Does a Good Outcrop Just Stand Out?

Pooling their resources, this team's objective is to answer questions related to basinal tight reservoir facies abundant in Alberta and which hold potentially large oil & gas resources

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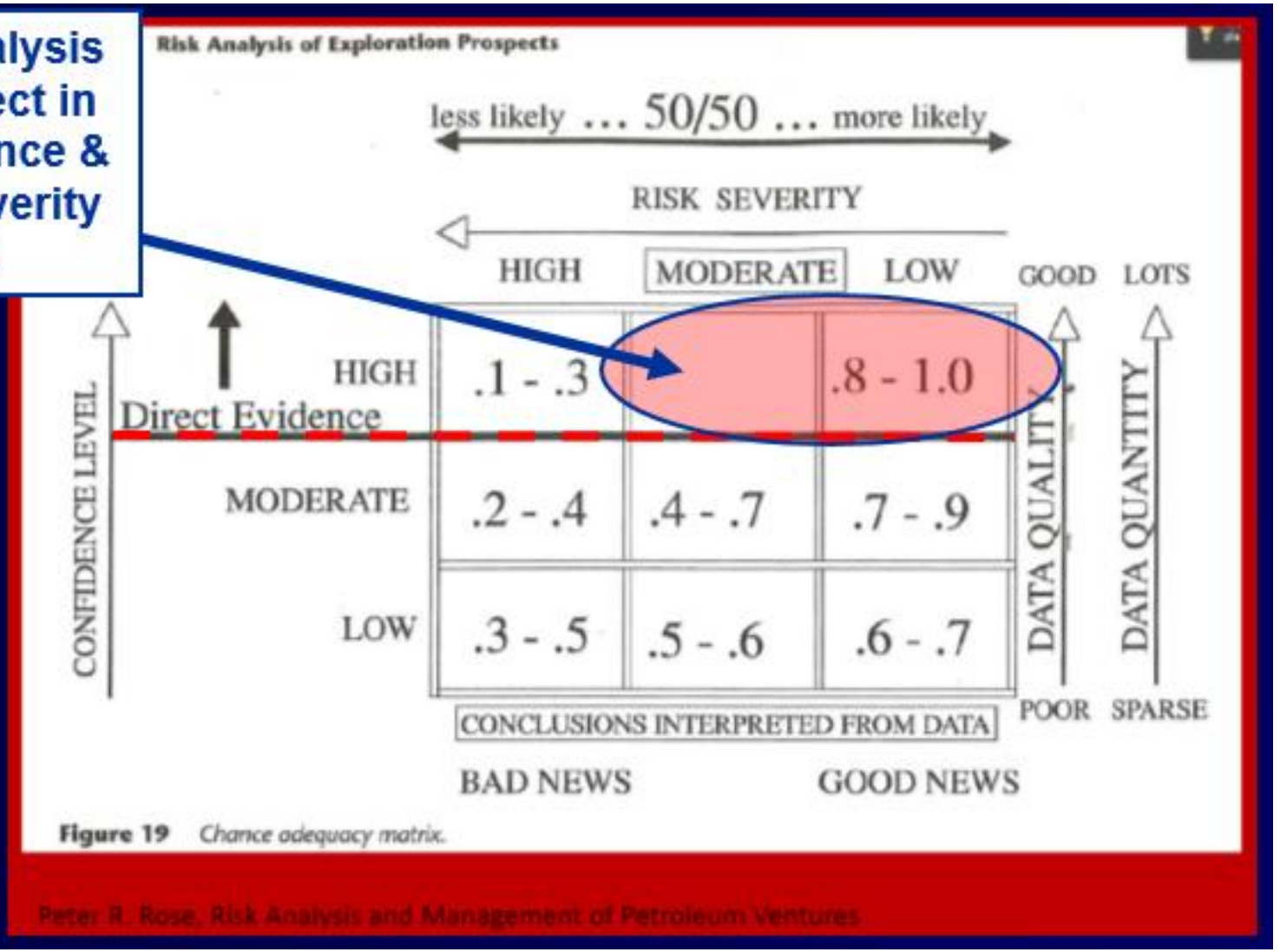
Why Does This Matter?

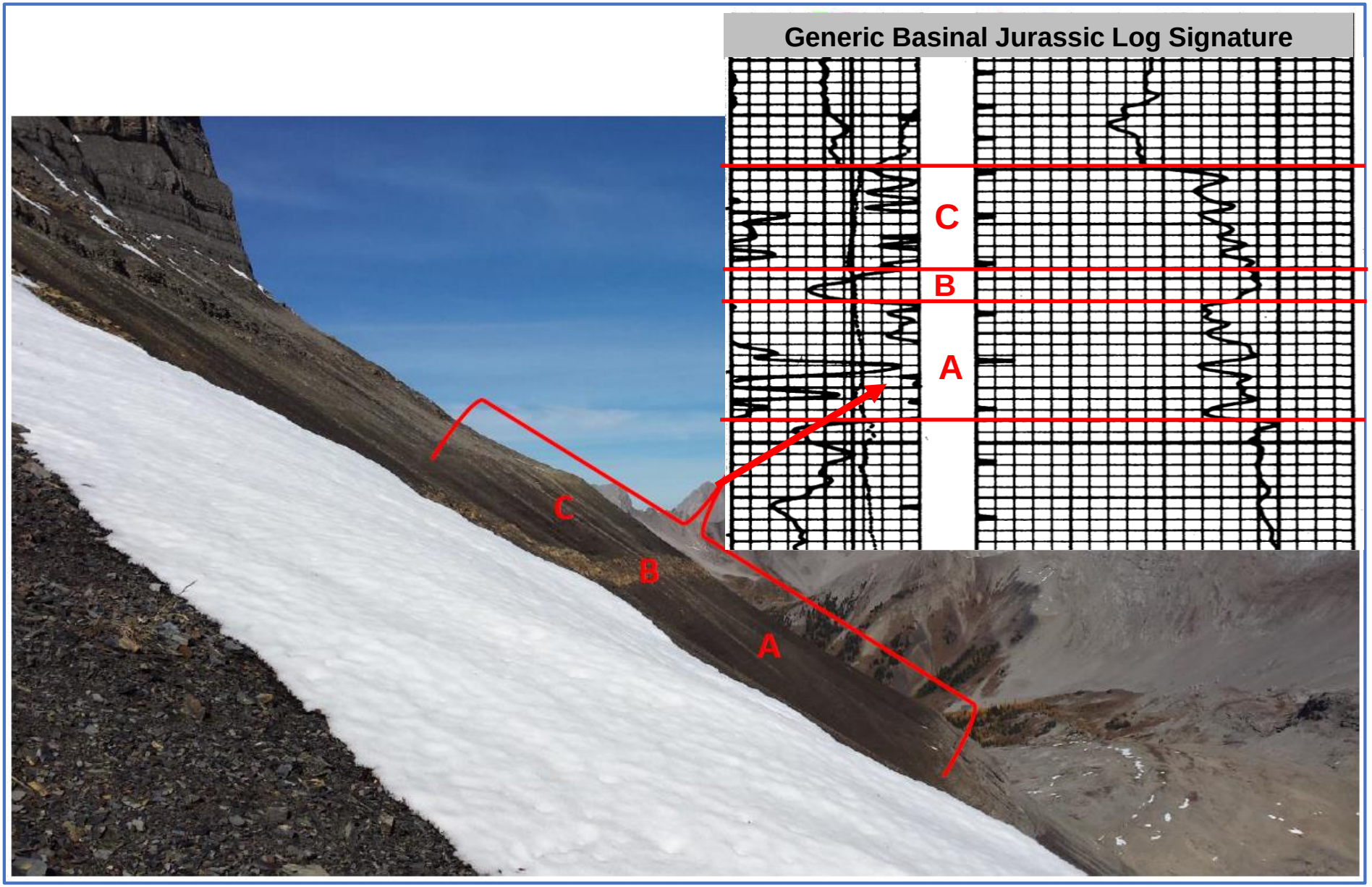
Direct Data Analysis can put Prospect in Higher Confidence & Lower Risk Severity Quadrant



Why Does This Matter?

- Jurassic source rocks have been prolific in other parts of the world
  (Arabian/Iranian basin, Australian Northwest shelf, GOM, northern North Sea, Norwegian shelf, Papua basin, West Siberia, Yemen rift province and more)
- WCSB Jurassic is recognized as an oil and gas source rock
- Why is there a paucity of known Jurassic sourced oil production?
- Where is all the expected oil sitting?
- Was oil expulsion inhibited by vertical and lateral barriers?
- Can it be “entombed” in restricted basinal generative fairways?
- Finding an appropriate outcrop now becomes much more relevant

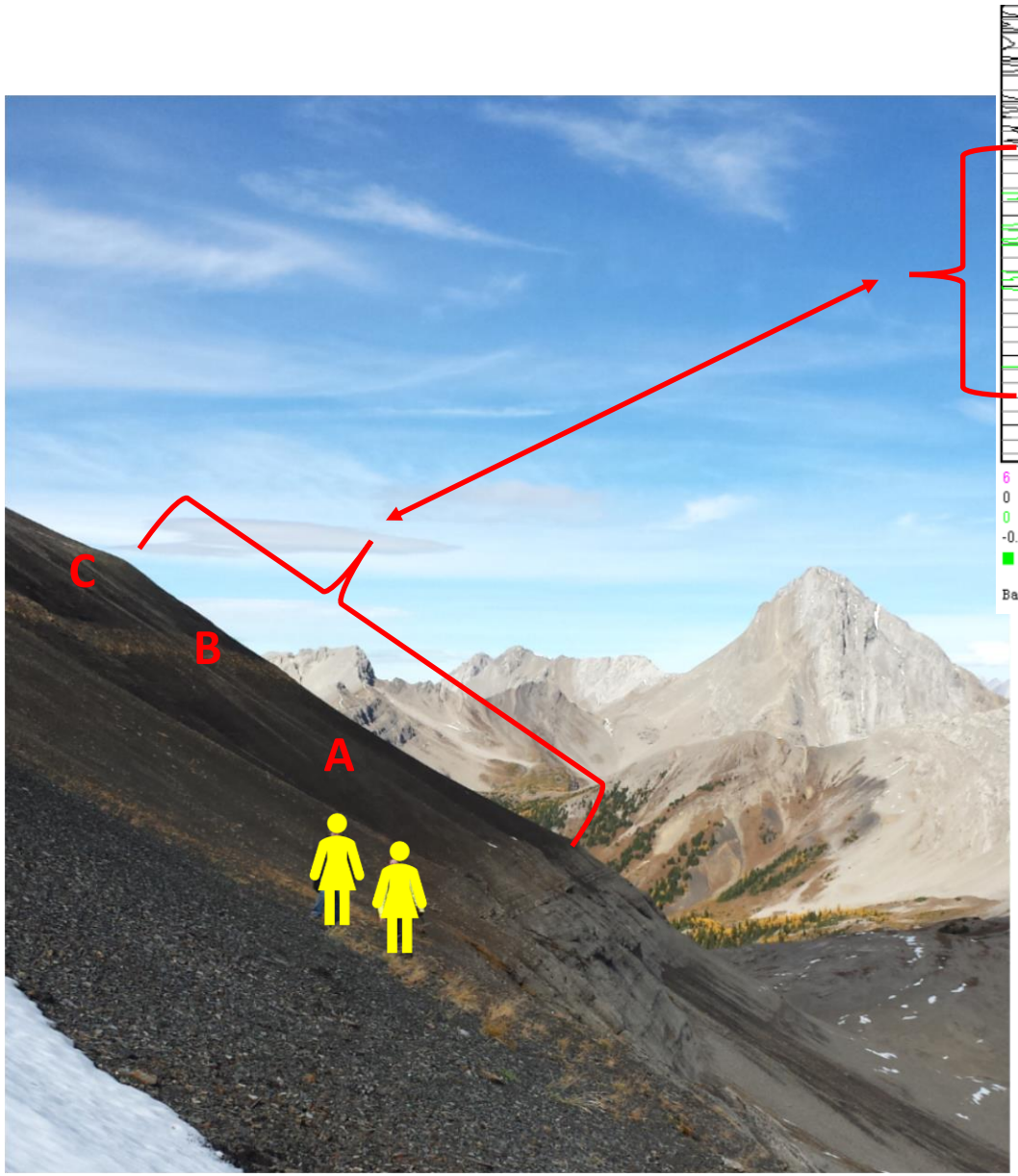
A Representative Outcrop?

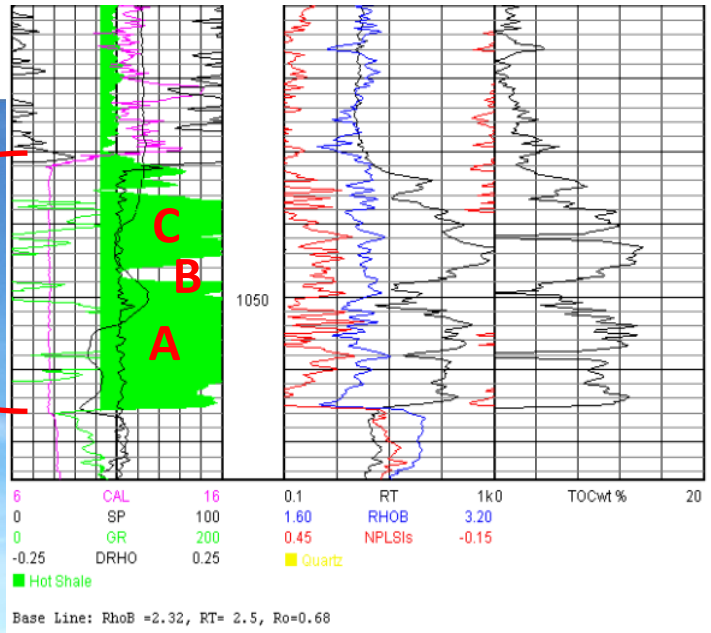


Outcrop Data Gather and Analysis

- Provincial surface sampling permit acquired
- Outcrop Horizons A & C sampled at 75cm (approx.) spacing
- Middle Horizon B sampled at 30cm (approx.) spacing
- Calgary Rock & Materials made cuttings from portion of all outcrop samples
- Geo-Libre, Pro Geo, Calgary Rock & Materials teamed up & pooled expertise:
  - Outcrop analog concept & samples – Geo-Libre Inc.
  - Thin sections & XRD – Calgary Rock & Materials
  - Xrf profiling of outcrop powders – Pro Geo Lab & Analytics
  - Leco TOC & Rock-Eval outsourcing – Pro Geo Consultants
- Joint review – Are results adequate to support a Go-Forward Study?

Outcrop Data Compared to Basin Well Logs





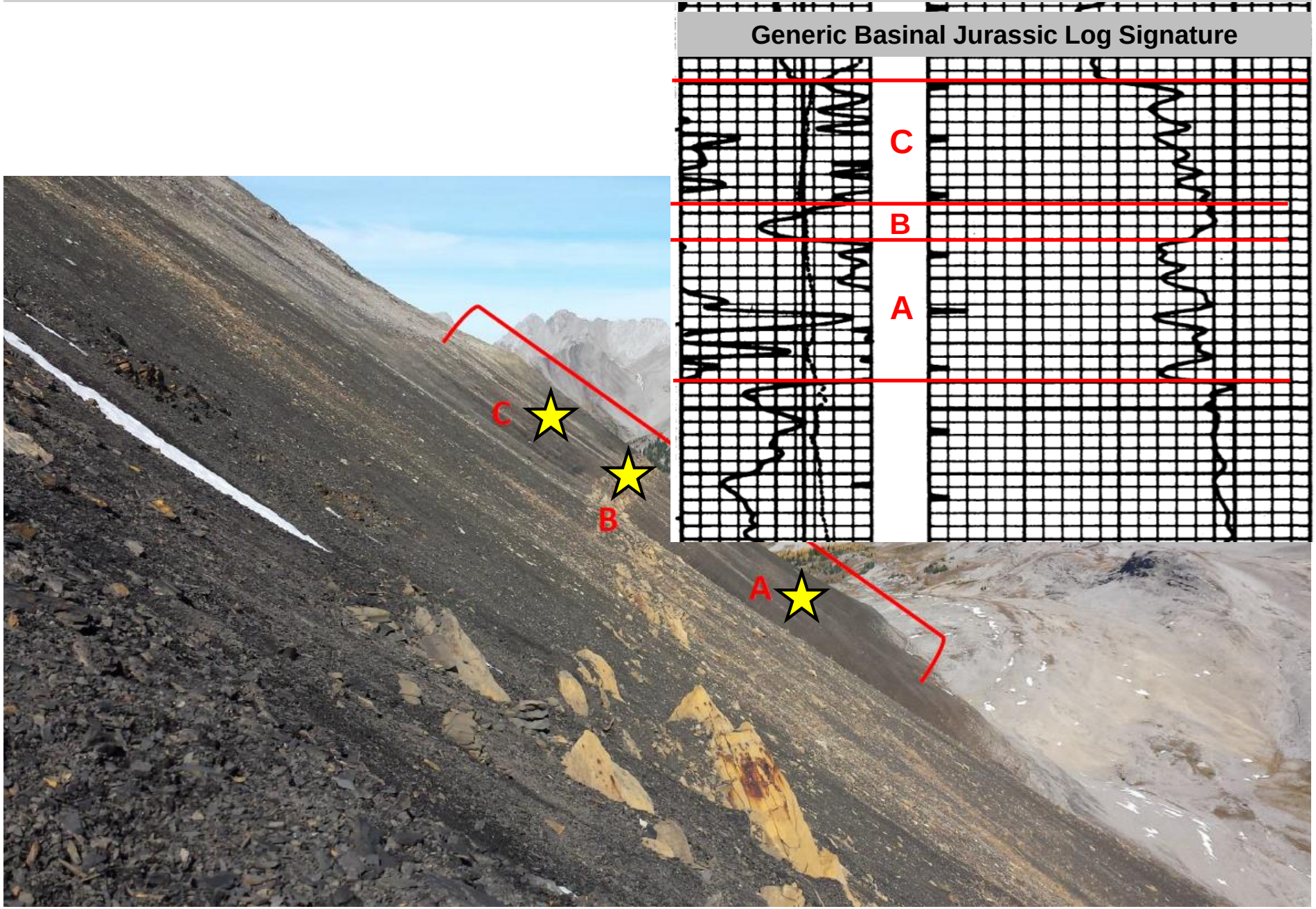
Hot Shale GR > 175

Typically High TOC (4 -12%)
In Upper C & Lower A Horizons

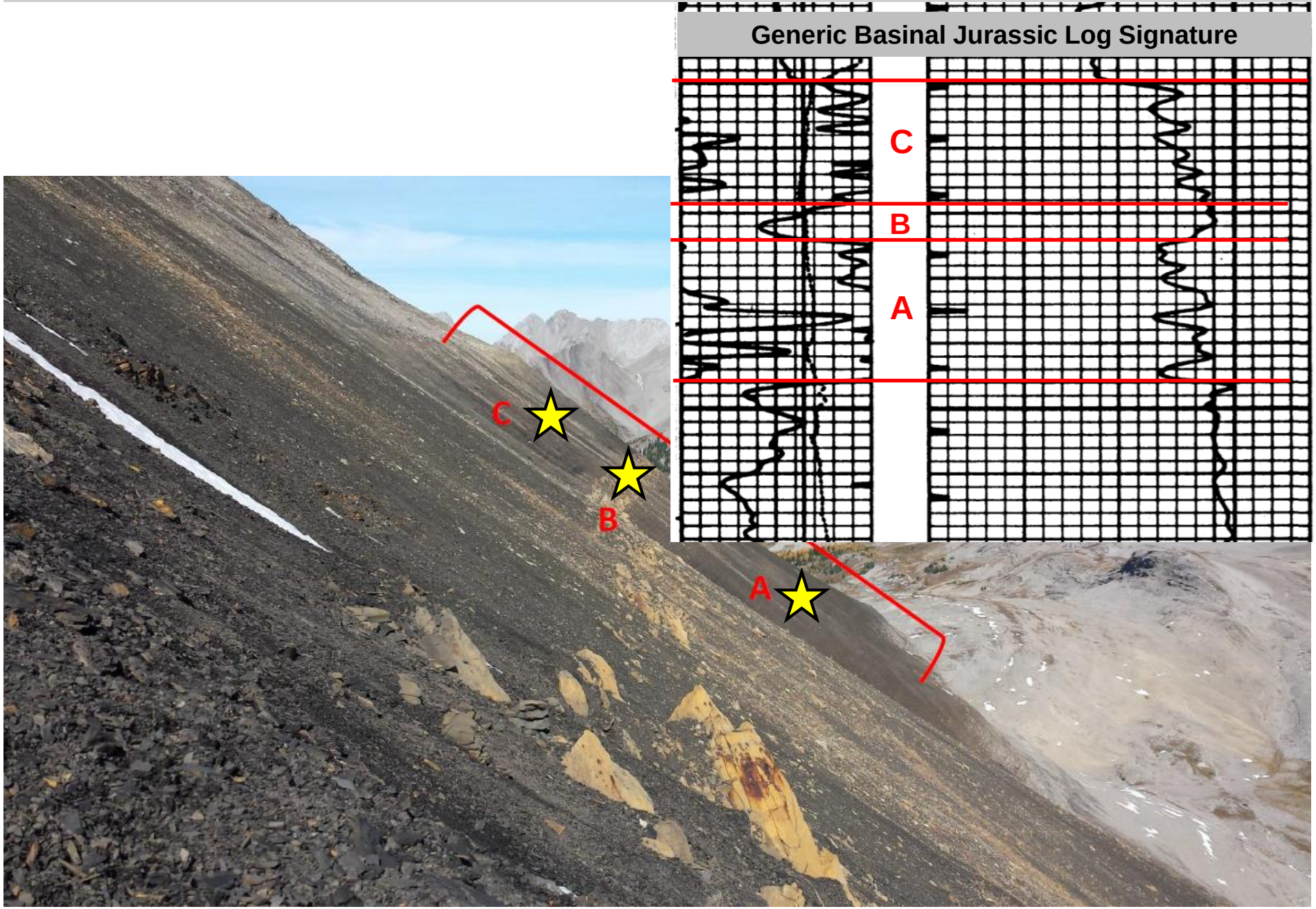
Lower GR & TOC across B Horizon

Low calculated SW

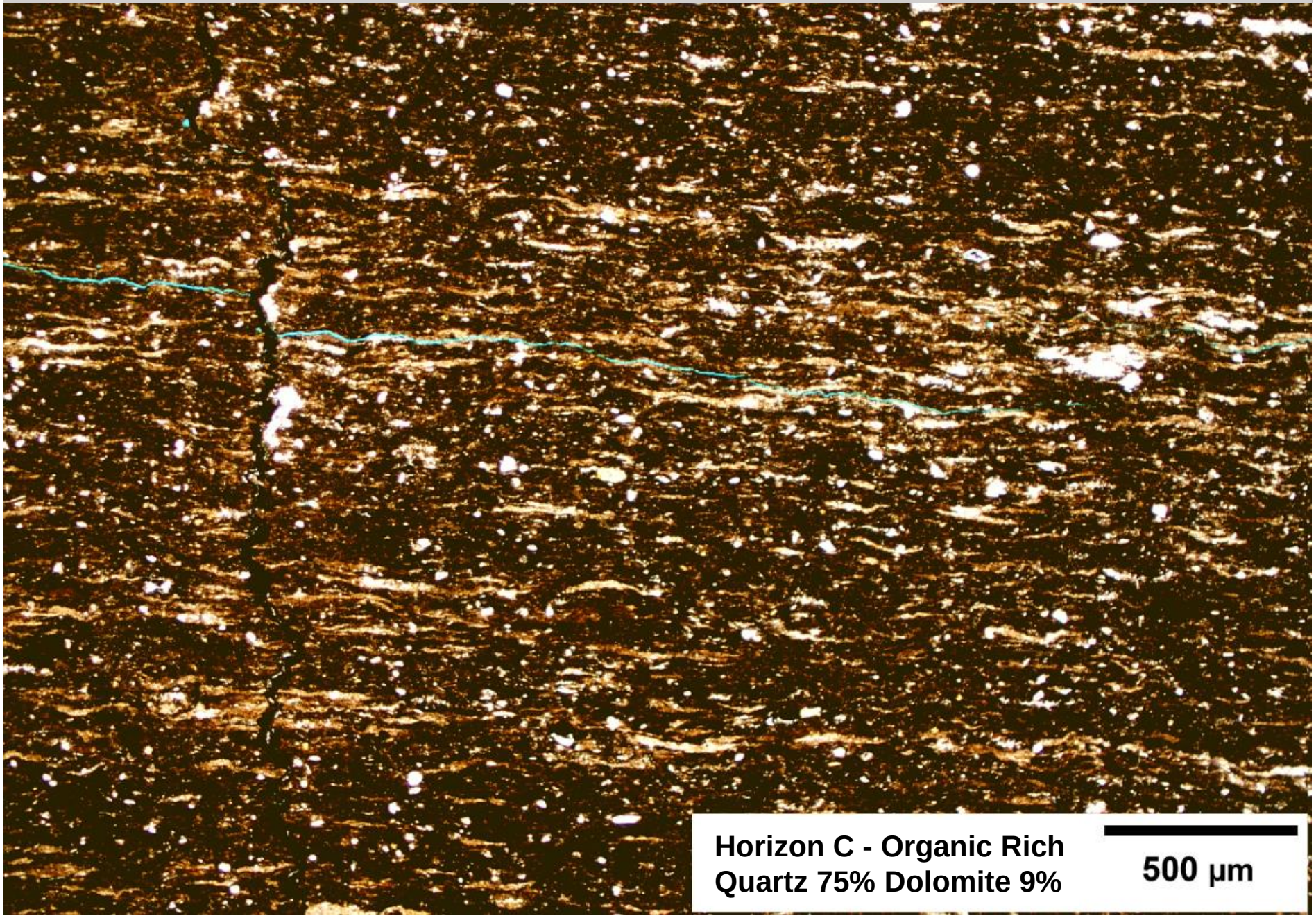
Outcrop Xrd



Outcrop Thin Sections

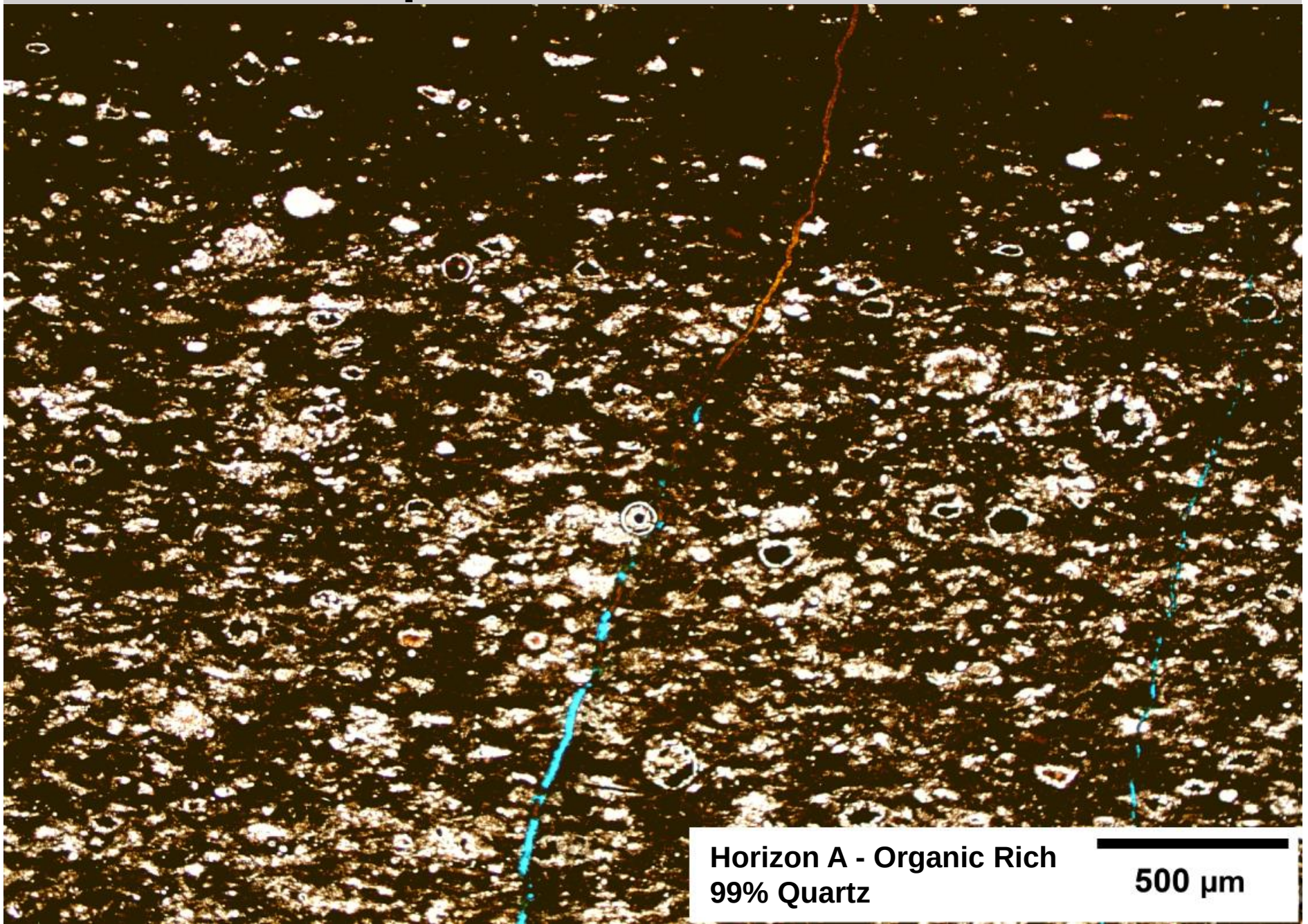


Outcrop Thin Sections - Horizon C



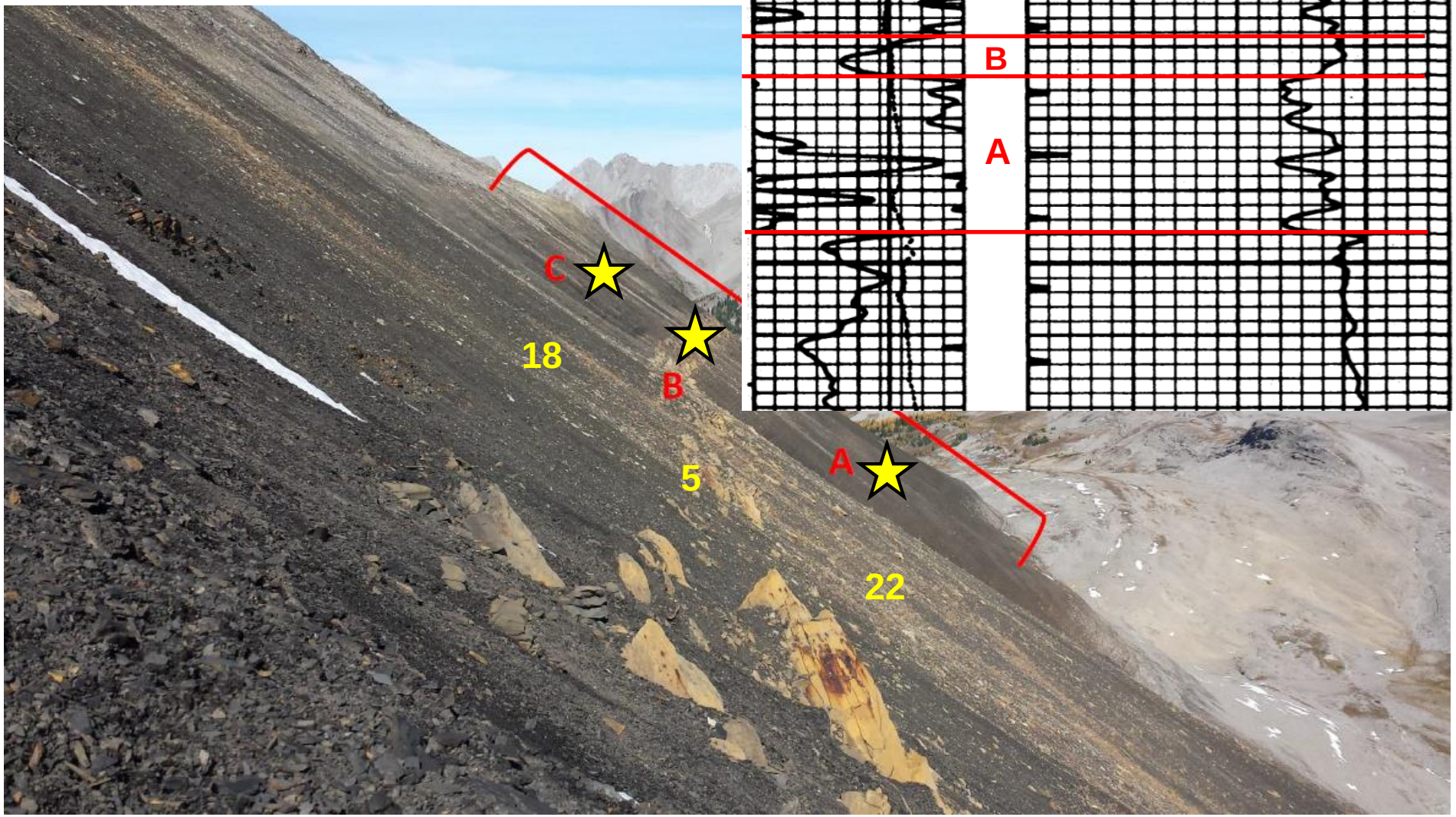
Outcrop Thin Sections - Horizon B

Outcrop Thin Sections - Horizon A

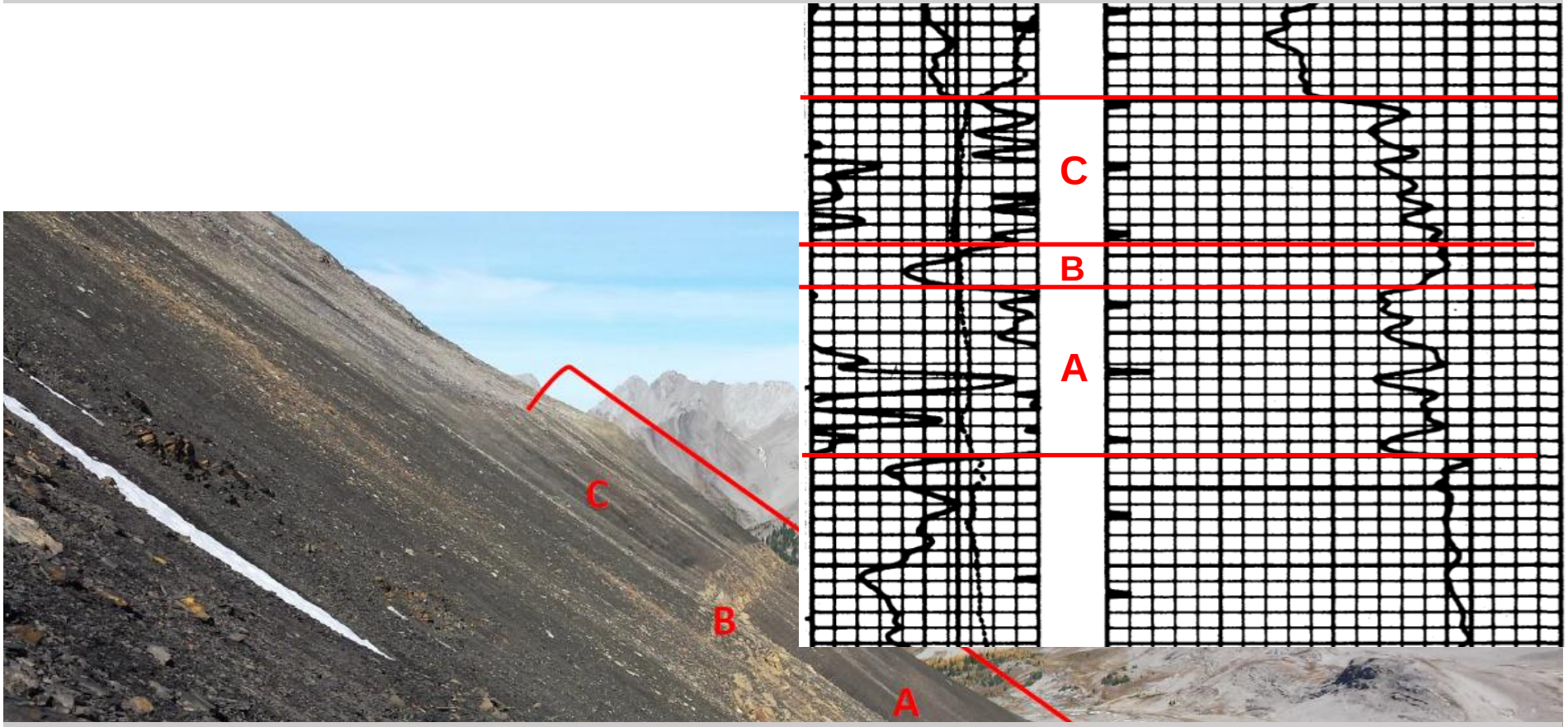


Outcrop Xrf

Sampling rate:
18 across C horizon (75cm approx.)
5 across B horizon A (30cm approx.)
22 across A horizon (75cm approx.)



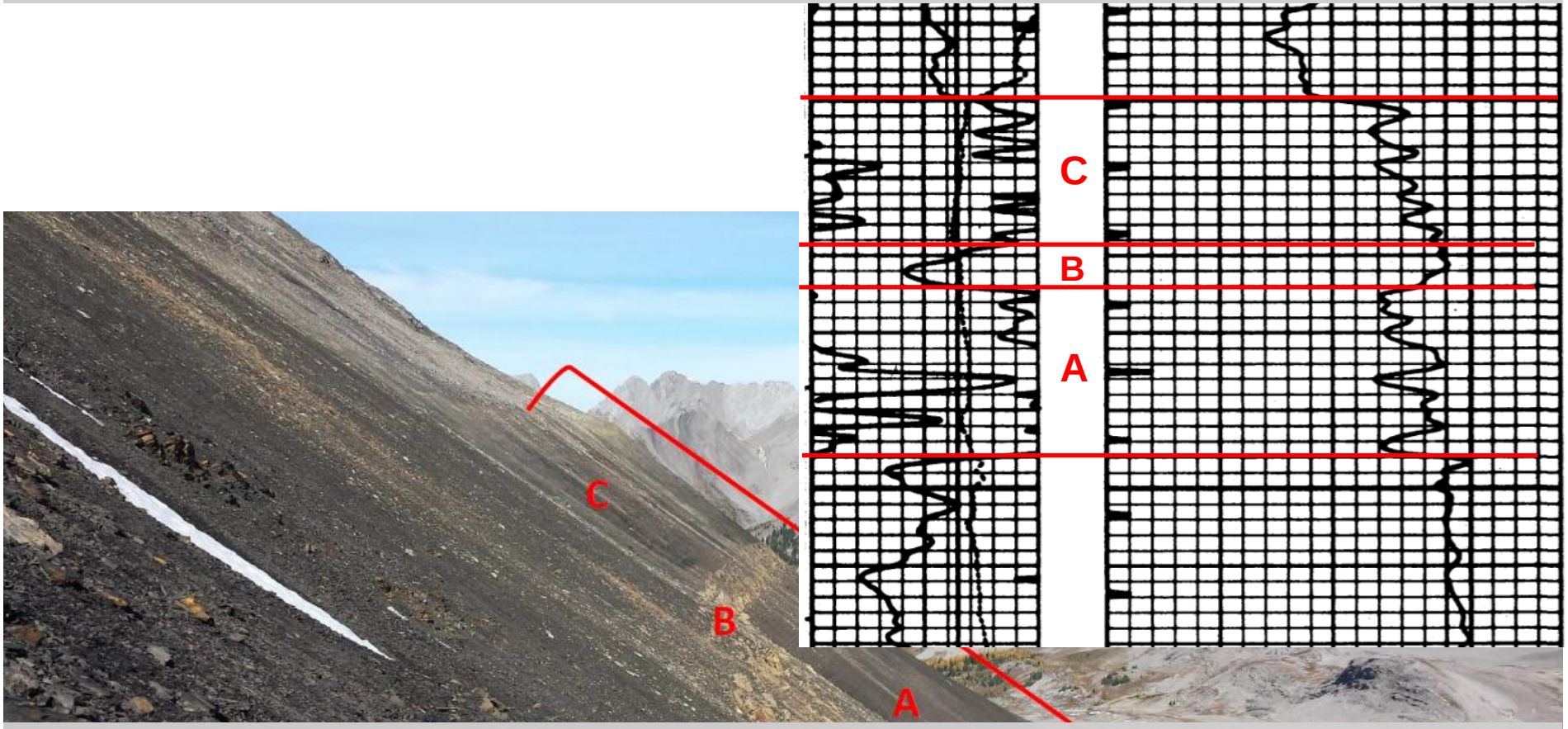
Post-Analysis Observation



- Tmax values (Rock Eval) suggest the outcrop has Metasomatic overprint

  Metasomatic replacement occurs when a mineralizing solution encounters minerals unstable in its presence. The original mineral is dissolved and almost simultaneously exchanged for another along conduits through which hydrothermal solutions flowed
- Enrichment in Quartz across both Horizons A, B and C support hydrothermal alteration associated with Tmax values recorded
- TOC readings and sedimentary fabric signatures were preserved

Results Support Further Team Effort



- Geo-Libre, Pro Geo and Calgary Rock & Materials working on more in-depth outcrop samples analysis
- Outcrop analysis results significant in better understanding Jurassic source rocks
- Team intends to tie it back to specific oil-prone play fairway
- Results planned to be offered as client based report

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Thank You!

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