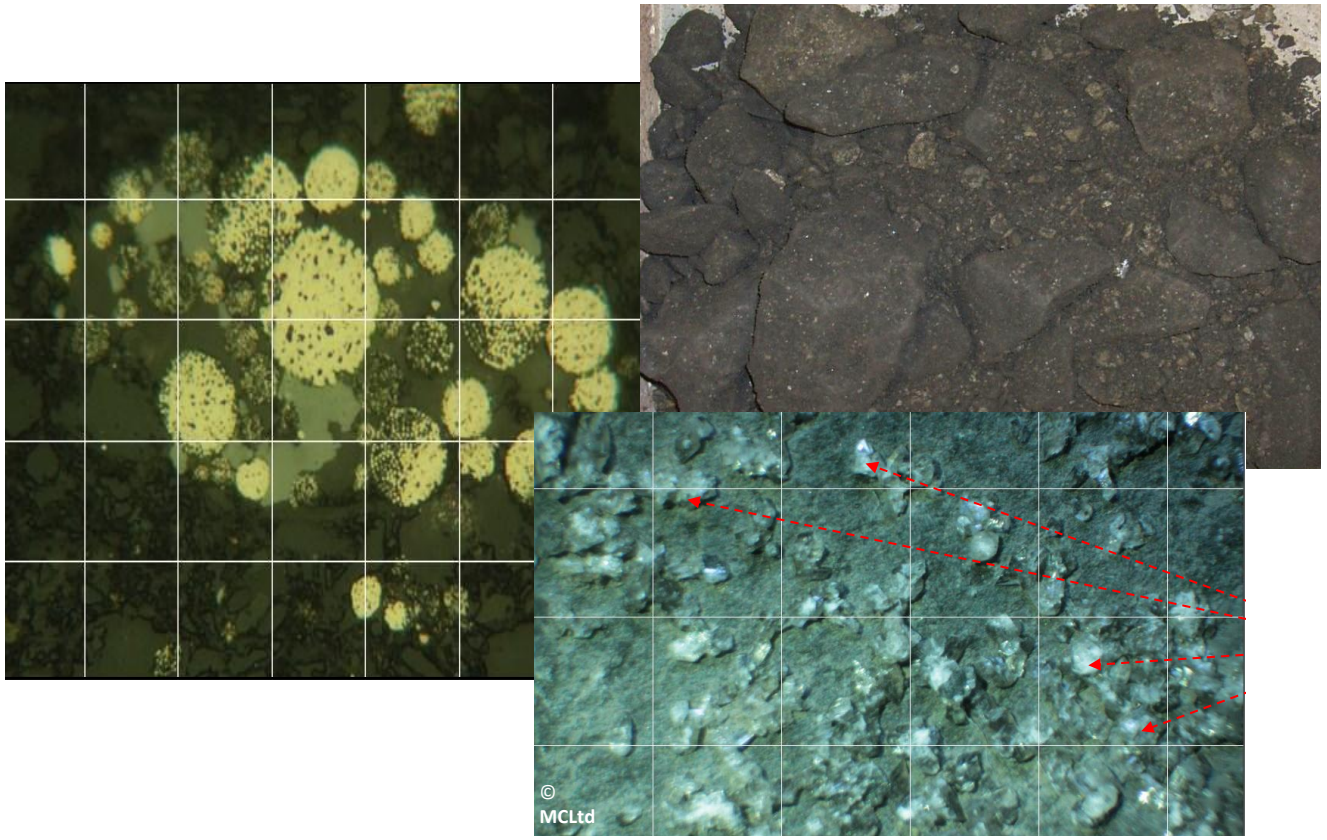
Assessment of Hardcore for Pyrite Induced Heave



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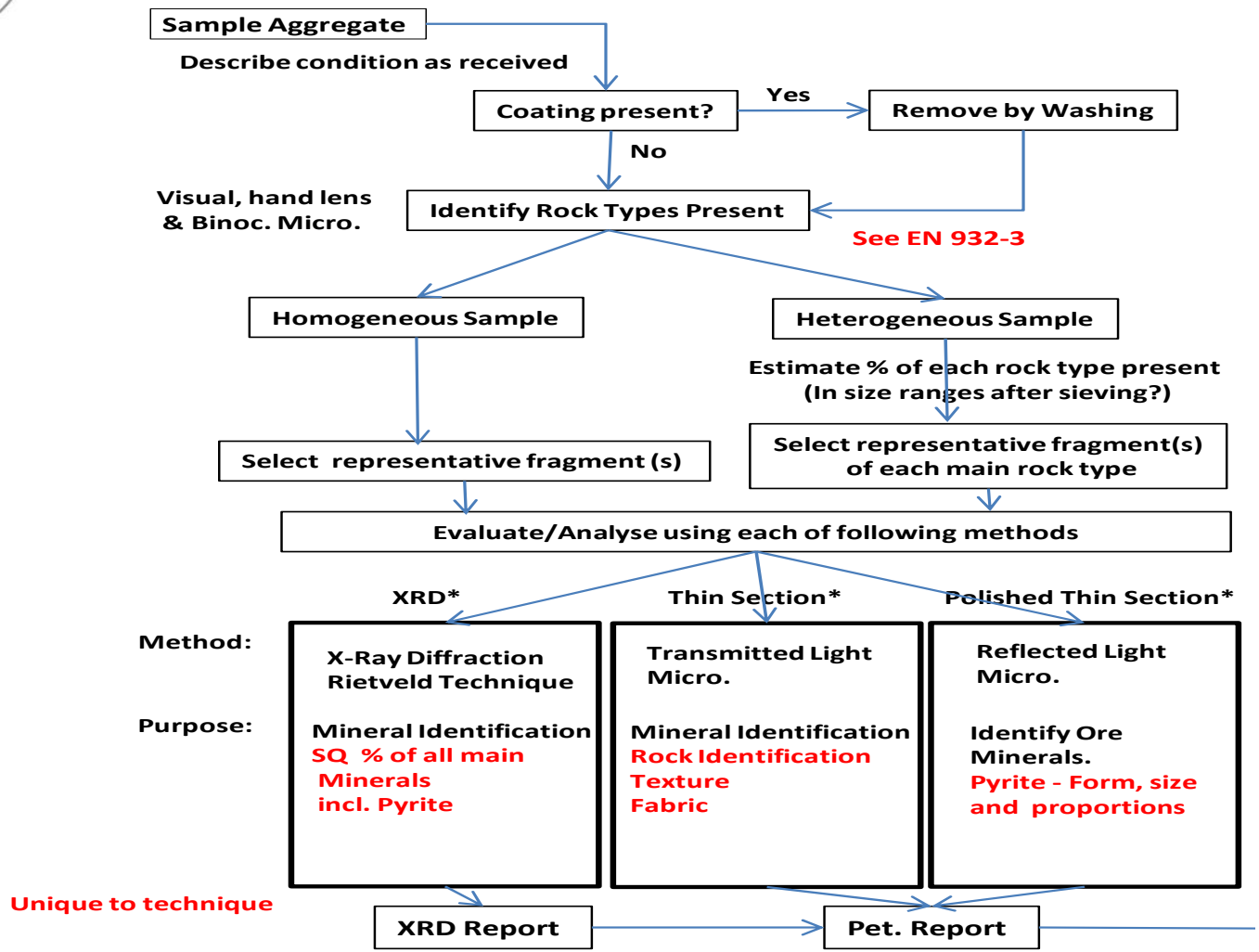
Geological Classification of Hardcore

1. Describe ‘as-received’ sample
2. Remove coatings by washing
3. Identify rock types present & reaction products / precipitation
4. Estimate % of each type
5. Select sample for chemical suite (TS, AS, WSS, $CaCO_3$). Use rifle / quartering or judicious sample selection?
6. Select sample for Petrology & XRD – must be judicious to evaluate the ‘undesirable’ fraction(s)
7. Physical testing to assess durability / soundness of aggregate
8. Evaluate potential for pyrite induced swelling using combined results

Analysis Logic



Images of Hardcore Samples

Hardcore Sample

Thick Coating of Mud/Silt

Remove Coating by Washing

Washed Fragments

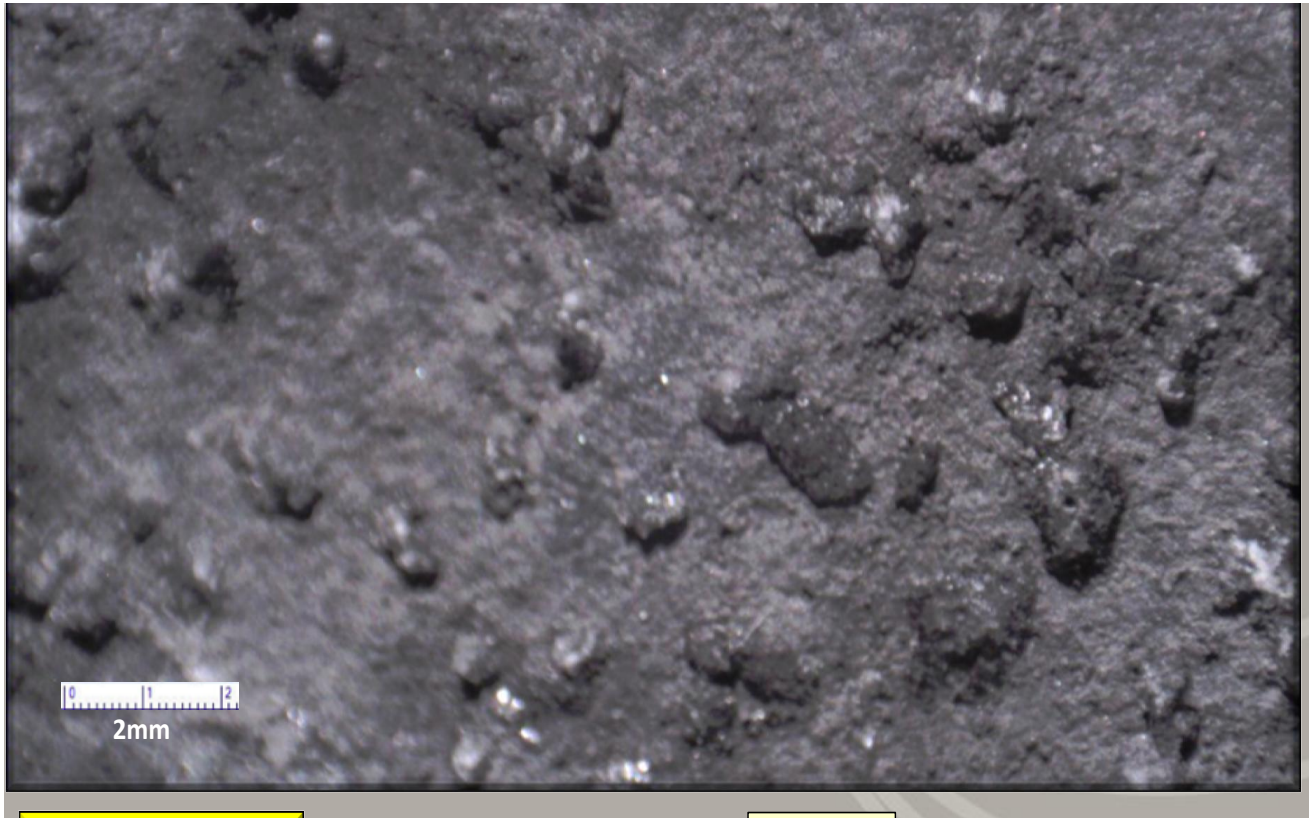
Washed Fragments (>20mm)

Muddy Limestone Fragment

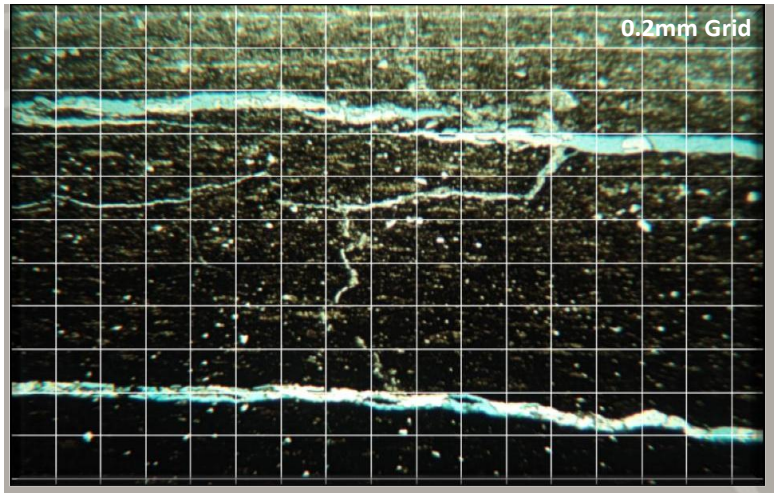
Minerals in Coating and on Fragment Surface

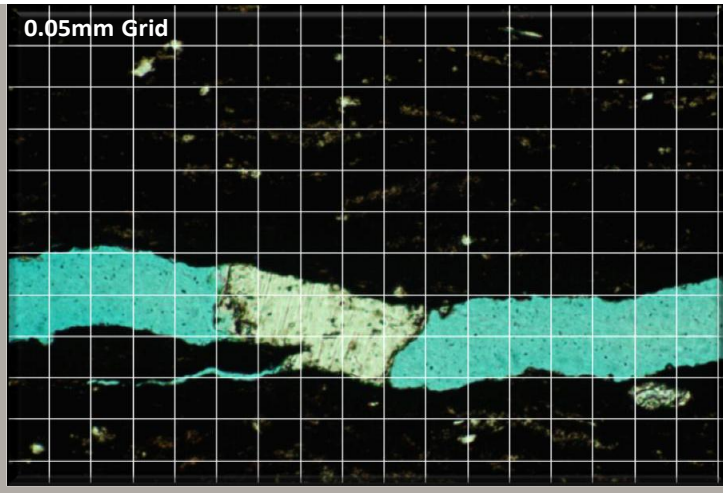
Microscopy Images of Fragment Surfaces

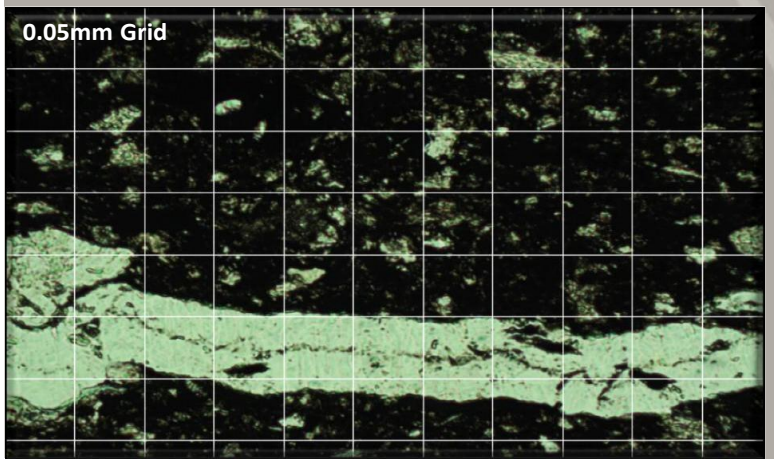
Gypsum on Fragment Surface

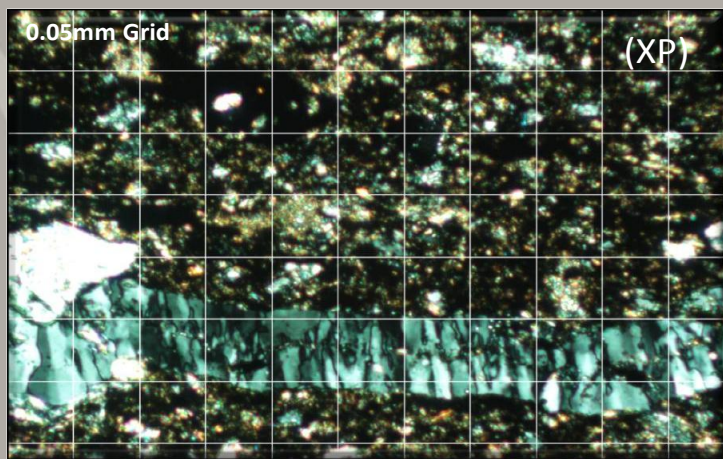


Fractures filled with gypsum

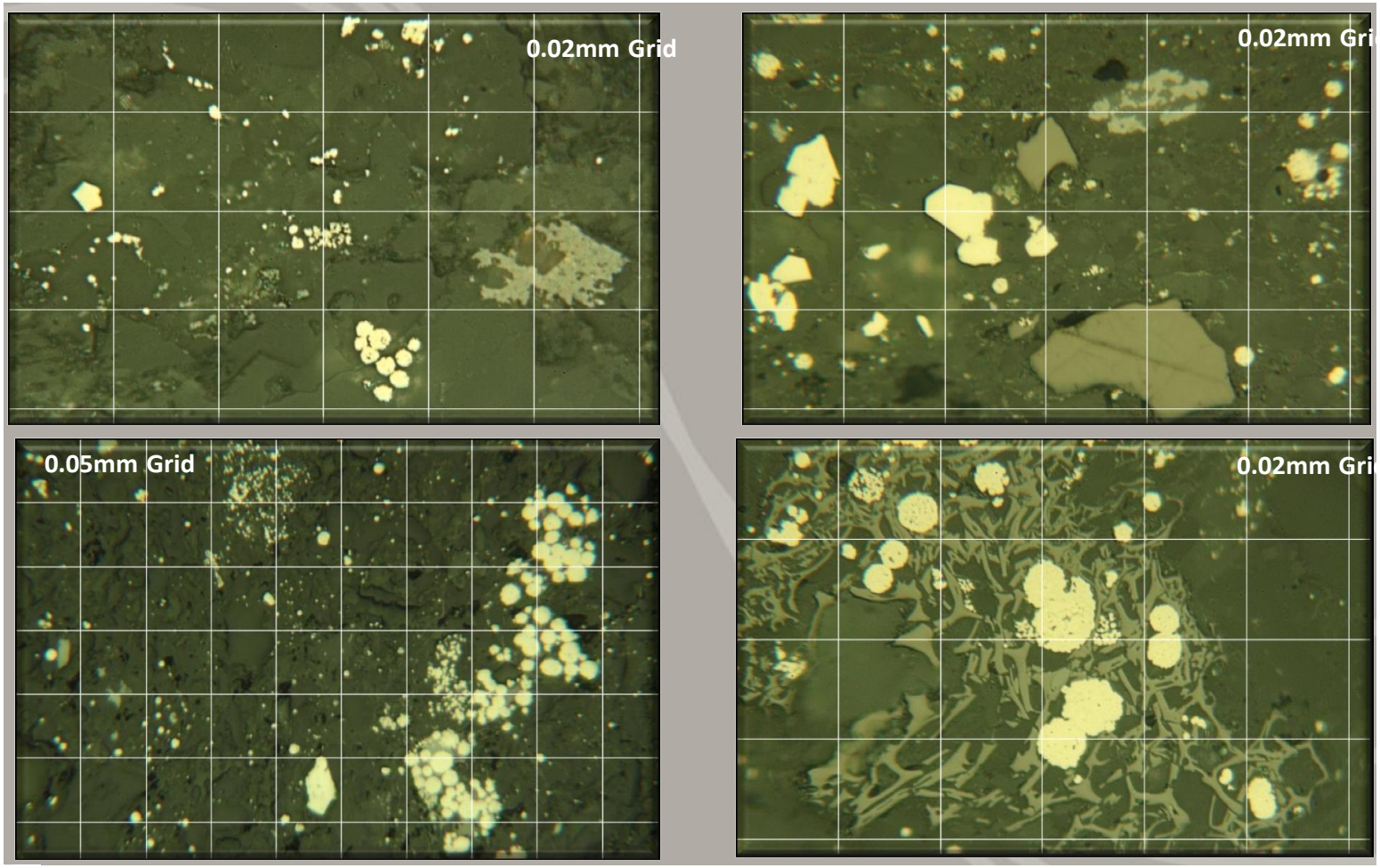




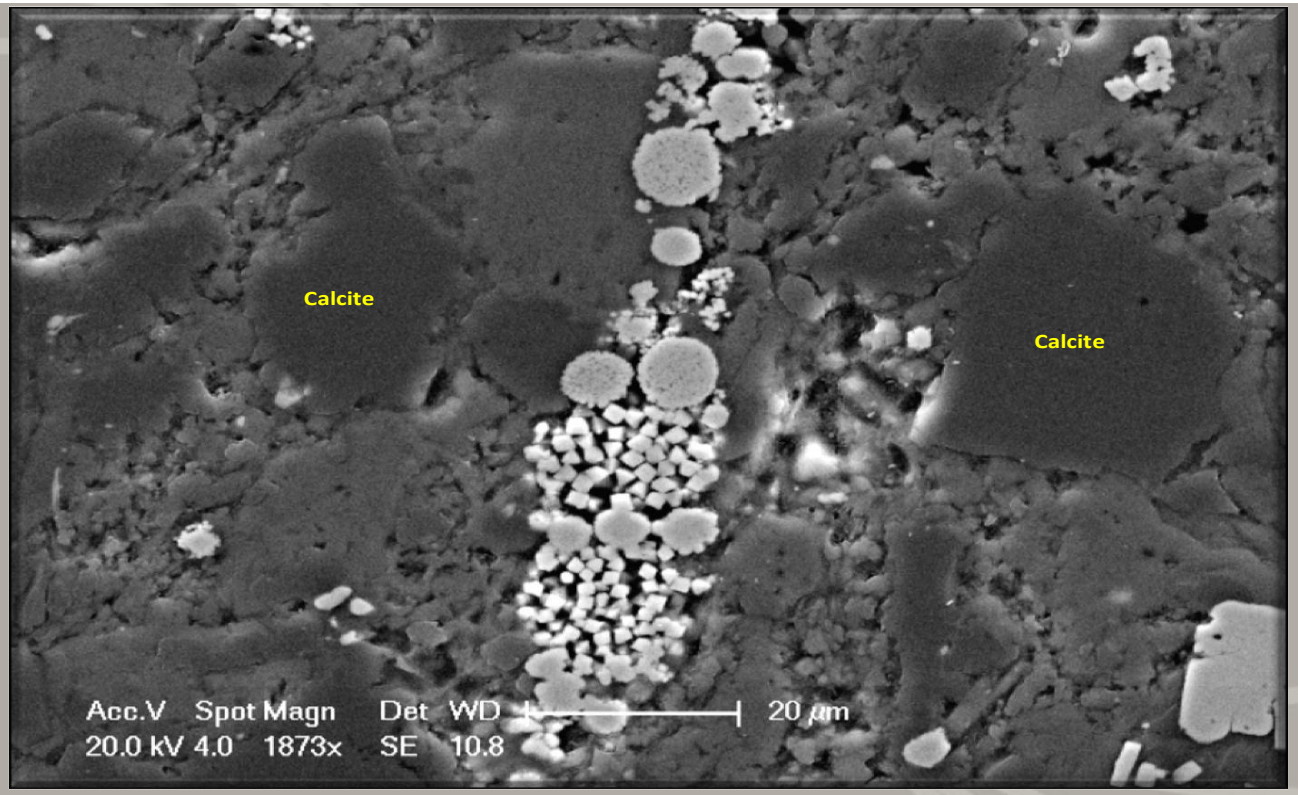




Polished Thin Sections



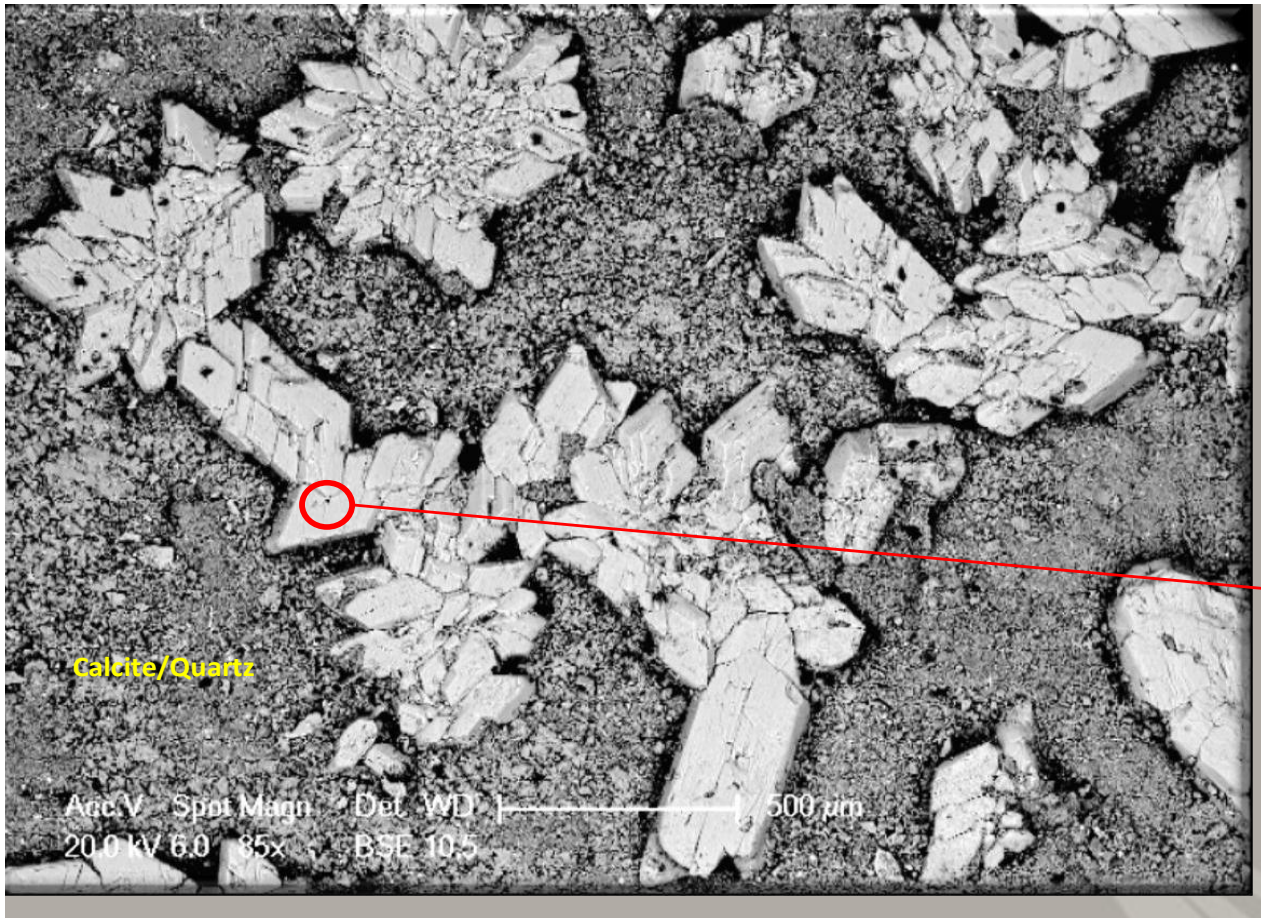
Scanned Electron (SE) Image



Polished Section

Framboidal and Cubic Pyrite within a matrix of Calcite Crystals.

SEM Image & Spot Elemental Composition



Forceful growth of gypsum vein