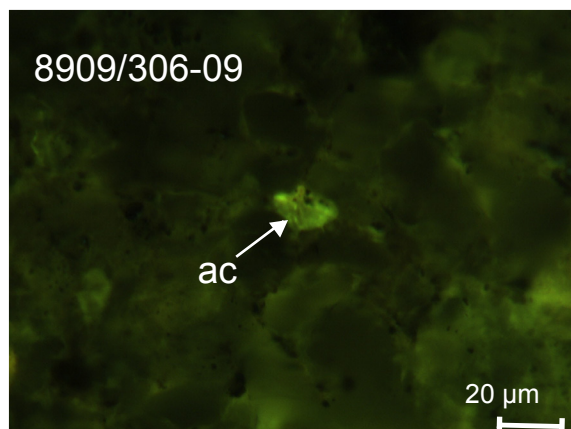
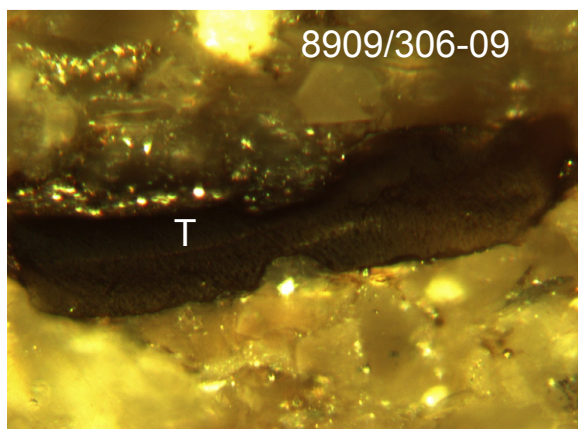
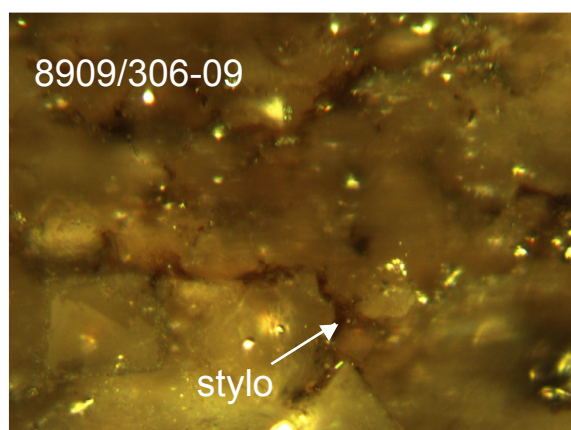
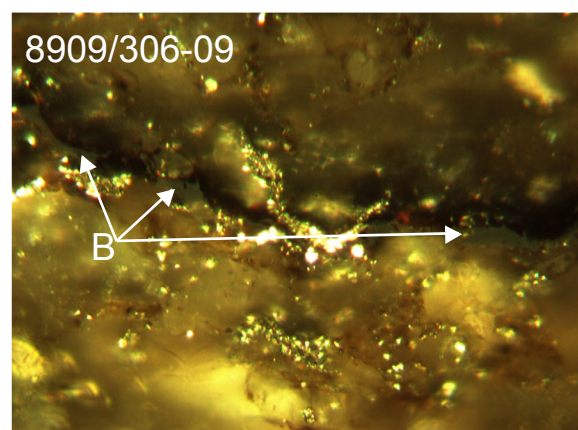
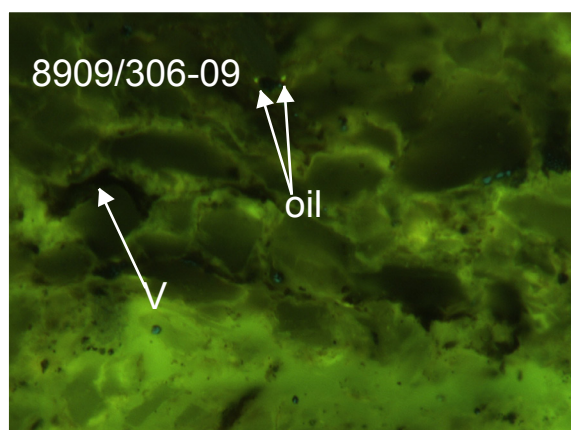
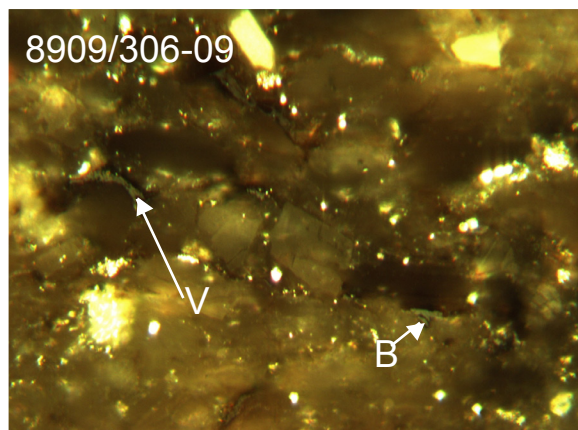




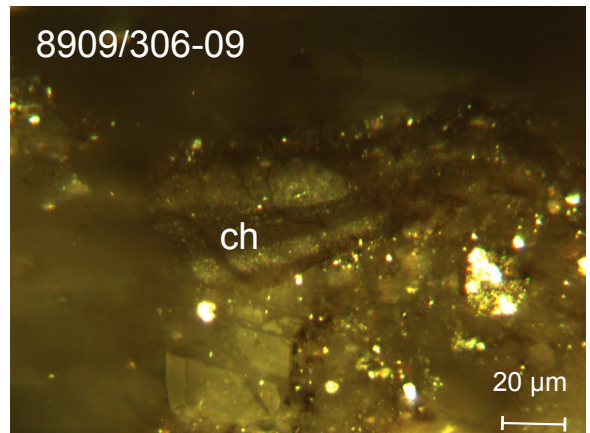
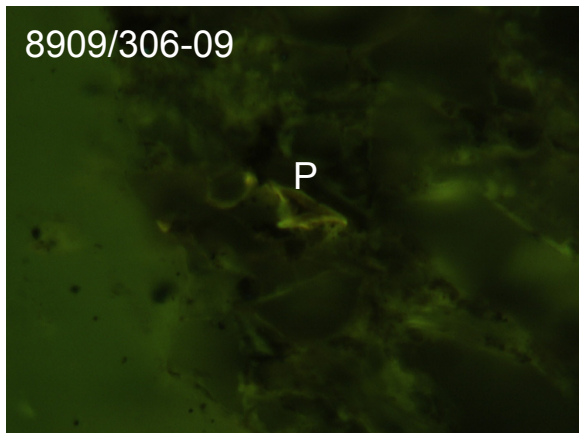
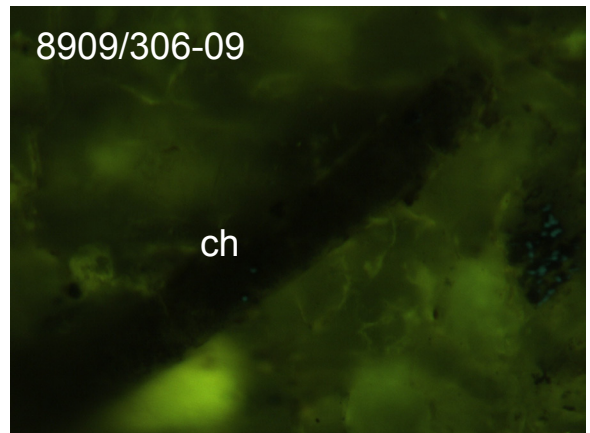
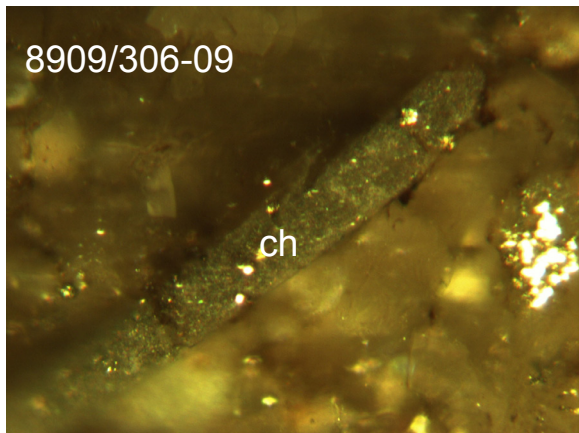
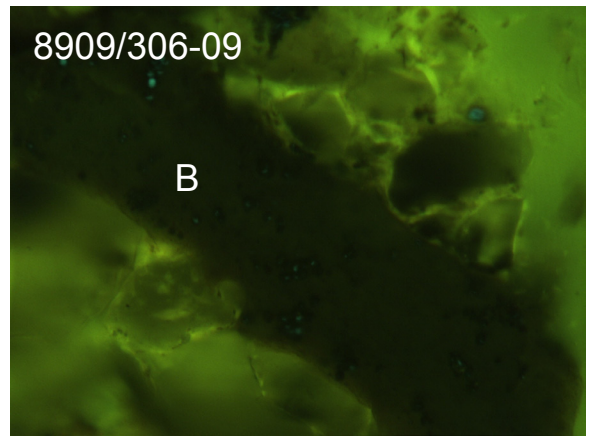
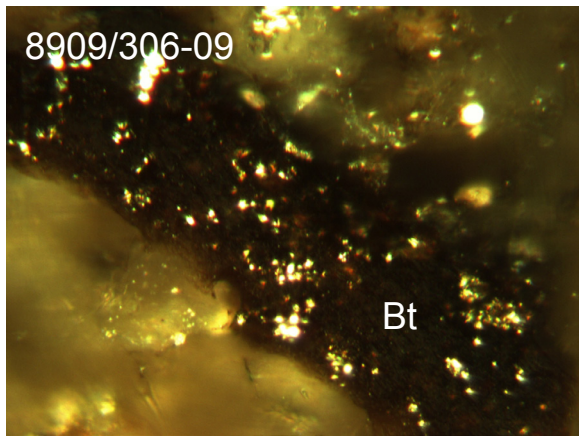
AGS 8902/GSC 305-09 (Montney; 100/06-14-066-06W6/00 3037.8m core depth). Organic-rich, black, silty shale comprised mostly of an interconnected network of spent kerogen with high micrinite and framboidal pyrite (Py) inclusions. Rare orange fluorescing alginite and Prasinophyte (P) and other alginite-derived fluorescing organic lenses brecciated between siltstone size carbonate grains. Rare oil stains were also observed inside some pores. Rare amount of measureable vitrinite or bitumen (B) lenses and thin orange fluorescing alginite lenses within a very fine-grained siltstone matrix. Trace amount of phosphatic nodules (ph) and calcite-filled, siliceous acanthomorphic marine acritarch, possibly radiolaria (R). A = Alginite. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). Oil = soluble oil; am = amorphous kerogen.



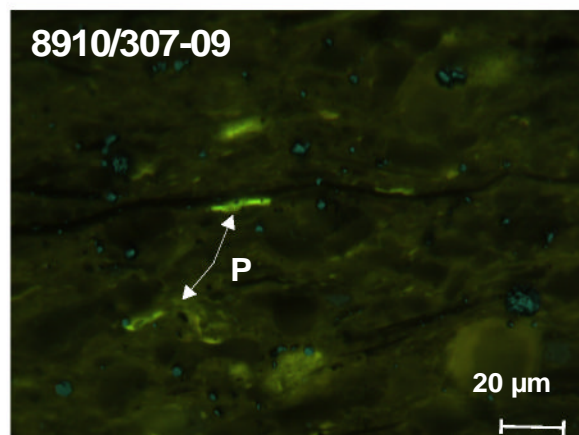
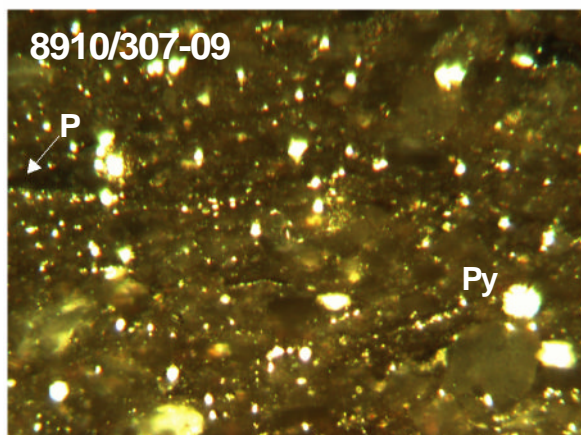
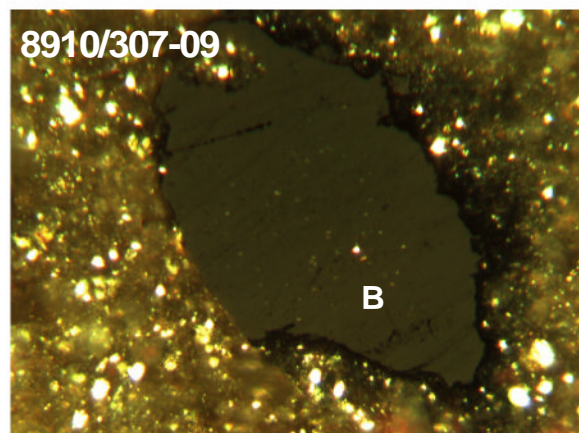
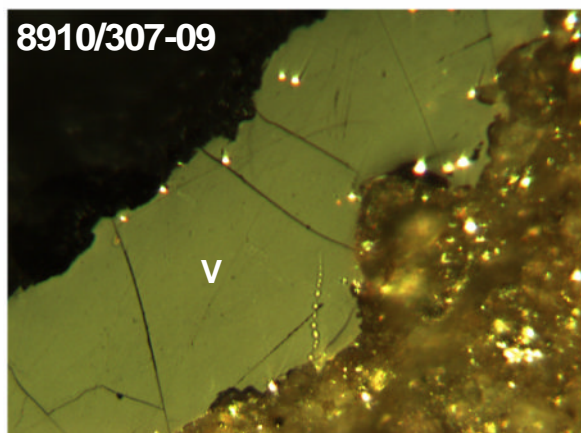
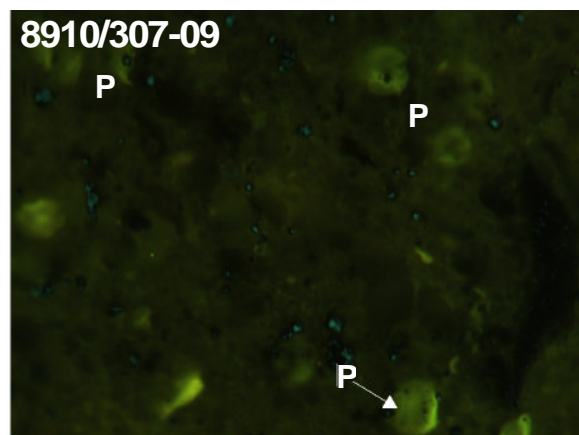
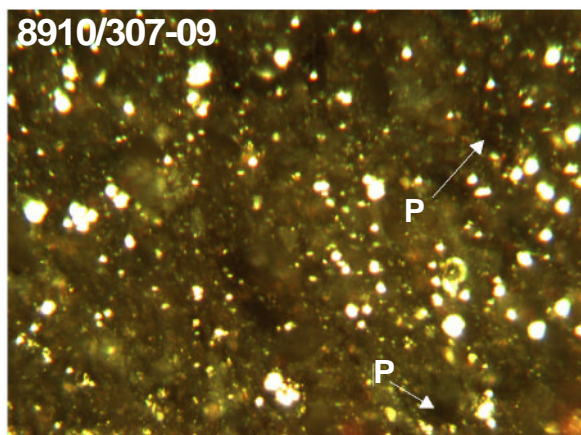




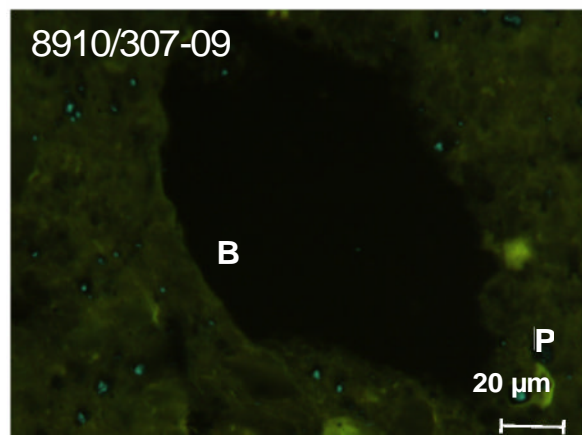
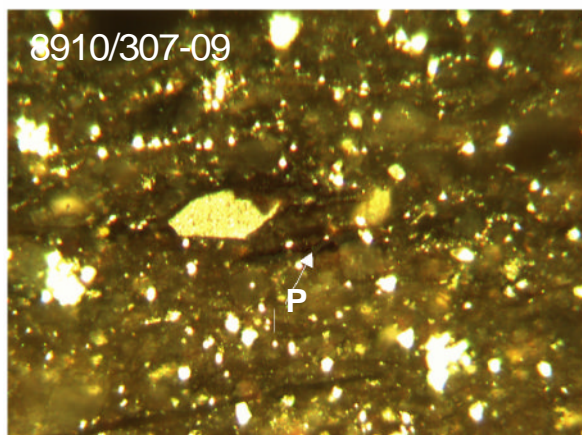
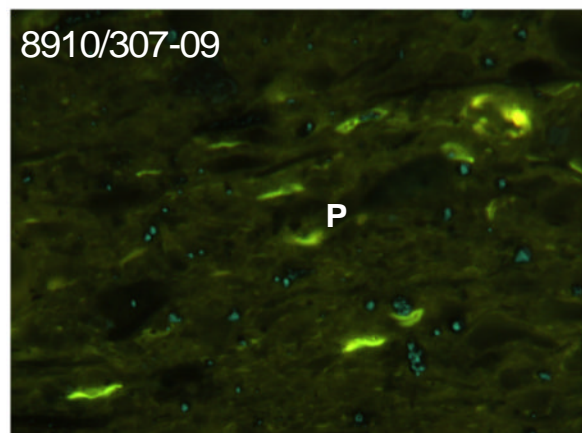
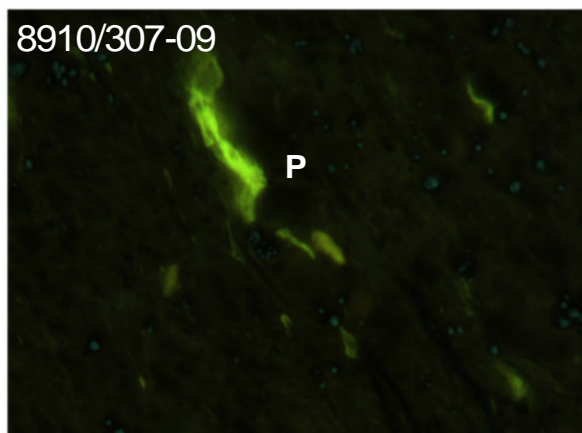
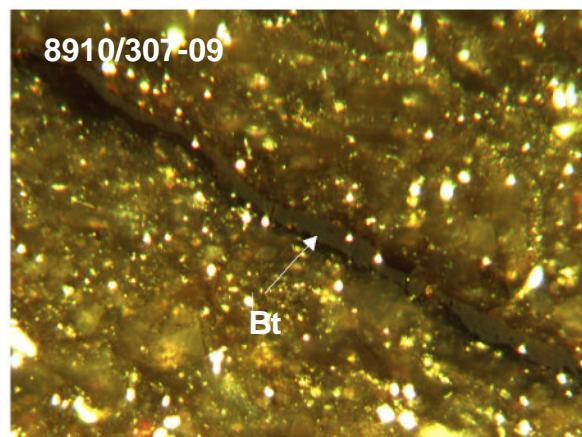
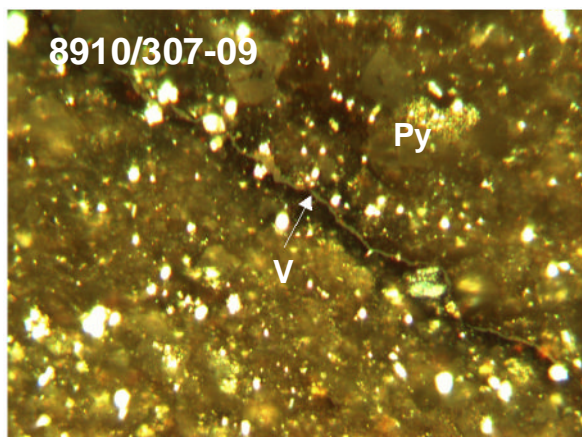
AGS 8909/GSC 306-09 (Montney; 102/01-14-091-12W6/00, 1118.2m core depth). Organically-lean, silty shale with a minor amount of alginite derived stylocumulates (stylo) and weak orange fluorescing bitumenite (Bt). Rare bright yellow fluorescing Prasinophyte alginite (P) and Tasmanites sp. (T), acanthomorphic spiny acritarch (ac), and chitinous (ch) lenses (possibly fishbone), Trace amount of non-fluorescing to fluorescing bitumen (B) and yellow fluorescing soluble oil (oil). Rare measureable of vitrinite (V) and bitumen (B) lenses. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).



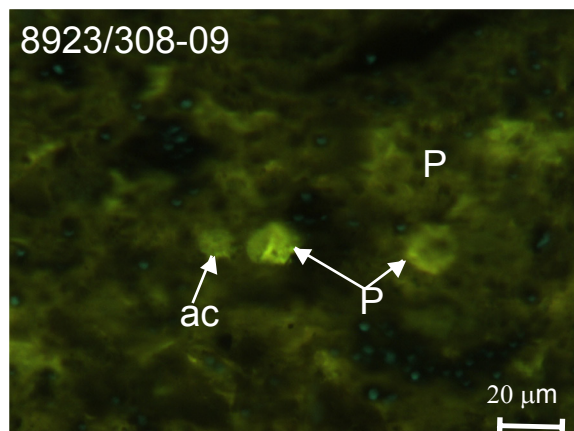
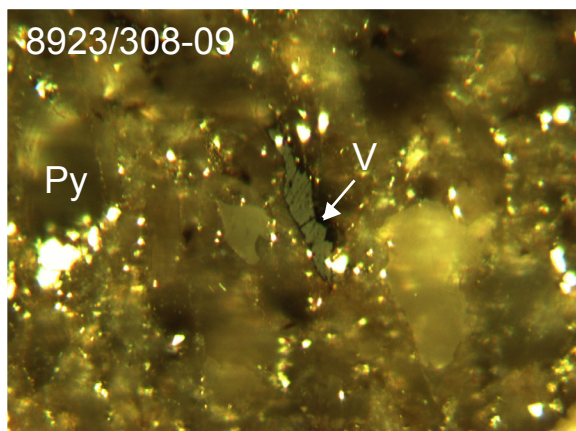
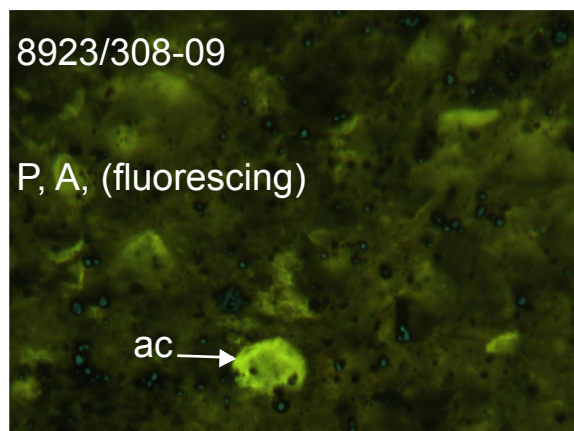
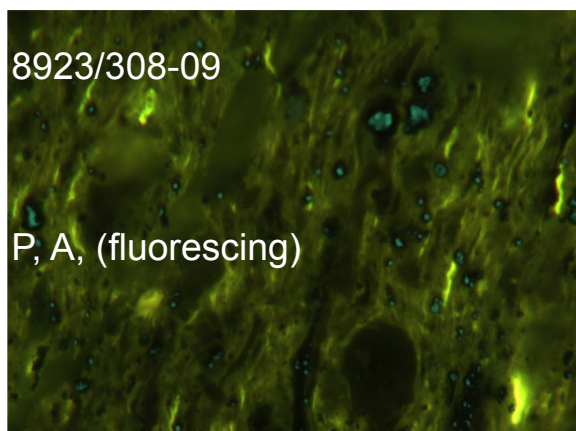
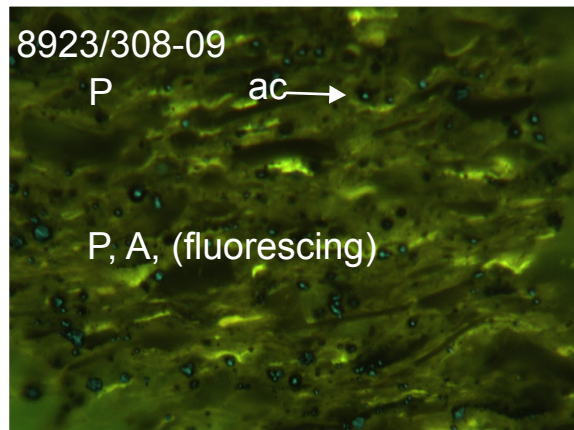
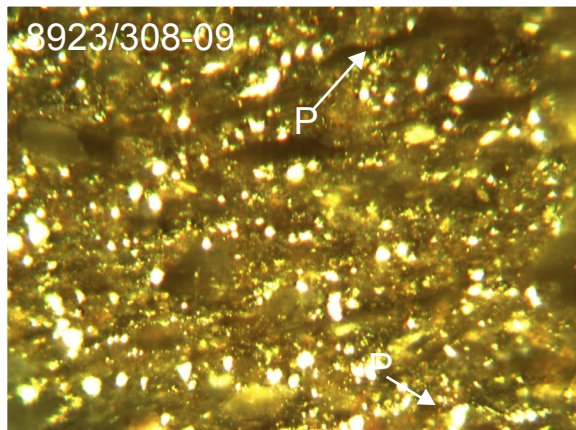




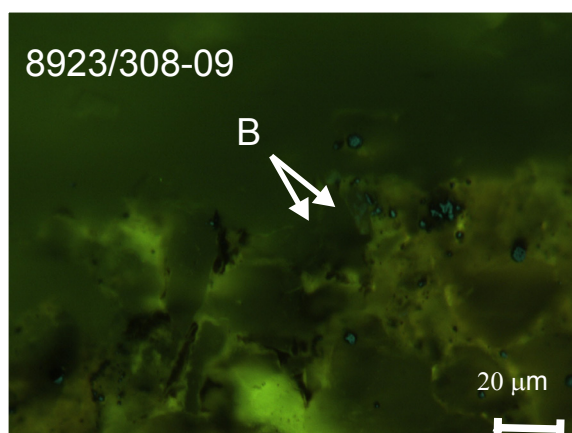
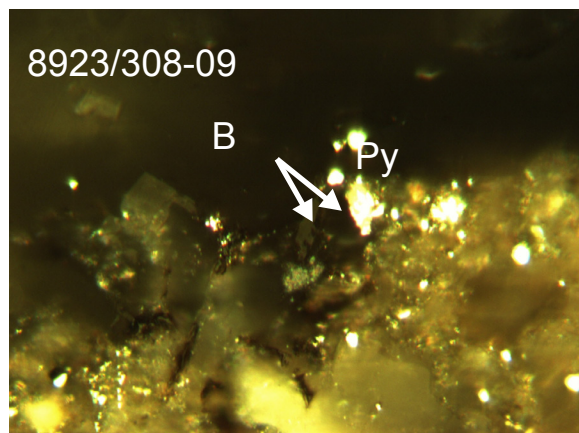
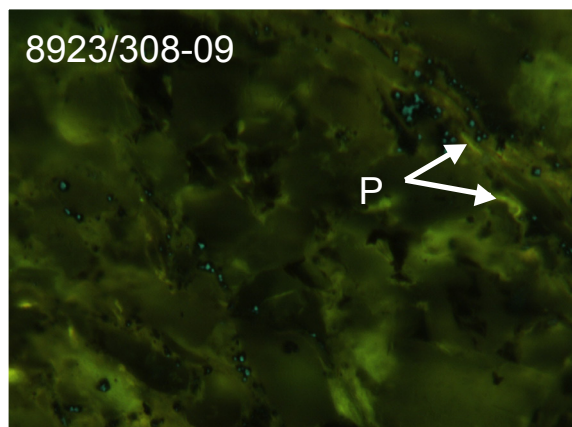
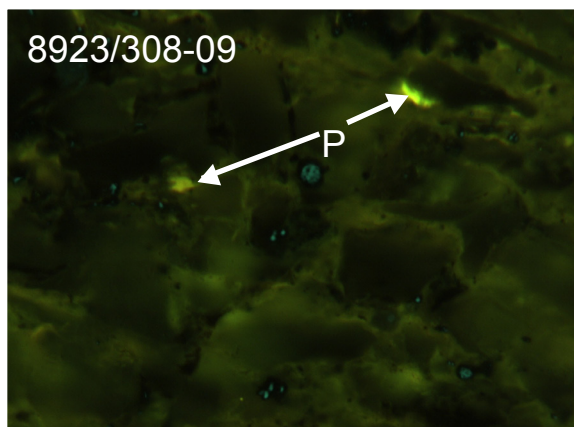
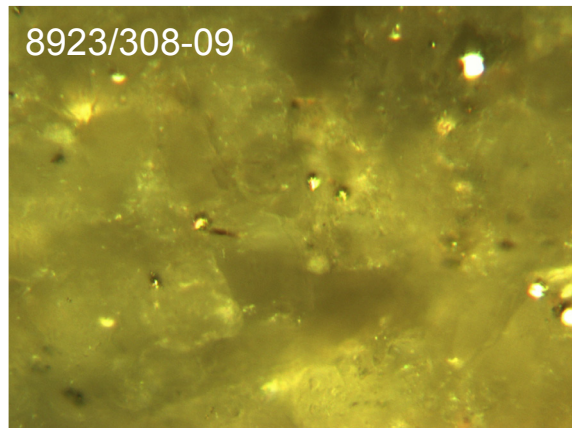
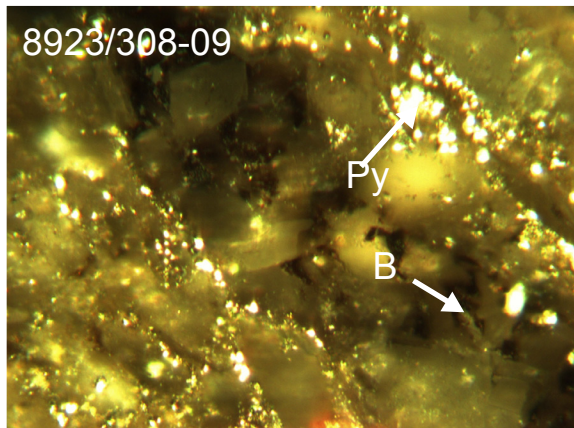
AGS 8910/GSC 307-09 (Montney; 100/04-32-084-12W6/00, 1581.3 m core depth). Pyrite-rich (Py), greenish, silty shale with a minor amount of greenish-yellow fluorescing alginite and weak brown fluorescing bitumenite (Bt). A minor amount of yellow fluorescing Prasinophyte alginite (P) is present with rare measurable vitrinite coal lenses (V) and bitumen (B). Trace of yellow fluorescing oil stain. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).



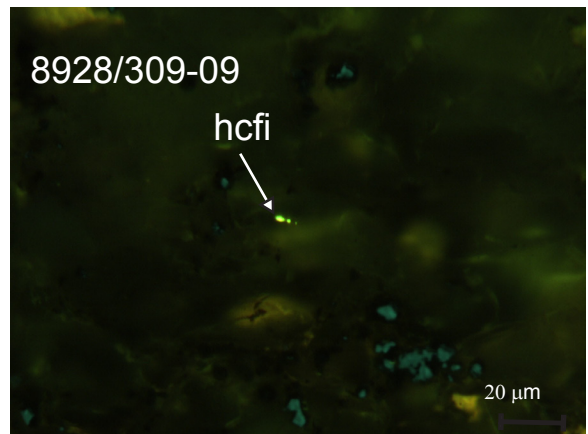
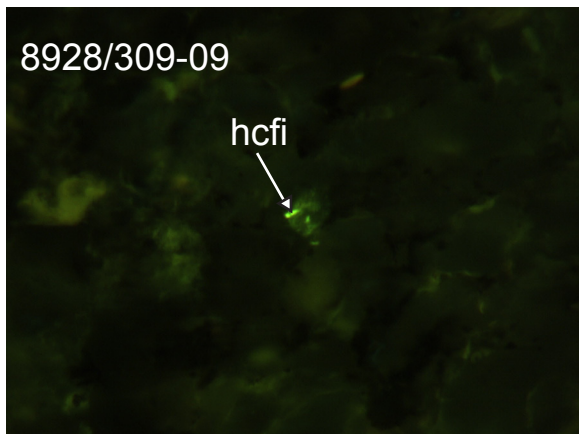
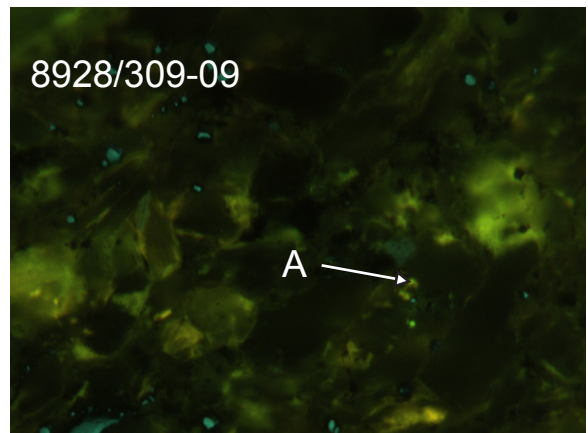
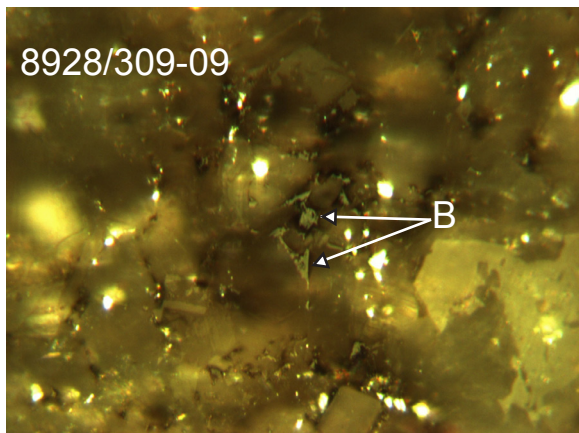
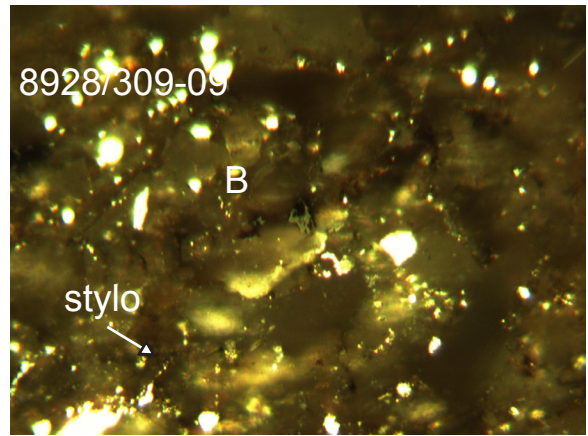
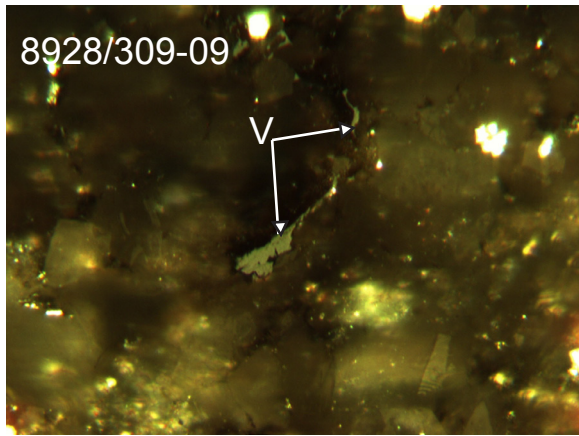




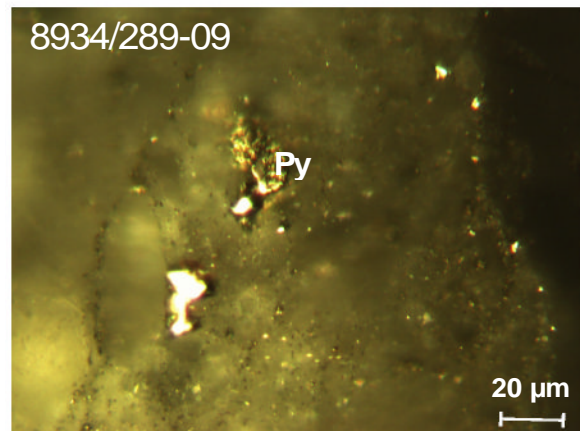
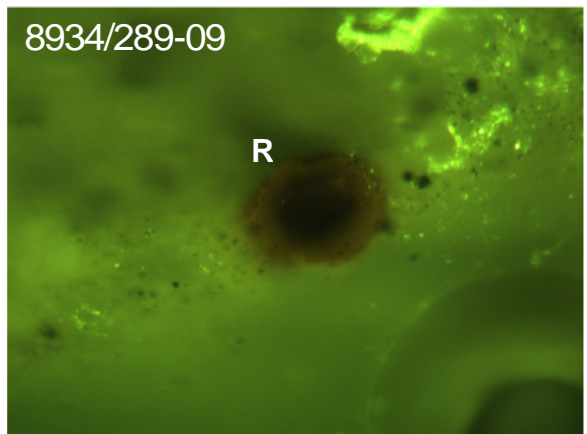
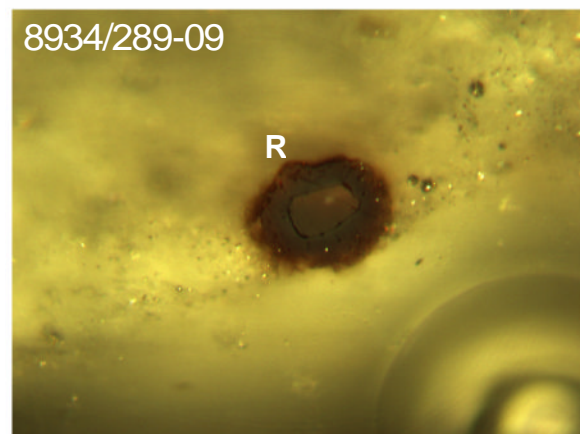
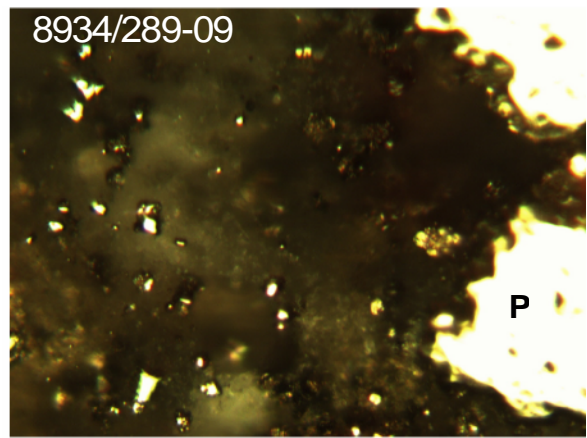
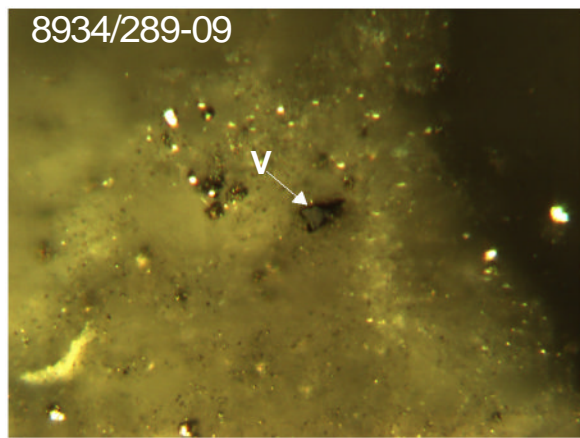
AGS 8923/GSC 308-09 (Montney; 100/14-30-082-07W6/00, 1245.7m core depth). Mixture of organically-lean siltstone, alginite and pyrite-rich (Py), greenish silty shale. Major amount of non-fluorescing to greenish-yellow fluorescing Prasinophyte (P) alginite (A), with rare spiny acanthomorphous acritarch (ac) observed primarily in the silty shale matrix, and rarely observed in the coarse grain siltstone matrix. Rare vitrinite coal lenses (V) and bitumen (B, somefluorescing). %Ro may be suppressed. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected whitelight, 50X magnification).





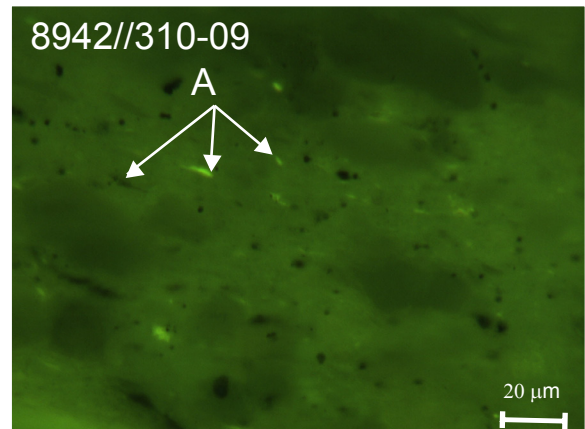
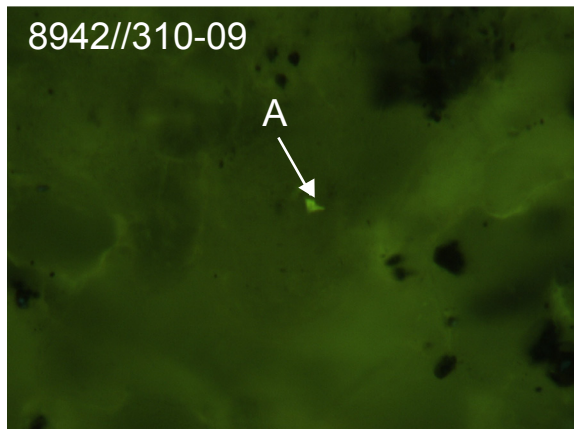
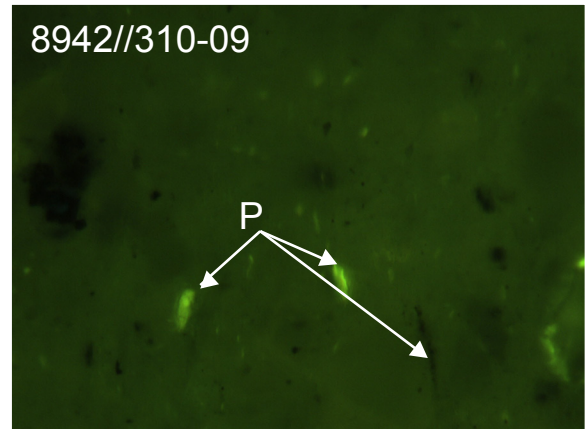
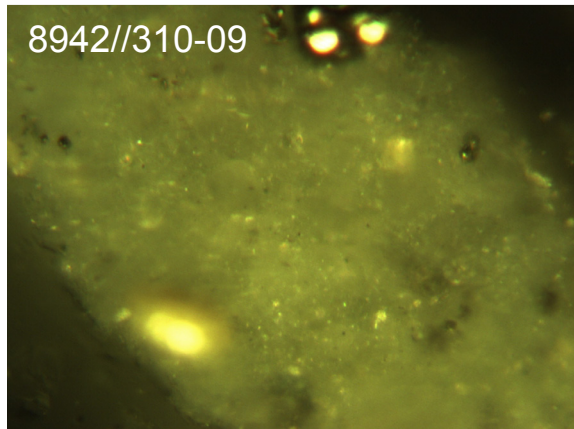
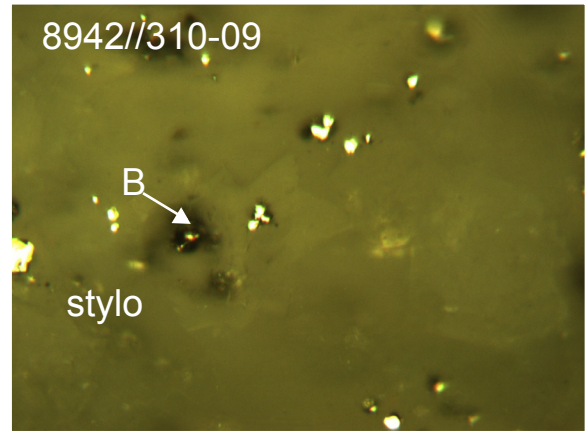
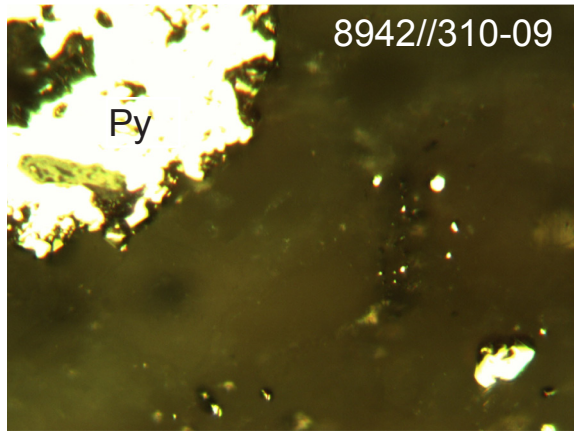


AGS 8928/GSC 309-09 (Montney; 100/15-08-081-12W6/00, 1833.1m core depth). Siltstone with a minor amount of stylocumulate (stylo) lenses observed between intergranular pores of carbonate grains and within fractures of a siltstone dominated matrix. Rare vitrinite coal lenses (V) and bitumen (B) from alginite-derived stylocumulates. Trace amount of bright, yellow fluorescing hydrocarbon fluid inclusion (hcfi) annealed within quartz and calcite minerals. A = Alginite. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

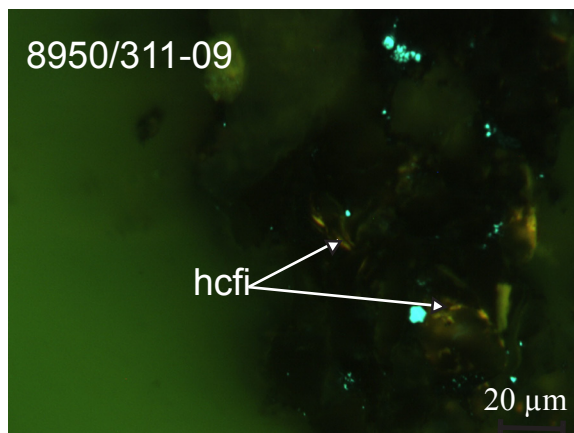
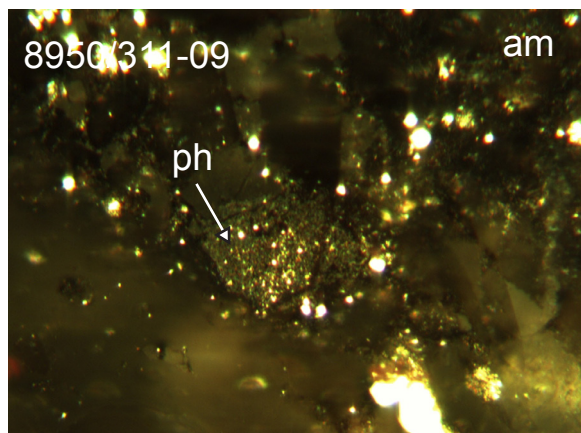
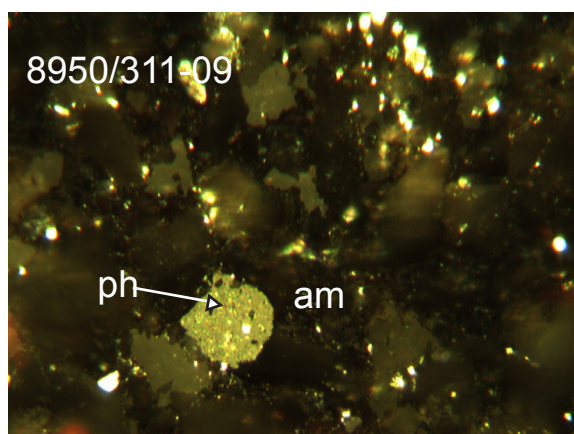
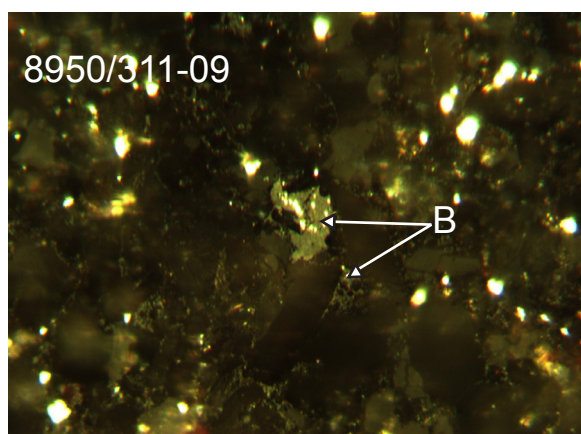
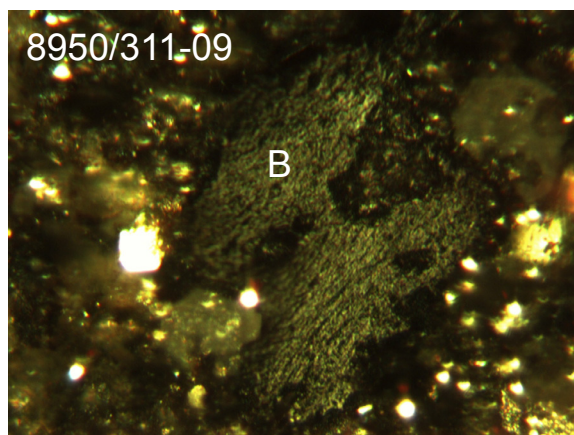
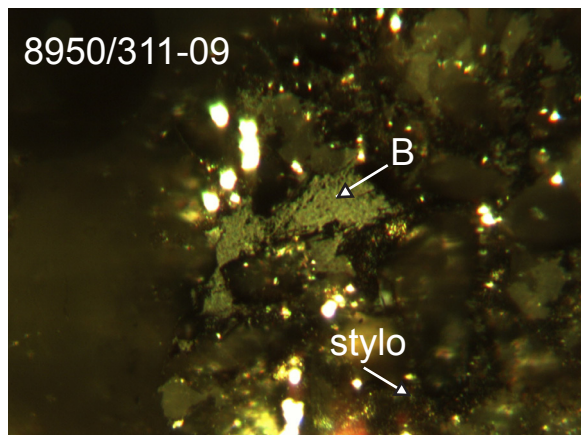


AGS 8934/GSC 289-09 (Montney; 100/11-32-082-25W5/00, 929 m core depth). Organically lean, framboidal pyrite-rich (Py) siltstone carbonates with a trace amount of very fine grained organic matter. Very rare, small vitrinite (V), fluorescing Prasinophyte alginite (P), and carbonate-filled radiolaria (R) lenses. No evidence of fluorescing organic matter. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).



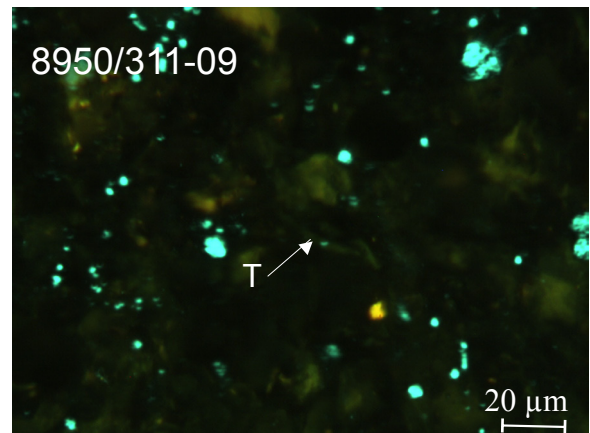
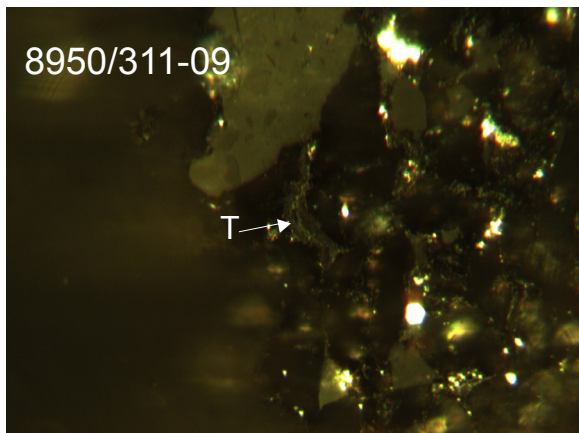
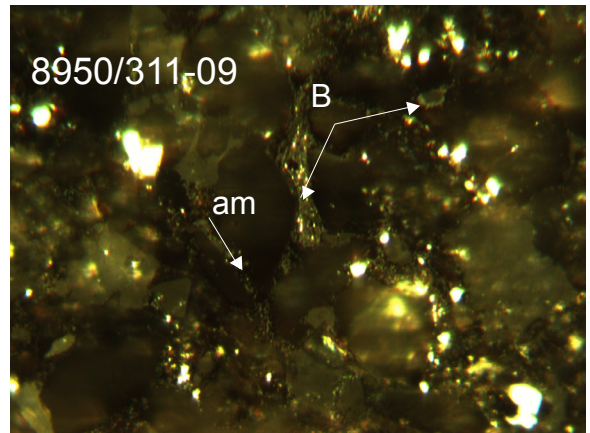
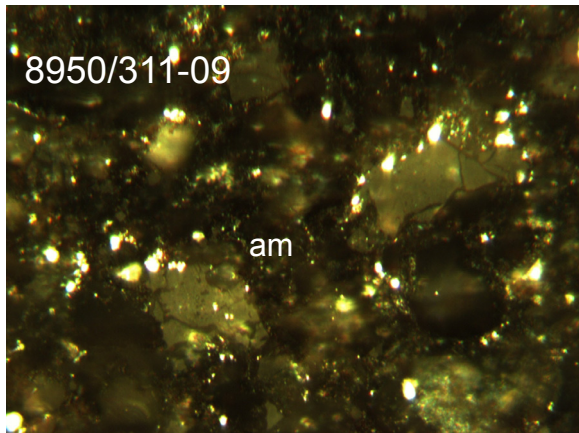
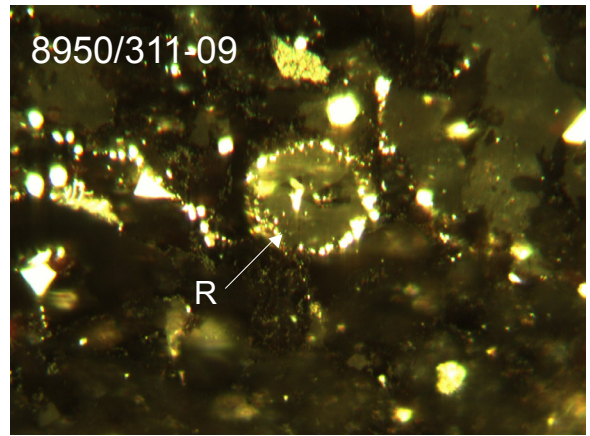
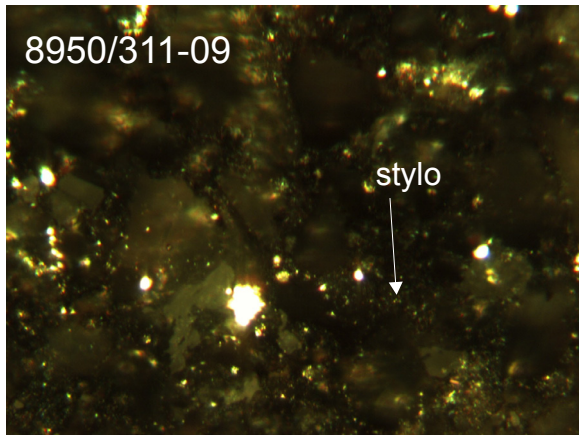


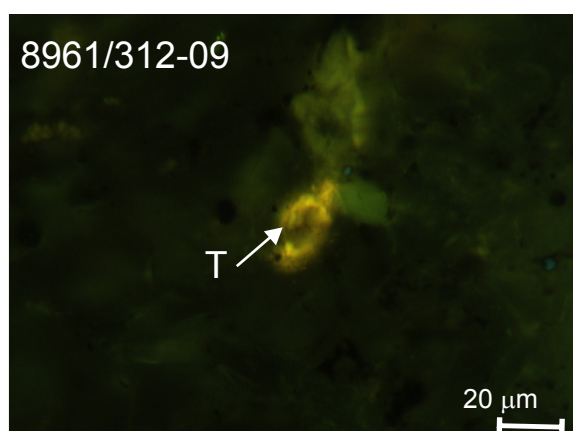
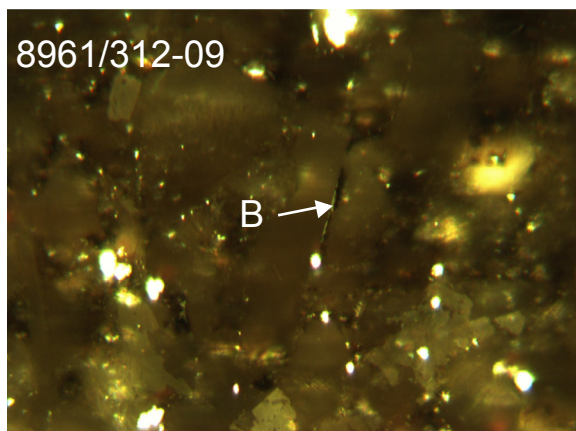
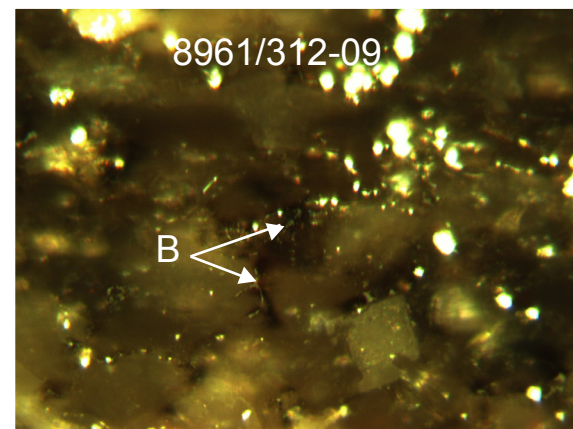
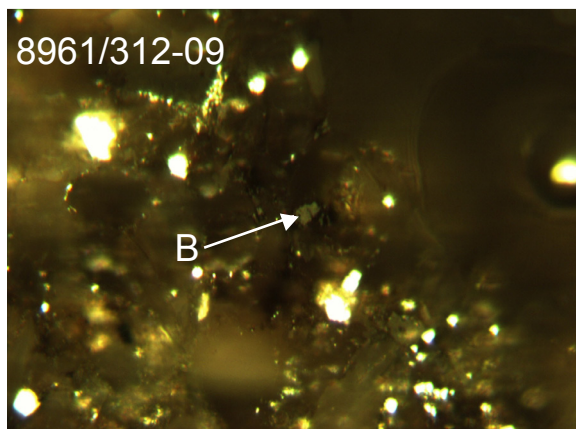
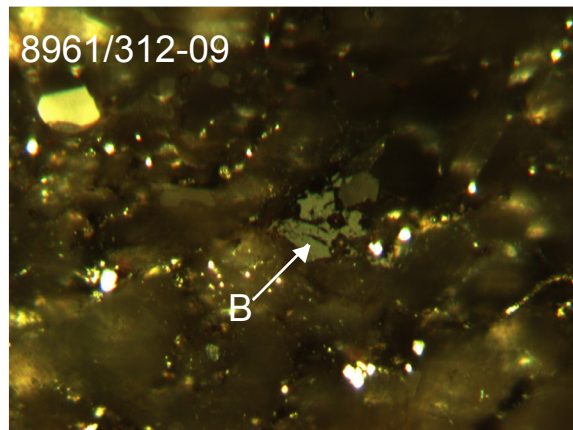
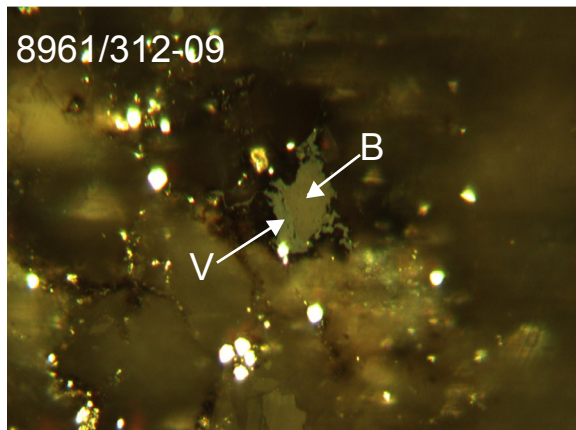
AGS 8942/GSC 310-09 (Montney; 100/02-30-071-20W5/00, 1324.3m core depth). Organically lean siltstone with rare pyrite (Py) and small non-fluorescing and yellow fluorescing alginite (A) (possibly Prasinophyte, P) lenses. B = Bitumen. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).



AGS 8950/GSC 311-09 (Montney; 100/14-27-067-08W6/00, 3032.0m core depth). Organic-rich, black, silty shale comprised mostly of an interconnected network of amorphous kerogen (am). A minor amount of mostly granular bitumen (B) with pyrite and micrinite inclusions within a fine-grained carbonate matrix. Also observed are rare pyrite-rich phosphatic nodules (ph), weak fluorescing *Tasmanites* sp. (T), calcite-filled radiolaria (R) and rare hydrocarbon fluid inclusion (hcfi). stylo = stylocumulate. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

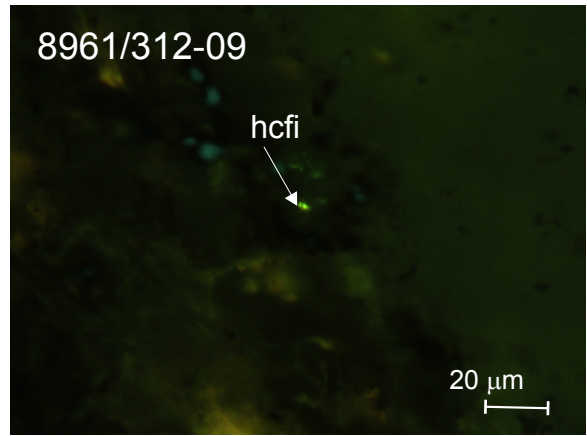
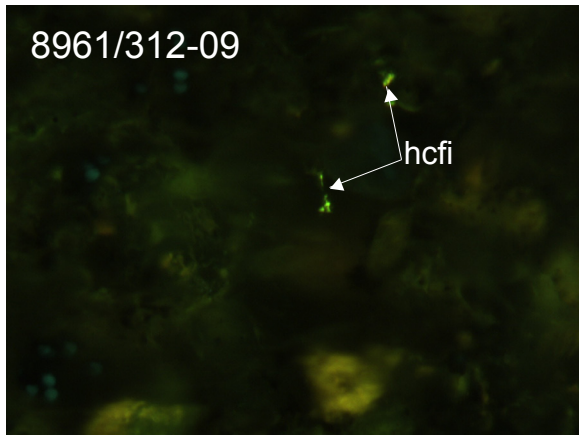


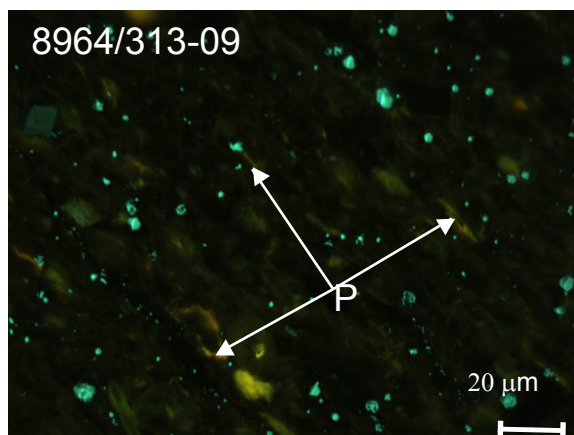
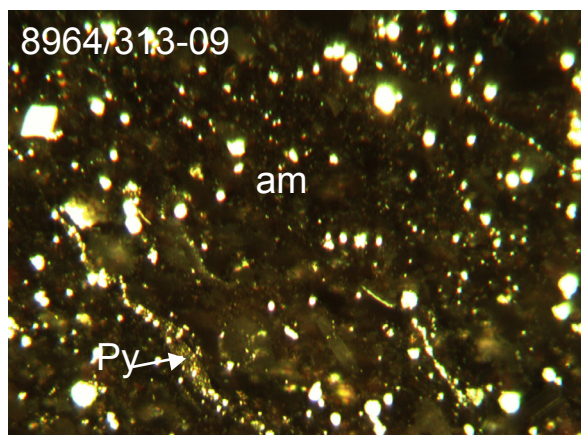
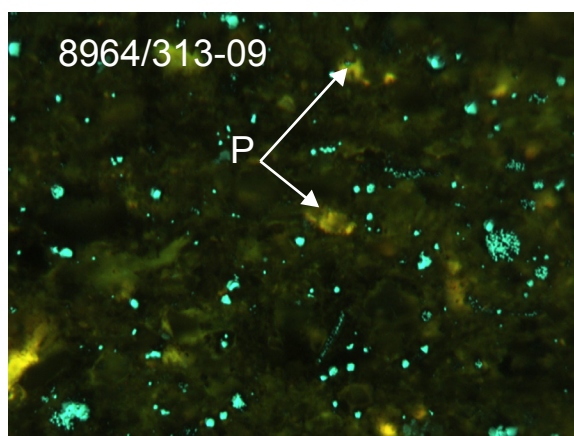
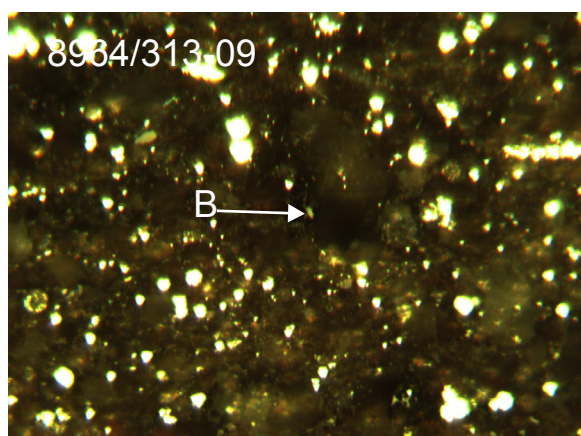
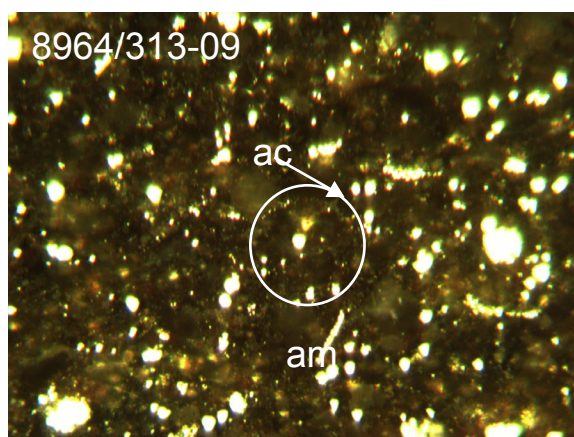
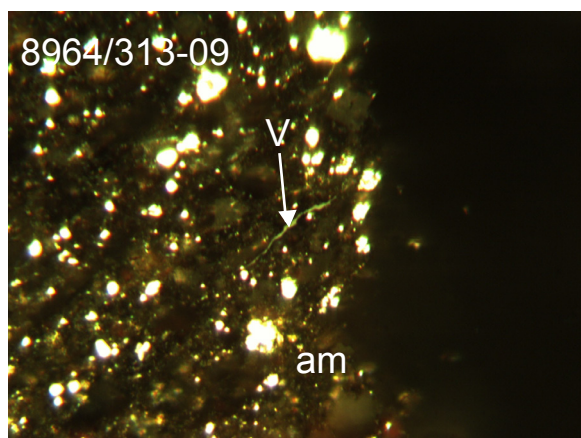




AGS 8961/GSC 312-09 (Montney; 100/06-12-079-12W6/00, 2028.5m core depth). Organic-rich, black, silty shale comprised mostly of stylolites, amorphous kerogen between the intergranular pores of a carbonate matrix. Also observed are rare, yellow fluorescing hydrocarbon fluid inclusions (hcfi) annealed within quartz and calcite minerals. Rare vitrinite coaly lenses (V) and bitumen (B) lenses. %Ro may be slightly suppressed. T = *Tasminites*. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).

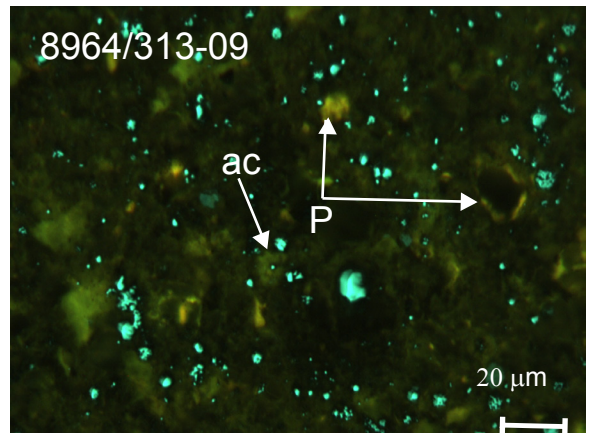
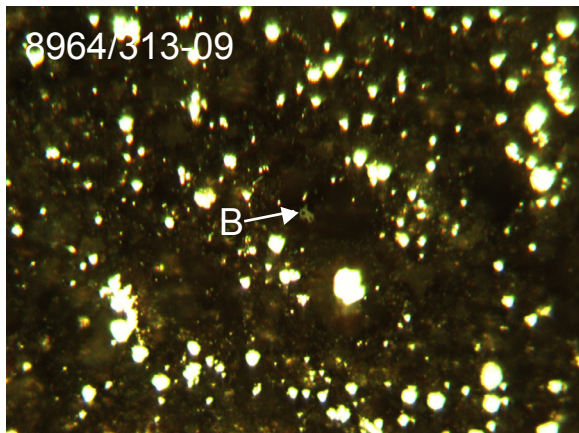
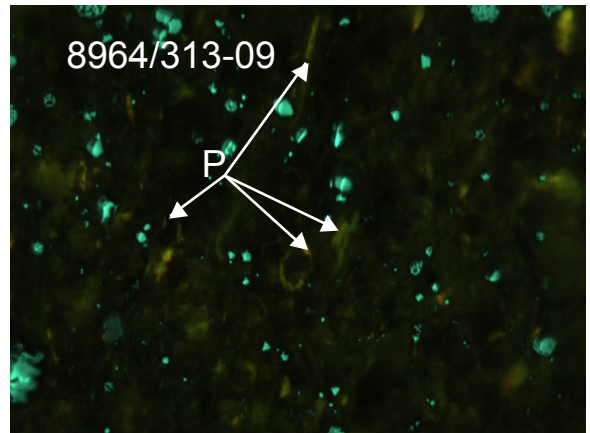
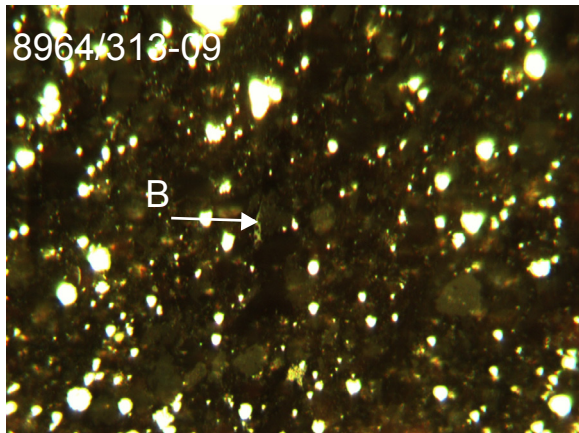
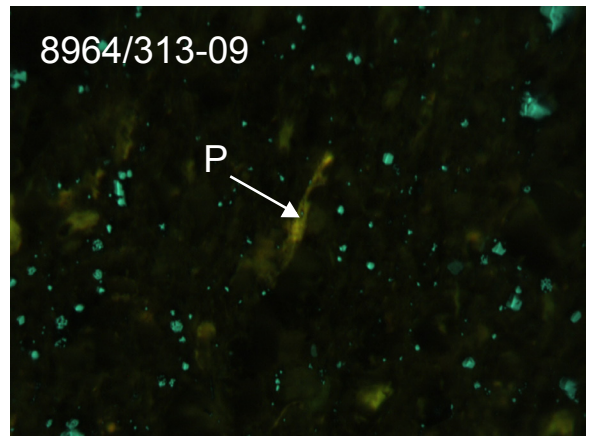
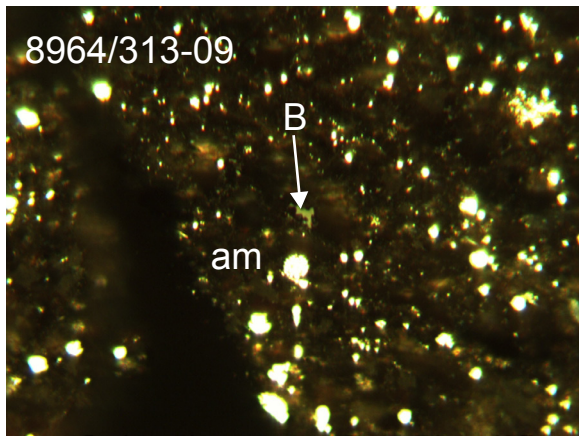


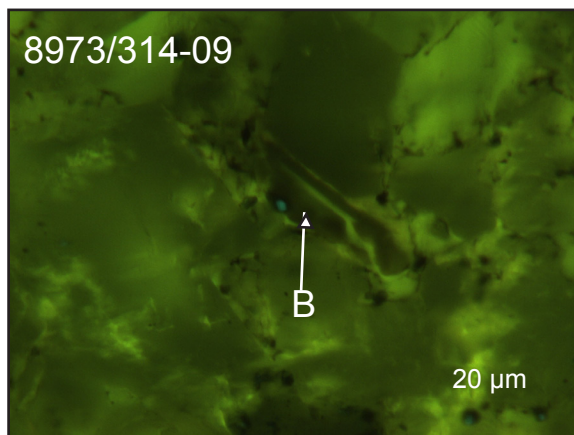
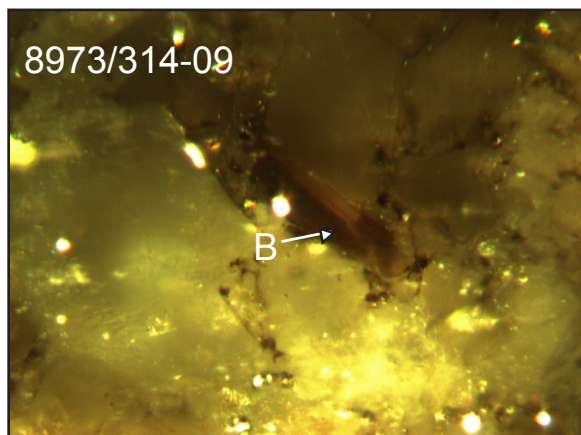
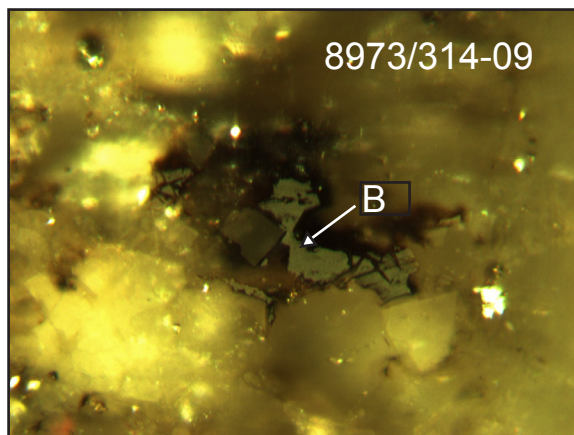
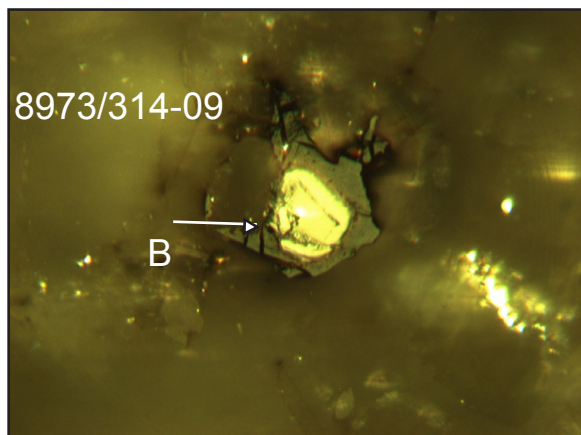
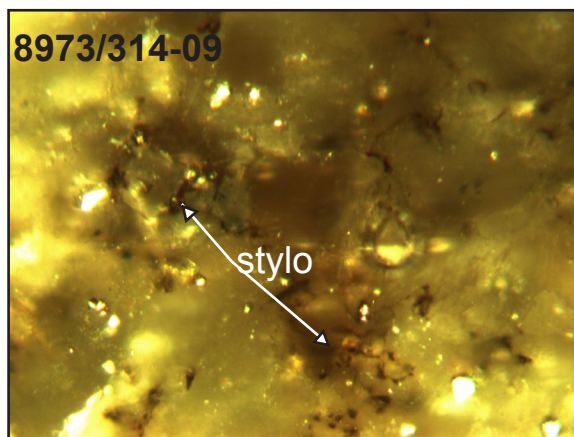
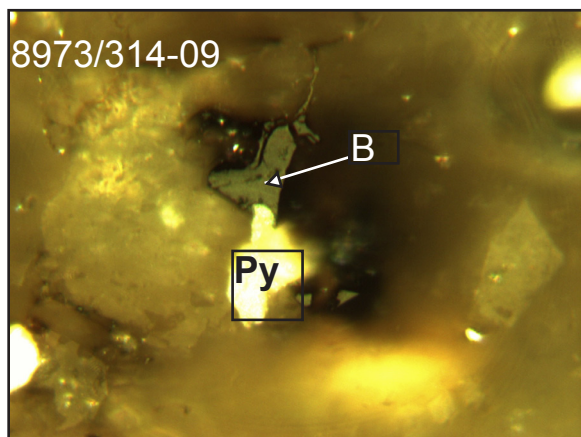




AGS 8964/GSC 313-09 (Montney; 100/01-14-075-11W6/00, 2477.5m core depth). Organic-rich and pyrite-rich (Py), black shale with a major amount of orange fluorescing alginite and a minor amount of measureable small vitrinite (V) and bitumen (B) lenses. Mostly comprised of stylocumulates, amorphous kerogen (am) with a major amount of yellow-orange fluorescing Prasinophyte (P) alginite and rare acanthomorphic acritarch (ac) inclusions between the intergranular pores of a carbonate matrix. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification).







AGS 8973/GSC 8973/314-09 (Montney; 100/05-24-068-22W5/00, 1559.2 m core depth). Minor amount of measureable bitumen (B) and coaly lenses with rare stylocomulate (stylo) lenses observed brecciated between carbonate grains and within fractures of a mainly coarse-grained siltstone matrix. Rare fluorescing bitumen lenses and trace chitinous (ch) microfossils possibly from fish remains. Scale bar applies to all images. (In oil, polished surface, fluorescence and reflected white light, 50X magnification). Py = pyrite.



